

SUBJECT: Logging Operations (29 CFR 1910.266), Inspection Procedures and Interpretive Guidance.

Purpose: This instruction establishes policies and provides clarification to ensure uniform enforcement of the Logging Operations Standard (1910.266).

Scope: This instruction applies OSHA-wide.

References:

1. Federal OSHA Instruction CPL 02-01-019 [CPL 2-1.19], "Logging Operations, Inspection Procedures and Interpretive Guidance," dated March 17, 1995.
2. Federal OSHA Instruction CPL 02-01-022 [CPL 2-1.22], "Logging Operations, Inspection Procedures and Interpretive Guidance Including Twelve Previously Stayed Provisions," dated September 27, 1996.
3. 29 CFR 1910.95, 1910.106, 1910.109, 1910.132, 1910.133, 1910.135, 1910.147, 1910.155, 1910.156, 1910.157, 1910.211, 1910.212, 1910.261, 1910.265, 1910.266, 1910.269, and 1928.21 are referenced in this instruction.

Cancellation: This instruction cancels MNOSHA Instruction CPL 2-1.19, Logging Operations, dated February 14, 2008

Background: The former Pulpwood Logging Standard applied only to the harvesting of trees to be used for pulpwood. The Logging Operations Standard, adopted by MNOSHA on March 13, 1995, expands coverage to provide protection for all employees engaged in a logging activity, regardless of the end use of the wood (e.g., saw logs, veneer bolts, pulpwood, or chips).

1. The Logging Operations standard includes various requirements for the provision, inspection and maintenance of equipment (e.g., personal protective equipment, tools, vehicles, and machines) used in performing logging operations. The standard incorporates performance requirements that provide flexibility to employers in developing safety and health programs to suit logging operations in all regions of the country. The standard also requires employers to provide training for each employee who has not been trained previously.
2. The employer is responsible for ensuring that employees can properly and safely perform the work tasks and properly and safely operate the tools, equipment, machines and vehicles used in their jobs.
3. The standard requires employers to maintain certification of training which indicates the date training was completed or, in the case of previously trained employees, the date on which the employer determined that prior training was adequate. In addition, the standard requires each logging employee to have current first aid and CPR training (e.g., certificate).
4. The Logging Operations standard addresses hazards unique to logging operations in addition to hazards covered by other 29 CFR Part 1910 General Industry standards. It

strengthened and clarified the requirements of the previous standard. Compliance with this standard will significantly decrease the number of injuries and fatalities resulting from logging operations.

5. Many of the requirements included in the standard have been directed at the most hazardous logging operations such as felling, limbing, bucking and yarding. OMT Directors/Supervisors shall assure that inspections focus on these high hazard operations, giving particular attention to observing whether safe work practices are being followed in these operations.

Definitions: Clarification of definitions found in Paragraph (c):

1. Logging Operations. This definition has been revised to clarify that "marking," as covered by the final rule, includes only marking that is done attendant to and at the same time as felling, cutting and moving trees in a particular logging work site. Some marking operations include marking danger trees and sizing and marking felled trees to be cut to length. These particular marking operations inform loggers working in the area or on the tract whether and how to cut trees.
 - (a) Marking activities which take place in advance of and separate from the tree harvesting are not covered by the final logging rule. Incidental marking of danger trees or wildlife trees at the same time tracts of land are being marked also is not covered by the final rule because no tree harvesting is undertaken in the area at this time. These preparatory activities do not involve the hazards associated with logging operations.
 - (b) OSHA has revised the definition of logging operation to express more accurately its intention that logging operations cover the transportation of machines, equipment and personnel between as well as to and from logging sites.
2. Machine. Airplanes or helicopters are not machines covered by the new Logging Operations standard.
3. Vehicle. Vehicles covered by the final rule include only those cars, buses, trucks, trailers, or semi-trailers owned, leased or rented by the employer and used for transportation of employees or movement of materials.

ACTION:

- A. Application. The standard applies to all logging operations where trees are harvested regardless of the end use of the wood. Logging operations include, but are not limited to, the operations of marking (i.e., marking danger trees in areas being harvested and marking felled trees to be cut to length), debarking, yarding, chipping, felling, limbing, bucking, loading and unloading equipment and personnel to, from and between logging sites, and other operations associated with felling trees and moving logs from the stump to the point of delivery.

The Logging Operations standard does not cover the construction or use of cable yarding systems or the construction of roads or trails to logging sites. In addition, line-clearing tree trimming operations conducted by a utility company for the purpose of installing poles, etc., are

covered by the Telecommunications Standard at 1910.268 and/or the Electric Power Generation and Transmission Standard at 1910.269(r).

- B. OSHI Safety. OSHIs shall become familiar with the work activities in progress at the logging site and take necessary precautions for personal protection, including observing the standard's restrictions governing proximity to manual or mechanical felling operations. No enforcement action, or accident investigation, is so important as to place the life or health of the OSHI in danger.
- C. Effective Dates. The Logging Operations standard went into effect in Minnesota on March 13, 1995, with the exception of twelve provisions which were stayed until September 8, 1995. All provisions of the Logging Operations standard are now in effect.
- D. General Inspection Procedures.

[NOTE: Not all provisions and paragraphs are included in this directive. Refer to the standard and its preamble published in the *Federal Register* on October 12, 1994, and the notice correcting and amending the final rule published on September 8, 1995, for further guidance on specific subjects and on additional topics not covered here.]

The OSHI shall determine whether the following items are in compliance with the revised standard:

- 1. Paragraph (d)(1) - Personal Protective Equipment. The OSHI shall determine through employer/employee interviews whether the employer is providing, at no cost to the employee, personal protective equipment which meets the requirements of this section.

The final rule requires that the employer provide, at no cost to the employee, appropriate eye, face, head, hand and leg protection. The employer must assure that all PPE provided by the employer is worn by employees and is in serviceable condition and meets the requirements of paragraph (d).

- a. Serviceability of PPE. The employer must assure that all personal protective equipment, including any PPE provided by an employee, is maintained in a "serviceable condition" and is inspected before initial use during a workshift. **If personal protective equipment is not used during a workshift, it does not need to be inspected.** The employer may delegate the tasks of maintenance and inspection to the employee who uses the personal protective equipment, but ultimately the employer remains responsible. Employers may fulfill their obligation of assuring that PPE is maintained and inspected by informing employees of the maintenance and inspection procedures during training, reinforcing the requirements during regular safety and health meetings, and conducting spot checks of employees who use personal protective equipment. A written record of inspections is not required.

Protective material may be damaged or destroyed in the course of work (e.g., while stopping a chain saw). When only the outer covers of the protective equipment have been penetrated, it does not necessarily mean that the

equipment is no longer serviceable. However, where there are also cuts or tears in the protective material of the logging boot or leg protection, such equipment is no longer in serviceable condition. Such cuts and tears in the protective material compromise the ability of the PPE to provide the level of protection which is necessary. In situations where footwear and leg protection cannot be repaired it must be replaced with PPE which is serviceable.

- b. Paragraph (d)(1)(iii) - Gloves. Employees handling wire rope may wear any type of gloves or hand protection as long as it provides adequate protection against puncture wounds, cuts and lacerations.

- c. Paragraph (d)(1)(iv) - Leg Protection. Employees must use leg protection constructed of cut-resistant material any time they operate a chain saw. Chain-saw kickback and sudden cut-through, which are major causes of chain-saw injuries, are not dependent on whether the chain saw is used frequently or regularly by the operator. OSHA believes that a feller, who operates a chain saw as a regular part of the job, and a logging truck operator, who may operate a chain saw occasionally or incidentally to operating a vehicle, both face a significant risk of injury when using a chain saw. As such, leg and foot protection are required whenever an employee is operating a chain saw.
 - (1) The OSHI shall determine whether the employer has provided, at no cost to employees operating chain saws, leg protection specified in (d)(1)(iv).
 - (2) The OSHI shall determine whether each employee using a chain-saw is wearing leg protection while operating a chain-saw. This requirement applies to any employee who uses a chain saw, no matter what length of time the employee operates it. For example, a machine operator waiting for a load of logs, who bucks or limbs a log with a chain saw, must use leg protection.
 - (3) The OSHI shall ascertain whether employees who are working as climbers are wearing leg protection or whether the employer has demonstrated that a greater hazard is posed by wearing such equipment in the particular situation.
 - (4) The leg protection requirement does not apply to employees operating a chain saw from a vehicular mounted elevating and rotating work platform.

- d. Paragraph (d)(1)(v) - Cut-resistant foot protection. Employers shall assure that foot protection worn by each employee who operates a chain saw, including rubber, caulk-soled and other slip-resistant boots, is chain-saw cut-resistant.
 - (1) Material is deemed to be "chain-saw cut-resistant" if it either provides enough resistance to give the employee time to react before the chain saw cuts through the boot material or jams the flywheel and chains, thereby causing the saw to stop.

- (2) The chain-saw cut-resistant foot protection requirement applies to all employees who operate a chain saw as a regular part of the employee's job as well as incidental to the job. Based upon the hazards to employees when they use a chain saw, OSHA requires that all employees who use a chain saw be protected against foot injury, regardless of the frequency of chain saw usage.
- (3) The foot protection requirement is expressed in performance terms. Nothing in the final rule requires a specific type of construction of protective footwear, such as steel-toed logging boots. Steel-toed boots meeting the foot protection requirements of 1910.136. However, if the logging boots do not have material to protect the rest of the foot from the chain-saw cuts, they do not comply with the final rule. The final rule requires that logging boots for chain-saw operators provide cut-resistant protection for the foot, not just the toe. Employees are free to use foot protection constructed with other cut-resistant material to protect against chain saw cuts.

The OSHI shall determine whether each employee using a chain-saw is wearing chain saw cut resistant foot protection while operating a chain-saw.

- e. Paragraph (d)(1)(vii) - Eye and Face protection. The employer must assure that each employee who is at risk of eye and face injury wears protection meeting the requirements of Subpart I of Part 1910. For example, some employees (e.g., machine maintenance employees), may only need eye protection to guard against injury.

- (1) In other logging operations such as, but not limited to, chipper operations, and cutting limbs, branches and spring poles, face protection must be worn because there is a potential for facial injury (e.g., flying wood, needles, and splinters; cutting limbs and spring poles; moving through dense underbrush). For operations such as chipping, face protection must meet the requirements of Subpart I.
- (2) For chain-saw operations, logger-type mesh face screens may be worn even though most logger-type mesh face screens do not meet the requirements of Subpart I. They do not comply with the referenced ANSI standards, ANSI Z87.1-1989 or ANSI Z87.1-1968 because they are not able to pass the impact and penetration resistance tests required by the ANSI standard. In chain-saw operations, however, there is not the same hazard of objects hitting the face screen at a high speed or penetrating through the mesh openings. Mesh screens provide adequate protection to keep small limbs, branches, and saplings from poking the employee's eye or cutting the employee's face when the employee is moving through the woods, yet do not restrict vision in wet weather or fog up. Face protection comprised of mesh screens is readily available in the industry.
- (3) Where both eye and face protection are necessary, and the employee is

provided with face PPE that protects both eyes and face, the employee is not required to also wear separate eye protection.

2. Paragraph (d)(2) First-Aid kits.

a. Paragraph (d)(2)(i) - Location of first-aid kits. First-aid kits must be located at each active landing and on each employee transport vehicle. First-aid kits also must be readily accessible to each work site where felling, limbing and bucking are being done.

(1) Where one of these cutting worksites is located more than one-half mile, under optimal conditions, from another worksite, landing or employee transport vehicle, a first-aid kit must also be provided at that worksite. In these situations, the first-aid kits which are at the landing, on the vehicle, or at other worksites are too distant to be considered immediately accessible.

(2) Where conditions are not optimal, such as steep or mountainous terrain, very muddy terrain, heavy brush, or snowy and icy conditions, first-aid kits cannot be as far as one-half mile from a cutting area and still be considered immediately accessible. Where such conditions exist or are reasonably anticipated, the employer will have to evaluate their severity in determining whether cutting operations need first-aid kits to be located closer to the worksite.

b. Paragraph (d)(2)(iii) - Review of First-aid kits. Annual review and approval of first-aid kits by a health care provider is permitted but not required by the standard. Each first-aid kit must contain at least the items listed in Appendix A of the Logging Standard, which has also been revised, as discussed below.

c. Appendix A to 1910.266 - First-Aid Kit Contents (mandatory). The final rule specifies the minimum contents of first-aid kits that employers must provide. The minimum content list was developed in conjunction with OSHA's offices of Occupational Medicine and Occupational Health Nursing.

Each kit must contain at least one blanket. Each first-aid kit must contain a splint. Examples of acceptable splints include wire, inflatable and air splints.

3. Paragraph (d)(3) - Seat Belts. The OSHI shall determine whether each vehicle or machine equipped with Rollover Protective Structure/Falling Object Protective Structure (ROPS/FOPS) or overhead guards, including employee-owned vehicles and machines, has seat belts provided for the operator meeting the requirements of the revised standard.

The employer shall assure that each employee uses the available seat belt while the vehicle or machine is being operated. An employer can meet this obligation by informing employees of this requirement during training, reinforcing the requirement during regular safety and health meetings, and conducting spot checks of employees while they are operating vehicles and machines. The OSHI shall determine through employer/employee

interviews whether employees are using seat belts whenever they operate a machine or vehicle.

4. Paragraph (d)(4) - Fire Extinguishers. The OSHI shall determine whether the employer provides and maintains portable fire extinguishers on each machine and vehicle involved in logging operations, during both operation and refueling.
5. Paragraph (d)(5) - Environmental Conditions.
 - a. Work must terminate and employees move to a place of safety when environmental conditions create a hazard for an employee. Hazardous environmental conditions include strong winds which may adversely affect the fall of a tree.
 - b. Fire is also identified as a hazardous environmental condition. However, the standard, read in its entirety, does not require employees to leave the area any time a fire starts. Other requirements of the standard contemplate that an employee may be called upon to put out a fire. However, if a fire were to start in an area where there is no fire extinguisher or other equipment or supplies which allow the employee to safely suppress it, the employer would be responsible for assuring that employees are moved out of the danger area. Likewise, where a fire, because of its size, intensity or the conditions of the area, creates a hazard for an employee who remains in the area, either to work or to attempt to suppress the fire, the employer must also assure that employees are removed from the area of danger instead of trying to extinguish the fire. The standards on fire protection in Subpart L of Part 1910 and not the Logging Operations standard govern the fighting and suppression of fires at logging worksites.
6. Paragraph (d)(6) - Work areas
 - a. Paragraph (d)(6)(iii) - Working within visual or audible contact. This provision applies to each employee working at a logging worksite, including watchmen and other employees performing logging operations at remote logging worksites. The OSHI shall determine whether each employee involved in logging operations works in a position or location that is within visual or audible contact with another employee. The contact requirement applies to each employee working at a logging worksite. Engine noise, such as from chain saws, is not an acceptable means to "maintain contact." This requirement does not apply to vehicle operators who are not at the logging site (i.e., employees driving vehicles such as log transport trucks on public roads), but only to vehicle operators while they are at a logging worksite.

The OSHI shall determine whether hand signals or audible contacts, such as, but not limited to, whistles, horns, or radios, are utilized whenever noise, distance, or other factors prevent clear understanding of normal voice communications between logging operation employees. The OSHI shall also determine whether signals are given only by a designated employee, except in an emergency. A "designated person" is defined as an employee who has the requisite knowledge, training and experience to perform the specified duties.

b. Paragraph (d)(6)(iv) - End of work shift accounting of employees. The employer must account for each employee at the end of each work shift. The employer need not personally conduct the actual end of shift accounting of each employee, but may delegate this task. The employer remains ultimately responsible under the standard for assuring that employees are not inadvertently left in the woods. The OSHI shall determine through employer/employee interviews whether the employer accounts for each employee at the end of each workshift.

c. The standard does not require employers to prohibit employees from remaining at the worksite after the end of the work shift to engage in personal activities, such as hunting, camping, or cutting fire wood for personal use. Rather, OSHA's intent is to assure that no employee, particularly an injured employee, is inadvertently left in the woods without assistance.

After the work shift has ended and the employer has ascertained that the employee is done with work, including overtime work, and is safely accounted for, the standard does not prohibit the employer from allowing employees to remain in the area for personal reasons.

d. Through observation and employer/employee interviews, the OSHI shall determine whether adjacent occupied work areas are spaced at least two tree lengths apart and whether the duties of each employee are organized so the actions of one employee will not cause any other employee to be potentially exposed to logging hazards.

The OSHI shall determine whether a distance of greater than two tree lengths is being maintained between adjacent occupied work areas on slopes.

7. Paragraph (d)(8) - Overhead electric lines. Logging operations near overhead electric lines must comply with the requirements of 29 CFR 1910.333(c)(3).

8. Paragraph (d)(9) - Flammable and Combustible Liquids

a. Paragraph (d)(9)(i) - Storage and handling of flammable and combustible liquids. Flammable and combustible materials must be stored, handled and transported in accordance with the requirements of Subpart H of Part 1910.

Subpart H permits Class IB liquids which OSHA interprets as including chain-saw fuels, to be carried in safety cans approved by Underwriters Laboratories (UL) or Factory Mutual (FM). Safety cans which are permitted under Subpart H are further defined as containers approved by a nationally recognized testing laboratory (NRTL), which do not hold more than five gallons capacity, have a spring-closing lid and spout, and are designed to safely relieve internal pressure when subjected to fire exposure. This definition is broad enough to include plastic safety cans, provided that such containers are approved by a NRTL as meeting the other requirements of the definition.

b. Paragraph (d)(9)(iii) - Machine Fueling. Diesel-powered machines and vehicles

may be fueled while idling, provided that continued operation is intended and that the employer follows safe fueling and operating procedures. OSHA is permitting this exception because the hazard which this provision seeks to address, sudden flash fires, is typically not present during fueling of diesel-powered engines because diesel fuel has a higher flashpoint than that of gasoline, and unlike gasoline its vapors do not evolve as suddenly. Therefore, it is unlikely that a fire will erupt during fueling of diesel-powered engines.

At the same time, however, other safe-fueling and operating procedures be followed during fueling of diesel-powered machines. Employers must train employees in safe practices during fueling. These include vapor containment, spill prevention, and procedures the operator must follow before leaving the machine cab to fuel the engine.

- c. Paragraph (d)(9)(iv) - Starting Fires. The rule allows flammable and combustible liquids, such as chain-saw and diesel fuel, to be used in certain conditions to start a fire. OSHA believes that this flexibility will allow piles of wood or slash to be burned when permitted by forestry officials.
 - (1) However, the revised provision does not permit flammable and combustible liquids to be used whenever a fire is needed. The revised provision only permits such liquids to be used where the employer assures that their use does not create a hazard for an employee.
 - (2) Employers must train employees to know under what conditions it is safe to start a fire with chain-saw fuel and in what situations using fuel may create a hazard for an employee. For example, using chain-saw fuel to start a fire in an enclosure is not safe and is not permitted. There are other ways to start fires where chain-saw fuel may create a hazard; for example, light-weight fire starters made of sawdust and wax.
9. Paragraph (e) - Hand and portable powered tools. The employer must assure that each hand and portable powered tool, including each tool provided by an employee, is maintained in serviceable condition and is inspected before initial use during a workshift. If a tool is not used during a workshift it does not need to be inspected. The tasks of maintenance and inspection may be delegated to the employee who uses the tools, but ultimately the employer remains responsible. Employers may meet their obligation of assuring that tools are maintained and inspected by informing employees of the maintenance and inspection procedures during training, reinforcing the requirements during regular safety and health meetings, and by conducting spot checks of employees who use tools. A written record of inspections is not required.
 - a. Paragraph (e)(2)(i) - Chain brakes. Each chain saw placed into initial service after February 9, 1995, must be equipped with a chain brake. In addition, each chain saw shall meet the chain saw brake and other performance and safety requirements of ANSI B175.1-1991, "Safety Requirements for Gasoline-Powered Chain Saws." No chain-saw kick-back device shall be removed or otherwise disabled.

The OSHI shall determine whether each chain saw placed into initial service after the effective date, including chain saws provided by employees, are equipped with a chain brake and otherwise meet the requirements of ANSI B175.1-1991 "Safety Requirements for Gasoline Powered Chain Saws." Compliance with the ANSI Standard can be verified by the presence of the manufacturer's label and the UL label on the chain saw.

NOTE: When chain saw sound levels exceed the requirements of 1910.95, the employer shall provide, and the employee shall wear, ear protection in accordance with the requirements of 1910.95. OSHA Standard 1910.95 applies, not ANSI B175.1-1991 which allows a higher noise level.

The OSHI shall also determine whether chain saws placed into service before the effective date are equipped with a kickback device, such as a chain brake, bar tip guard, reduced-kickback guide bar, or reduced-kickback saw chain. The OSHI shall determine whether the kickback device is in serviceable condition and has not been removed or disabled.

- b. Paragraph (e)(2)(iv) - Refueling chain saws. Chain saws must be fueled and started at least ten feet from any open flame or source of ignition and fueling area. A ten-foot distance provides adequate ventilation in both situations because outdoors, where constant air movement dissipates vapors, it is unlikely there could be a concentration of flammable vapors beyond ten feet.
- c. Paragraph (e)(2)(vi) - Starting chain saws. Chain saws must be started on the ground or where otherwise firmly supported. The final rule has been revised to state explicitly that drop starting chain saws is prohibited.

Nothing in the final rule prohibits an employee from standing upright when starting a chain saw, provided that the employee has firmly supported or secured the chain saw. For example, a chain saw operator would be in compliance if he or she rested the chain saw firmly on a log or other stationary item and started the chain saw while standing upright.

- d. Paragraph (e)(2)(xii) - Carrying chain saws. Chain-saws must be carried in a manner that will prevent employee contact with the cutting chain and muffler. There are devices currently available and used in the logging industry to prevent cuts and burns while carrying a chain saw, including leather and felt shoulder pads. These devices are not required by the final rule.
- e. Paragraph (e)(2)(xiii) - Retreating with chain saws. Chain saws must be shut off or the throttle released before the feller begins his retreat. The feller is not required to remain next to the tree waiting for the chain saw to idle down before retreating a safe distance from the falling tree. Rather, as soon as the feller releases the throttle, placing the machine into idle, he should immediately move on the retreat path a safe distance from the falling tree.

- 10. Paragraph (f) - Machines. The employer shall assure that each machine, including each

machine provided by an employee, is maintained in a serviceable condition and is inspected before initial use during a workshift. **If a machine is not used during a workshift it does not need to be inspected.** The employer may delegate the tasks of maintenance and inspection to the employee who uses the machine, but ultimately the employer remains responsible. Employers may meet their obligation of assuring that machines are maintained and inspected by informing employees of the maintenance and inspection procedures during training, by reinforcing the requirements during regular safety and health meetings, and conducting spot checks of employees who use machines. A written record of inspections is not required.

- a. Paragraph (f)(2)(iv) - Machine stability. To maintain stability, the employer must assure that each machine is operated within the limitations imposed by the manufacturer as described in the operating and maintenance instructions for the machine.

There are many ways in which the employer can accomplish this obligation. Manufacturers' operating instructions can be incorporated into operator training programs. Compliance with these operating instructions can be reinforced during regular safety and health meetings and through spot checks on employees' operating performance.

The OSHI shall determine whether a machine operator manual or set of instructions is maintained within the area where the machine is being operated, and whether each operator and maintenance person is following the manual or instructions. Failure to follow instructions may indicate lack of training or lack of supervision.

- b. Paragraphs (f)(2)(x) and (xi) - Machine shutdown procedures. Paragraph (f)(2)(xi) requires that the hydraulic and pneumatic energy storage devices that can move elements of a logging machine even after the machine has been shut down be discharged as specified by the manufacturer.

Paragraph (f)(2)(x) requires that any time the operator leaves the machine cab brakes must be applied, the moving elements must be grounded or secured, and the transmission must be placed in the manufacturer's specified park position.

- c. Paragraph (f)(3)(i) - Protective structures for logging machines. The following logging machines placed into initial service after February 9, 1995, must have FOPS and/or ROPS: tractors, skidders, swing yarders, log stackers, log loaders and mechanical felling devices, such as tree shears or feller bunchers.

The OSHI shall determine whether machines operated near cable yarding operations are equipped with roofs or sheds that provide sufficient protection from breaking cable lines.

- d. Paragraph (f)(3)(ii) - ROPS specifications. Logging machines manufactured after August 1, 1996, must be equipped with rollover protection structures (ROPS) that are tested, installed and maintained in accordance with the Society of Automotive Engineers (SAE) J1040, April 1988, "Performance Criteria for ROPS for

Construction Earthmoving, Forestry, and Mining Machines.”

- (1) ROPS and FOPS, which are required on logging machines placed into initial service after February 9, 1995, must also meet the requirements of SAE J397, April 1988, “Deflection Limiting Volume - ROPS/FOPS Laboratory Evaluation.” The 1988 standard updated a 1979 SAE standard on deflection limiting volume. There is no significant functional difference between the criteria of the 1988 and 1979 SAE standards. Therefore, ROPS and FOPS certified to meet the requirements of either the 1988 or 1979 SAE standards shall be deemed to be in compliance with the final logging standard.
 - (2) OSHA will collect and distribute a list of model numbers of machines that will show, with respect to manufacturers who, as of July of 1994, were making equipment not complying with the ROPS requirements of J1040 April 1988, the last model number or serial number on noncomplying equipment they manufactured or, if as of August 1, 1996, they are still manufacturing such equipment, the latest serial number of such equipment manufactured on or before August 1, 1996.
- e. Paragraph (f)(3)(vii) and (viii) Machine cab enclosures. Logging machines manufactured after August 1, 1996, shall have cabs which are completely enclosed, including entrances [paragraph (f)(3)(viii)]. The machine cab may be enclosed either with mesh material [with openings no greater than 2 inches (5.08 cm) at its least dimension] or with other material(s), provided the employer demonstrates that the alternative provides visibility and protection from penetrating objects which is equivalent to mesh material.
- (1) For those logging machines manufactured on or before August 1, 1996, paragraph (f)(3)(viii) provides that such machines may either comply with paragraph (f)(3)(vii) or be equipped with a protective canopy for the operator which meets the following requirements:
 - (a) The protective canopy shall be constructed to protect the operator from injury due to falling trees, limbs, saplings or branches which might enter the compartment side areas and from snapping winch lines or other subjects;
 - (b) The lower portion of the cab shall be fully enclosed with solid material, except at entrances, to prevent the operator from being injured from obstacles entering the cab;
 - (c) The upper rear portion of the cab shall be fully enclosed with open mesh material with openings of such size as to reject the entrance of an object larger than 2 inches in diameter. It shall provide maximum rearward visibility; and
 - (d) Open mesh shall be extended forward as far as possible from the rear corners of the cab sides so as to give the maximum

protection against obstacles, branches, etc., entering the cab area.

- (2) If the cab enclosure or any other item is attached to a ROPS, the attachment shall not affect the function or performance of the ROPS.
- (3) Materials that satisfy the performance criteria of the Society of Automotive Engineers SAE J1084, April 1980, "Operator Protective Structure Performance Criteria for Certain Forestry Equipment" are deemed to comply with the Logging Operations standard.

NOTE: OSHA intends the term "cab" to include any machine operator station, even if it is not a total enclosure providing weather and other protection.

- f. The employer must assure that any machine used for logging operations is in compliance with the other provisions of paragraph (f)(3). For example, all machines used in logging operations must have two means of egress. To the extent that any machine in service does not have a second means of egress, the machine must be retrofitted (e.g., replacing the stationary window shield with a hinged window to allow egress) or removed from service. Walking and working surfaces of each machine and machine work station must have a slip-resistant surface to assure safe footing; the walking and working surfaces of each machine must be kept free of waste, debris and any other material that could cause fire, slipping, or falling. The exhaust pipes of machines must be equipped with spark arresters. Engines equipped with turbocharger are not required to have spark arresters.

11. Paragraph (f)(4) - Overhead Guards. Each forklift must be equipped with an overhead guard which meets the requirements of the American Society of Mechanical Engineers, ASME B56.6-1992 (with addenda), "Safety Standard for Rough Terrain Forklift Trucks." (The preamble of the revised standard mistakenly references the 1987 ASME standard. This reference should be disregarded.) This section does not provide an exception for forklifts placed into service before the effective date of the Standard.

12. Paragraph (f)(7)(ii) - Machine brakes.

- a. Logging machines placed into initial service after September 8, 1995, must be equipped with three braking systems - service brakes, secondary brakes that are sufficient to stop the machine in the event the service brakes fail, and parking brakes.
- b. Some older machines were manufactured with primary brakes, but without secondary or parking brakes. OSHA is permitting these older machines to remain in use, provided that the employer assures the primary brakes are inspected and maintained at their designated level of effectiveness (i.e., are sufficient to stop and hold the machine and its rated capacity on the slopes over which it is being operated).

- c. Logging machines with braking systems meeting the following Society of Automotive Engineers (SAE) or International Standards Organization (ISO) standards are deemed to be in compliance with the final rule, provided that the employer assures that such braking systems are maintained in a serviceable condition:

SAE J 1026, April 1990, "Brake Performance - Crawler Tractors and Crawler Loaders."

SAE J 1178, June 1987, "Braking Performance - Rubber Tired Skidders."

SAE J1473, October 1990, "Brake Performance - Rubber Tired Earthmoving Machines."

SAE J1178/ISO 11169, December 1994, "Machinery for Forestry - Wheeled Special Machines - Vocabulary, Performance Testing, and Criteria for Brake Systems."

ISO 11512, March 1995, "Machinery for Forestry - Tracked Special Machines - Performance Criteria for Brake Systems."

ISO 3450, November 1985, "Earthmoving Machinery - Wheeled Machines - Performance Requirements and Test Procedures for Braking Systems"

13. Paragraph (f)(8) -Guarding. The OSHI shall determine whether effective guarding meeting the requirements of Subpart O of Part 1910 is installed on each machine and is in place while the machine is in operation in order to protect employees from moving parts.
14. Paragraph (g) Vehicles.
- a. Paragraph (g)(1) and (2) - Maintenance and inspection of vehicles. The employer is required to ensure that each vehicle is maintained in a serviceable condition and is inspected before initial use during a workshift. The final rule covers only those vehicles owned, rented, or leased by the employer. Therefore, vehicle inspection and maintenance requirements do not apply to employee-owned vehicles. However, OSHA notes that the employer has the duty to provide safe access to the worksite.
- b. With regard to inspections of equipment (e.g., vehicles, PPE, tools, and machines) covered by the final rule, OSHA never intended that the employer must conduct the actual inspection of the equipment. Employers may assign to others (including employees using the items) the responsibility to perform the required inspection and maintenance procedures for equipment, but ultimately the employer remains responsible for safe equipment at the workplace. A written record of the inspections is not required.
- c. The inspection requirements for equipment in the final rule apply only if the

equipment is used during the work shift. If it is not to be used, it does not need to be inspected.

- d. The OSHI shall determine whether operating and maintenance instructions are available in each vehicle and whether each vehicle operator and maintenance employee is complying with the instructions.

15. Paragraph (h) Tree harvesting.

- a. Paragraph (h)(1)(ii) - Unfamiliar or unusually hazardous conditions. Employees must contact their immediate supervisor for approval when unfamiliar or unusually hazardous conditions are encountered before cutting is commenced.

- (1) Certain situations are clearly covered by this paragraph, including worsening weather conditions which begin to impair the logger's vision; deepening snow or mud which begins to affect a logger's mobility; felling very large or very tall trees; cutting trees whose lean, structure, or location make it difficult to fell in the desired or safest direction; and using a driver tree to fell a danger tree.

- (2) It is also important that employers train their employees to work with their supervisors when they encounter situations which they have not dealt with before. This concept should also be reinforced in regular safety and health meetings.

- b. Paragraph (h)(1)(iii) - Felling distances. While manual felling is in progress, yarding machines shall not be operated within two tree lengths of trees being manually felled. This requirement does not apply to tree pulling operations where tree pulling and other team operations are used.

OSHIs shall determine that no yarding machine is operated within two tree lengths of any tree which is in the process of being manually felled and that no employee approaches manual or mechanical felling operations closer than two tree lengths until the feller or operator, respectively, acknowledge it is safe to do so.

- c. Paragraph (h)(1)(vi) - Removal of danger trees. The OSHI shall determine whether employees are following safe practices in the removal of danger trees. Safe practices include checking for signs of loose bark, broken branches or limbs, and checking for damage before the danger trees are felled or removed.
- (1) Danger trees, including lodged trees, must be felled or removed before other work is commenced in the area of the danger tree. Danger trees may be marked and avoided instead of being felled or removed, provided that no other work is commenced in the area of the danger tree. The standard recommends mechanical felling of danger trees. When other means are used, they must minimize employee exposure. This means that felling can be done by such means as having a single, designated, properly trained employee fell the tree. **OSHA is not prohibiting removal of a danger tree by felling another one into it.**
 - (2) The practice of felling a danger tree by felling another one into it, while not prohibited in general, is not automatically permitted to be used whenever a danger tree is felled. Paragraph (h)(1)(vii) of the standard also requires that where a danger tree is felled or removed, the feller must use a technique that minimizes employee exposure to the hazard. In some cases, felling a danger tree by felling another tree into it will not minimize employee exposure to the hazards, but rather may increase a risk the feller faces in removing the danger tree. In such circumstances, a safer method to remove a danger tree is to pull the tree down with a skidder or mechanical feller.
 - (3) OSHA permits a danger tree to be felled in this manner only where a careful examination of mechanical techniques is made first and where it is also determined that the hazards of felling the danger tree in this manner can be sufficiently minimized.
- d. Paragraph (h)(1)(ix) - Domino felling. The standard prohibits domino felling. Domino felling is defined in the final rule as “[the partial cutting of multiple trees which are left standing and then pushed over with a pusher.”
- (1) OSHA has revised the final rule to clarify that the definition of domino felling does not include the felling of a single tree with another tree. The domino felling that is prohibited in the final rule is the felling of multiple trees with another tree.
 - (2) The OSHI shall determine whether any employee is practicing the unsafe and prohibited act of harvesting trees by means of domino felling.

- e. Paragraph (h)(2)(i) - Retreat paths. Before a feller begins cutting a tree a retreat path must be planned and cleared. Once the backcut has been completed the feller must immediately move to a safe distance away from the tree on the retreat path.

- f. Paragraph (h)(2)(iv) - Spring poles. When a spring pole or other tree under stress (hereafter collectively referred to as spring poles) is cut, no employee other than the feller shall be closer than two tree lengths when the stress is relieved.
 - (1) Spring poles are danger trees and the requirements of paragraphs (h)(1)(vi) and (vii) must be followed to minimize exposure to hazards when felling danger trees. These requirements include felling danger trees by using mechanical means or other methods that minimize employee exposure to the hazards associated with the danger tree. Any employee cutting spring poles must have his body and chain saw in the clear when the stress in the spring pole is released.
 - (2) Because of the inherent dangers of spring poles, OSHA is also stressing that only trained workers are allowed to fell spring poles [paragraph (i)]. This training includes recognition of the hazard associated with spring poles (i.e., extreme stress on the entire tree), as well as the methods for dealing with spring poles. This training should stress that the preferred method of dealing with spring poles is to avoid them where possible (i.e., mark them and not work within two tree lengths of them), rather than felling or removing them. However, if avoidance is not possible, training should emphasize that the safest way to remove spring poles is by machine.
 - (3) Where employees are trained in safe felling techniques for spring poles and where the employer provides the necessary reinforcement of safe work practices through regular safety and health meetings and spot checks, the potential for death and injury in felling spring poles will be greatly reduced.

- g. Paragraph (h)(2)(vii) - Backcuts.
 - (1) Open Face Felling. The requirement that backcuts be placed above the level of the horizontal face cut does not apply to open face felling since there is no horizontal face cut where this method is being used.
 - (2) In open face felling, two facecuts are made diagonally into the stem producing a notch that is very open (i.e., 70 to 90 degrees). The openness of this notch allows the tree either to fall completely to the ground, or to fall a much greater distance than in conventional cutting before the notch closes and the hinge breaks.
 - (3) Where the tree is able to fall a greater distance before pressure is placed on the hinge, the tree is more likely to fall in the intended direction and is

less likely to kick back off the stump when the notch does close.

- (4) Humboldt cutting. The requirement that the backcut be placed above the level of the horizontal facecut does apply when the Humboldt cutting method is used. In the Humboldt cutting method, a horizontal cut is made into the face of the tree and a notch is cut into the stump below the horizontal cut at an angle. By contrast, in conventional felling, the notch is cut at a diagonal above the horizontal facecut.
- (5) In logging operations where the Humboldt method is most heavily used, fellers most often only cut a notch no greater than 45 degrees, making this method similar to that of conventional felling. Fellers do this to keep the stumps as short as possible and thereby reduce the loss of wood. At 45 degrees, however, the face notch alone does not fully address both the hazards of misdirected falling and kickback.
- (6) Proper backcuts that provide sufficient hinge wood are critical. Sufficient hinge wood helps to hold the tree to the stump during most of its fall and thereby allows the hinge to steer the falling tree in the right direction. If the hinge is inadequate or if the pressure is placed on the hinge, it will break too soon and the tree will be left without a steering mechanism. Without the hinge wood, the tree may twist and bend, and fall in the wrong direction.
- (7) Placing the backcut above the horizontal face cut is also necessary to provide a platform to block the tree from kicking back once the hinge does break. Where there is potential that the face notch will close before the tree hits the ground, which is the case with most cutting using the conventional and Humboldt methods, this platform is necessary to prevent kickback. Where the backcut is at the same level as the horizontal cut, there is no platform to block the backward movement of the tree should kickback occur.
- (8) The final rule does not specify how far above the face cut the backcut must be placed. OSHA believes that a backcut placed at least one inch above the face cut creates an adequate platform to prevent kickback and to allow the hinge to direct the falling of the tree. OSHA believes that a one-inch platform would provide an adequate margin of safety for the feller while still providing the contractor with a fairly square-end log.

NOTE: OSHA's decision to require that backcuts in Humboldt cutting be above the horizontal face is based in part on the fact that most loggers currently using this method are making the notch the same size as in conventional felling--45 degrees. A 45-degree notch is generally not open enough to control for both misdirected falling and kickback hazards. However, where a notch of 70 degrees or greater is cut, the notch in Humboldt cutting acts as it does in open face felling. As discussed above, in open face felling, because of the 70-to-90-degree notch, it is

unlikely that the tree will fall in the wrong direction or kickback, due to the openness of the notch rather than the type of cutting method being employed. Where the notch is at least 70 degrees, it is not as critical that the backcut be above the horizontal face cut or the notch of the face cut, regardless of whether the open face or Humboldt method is being used.

h. Paragraph (h)(3)(i) - Bucking and limbing.

- (1) Whenever rolling or sliding of the tree is reasonably foreseeable, bucking and limbing must be done from the uphill side of the tree. The revised final rule does not permit bucking and limbing to be done from the downhill side. Where a tree cannot be limbed or bucked from the uphill side, the tree must be moved to a stable position where there is no potential for the tree to roll or slide.
- (2) Because of the hazards associated with bucking and limbing and the high injury rate in these operations, employees must be trained to evaluate the following five potential hazards associated with limbing and bucking:
 - (a) Overhead hazards;
 - (b) Spring poles;
 - (c) Forward butt movement, to assess back pressure on limbs;
 - (d) Butt twist, to assess sideways pressure on limbs; and
 - (e) Position of the butt of the tree in relation to the ground, to assess tension in the tree stem.
- (3) Paragraph (h)(4) - Chipping. The OSHI shall determine whether the following requirements are met:
 - (a) Chipper access covers or doors are not opened until the drum or disc is at a complete stop.
 - (b) The chipper is shut down and locked out in accordance with the requirements of 29 CFR 1910.147 when an employee performs servicing or maintenance. 1910.147(c)(4)(i) requires the use of a documented lockout procedure and 1910.147(c)(7)(i) requires training of employees. Unlike 1910.147, however, 1910.266 does not allow the use of tags.
 - (c) Detached trailer chippers are chocked during usage on any slope where rolling sliding of the chipper is reasonably foreseeable.

- (4) Paragraph (h)(5)(v) - Yarding. Yarding lines must not be moved unless the yarding machine operator has clearly received and understood the signal. When in doubt, the machine operator must repeat the signal and wait for a confirming signal before moving the line. These requirements apply to all yarding machines and not just yarders.
 - (5) Paragraph (h)(5)(viii) - Hazardous obstructions in yarding. Yarding machines and their loads must be operated in a manner that prevents contact with obstructions which could create a hazard for an employee. The types of obstructions which are known to be hazardous include, but are not limited to, boulders, danger trees, stumps, log piles, power lines, and cable rigging.
 - (6) Paragraph (h)(6)(ii) - Loading. Only the machine operator and other essential personnel may be allowed in the work area during loading and unloading. The work area covered by this provision is the immediate loading work area as opposed to the entire logging work area (e.g., landing.).
 - (7) Loading/Unloading of trees. The loading of trees at the logging work site and loading/unloading of trees at trans-shipment points such as satellite wood yards are covered by the final rule.
 - a. With regard to unloading logs at pulp, paper and paperboard mills (hereafter pulp mills) and sawmills, OSHA has other standards which address some of the hazards associated with such unloading (See Pulp, Paper and Paperboard Mills, 29 CFR 1910.261, and Sawmills, 29 CFR 1910.265). To the extent that certain hazards associated with unloading trees are addressed by these other standards, they apply instead of the final logging rule. For example, both the pulp mills and sawmills standards include provisions specifying how binders and stakes must be released from the load of logs. As such, the similar provision contained in the logging final rule does not apply.
 - b. To the extent that the final logging rule addresses hazards not covered by other standards, the logging rule applies. For example, neither the pulp mills nor the sawmills standards address the hazards faced by log truck operators who remain in their cabs during unloading. Thus, paragraph (h)(6)(iii) applies to loading and unloading of trees at pulp mills and sawmills as well as at logging sites and satellite log yards.
16. Paragraph (i) - Training. OSHIs shall determine whether logging employees are adequately trained, using the following guidelines:
- a. All training must be conducted by a "designated person" as defined by the standard.

- b. The employer must certify the training of employees involved in logging operations.
- c. The training being provided to employees must meet the requirements specified in paragraph (i)(3).
- d. Safety and health meetings must be held at least each month. Meetings may be conducted individually, in crew meetings, in large groups, or as part of other staff meetings.
- e. Training materials must be appropriate in content and vocabulary to the educational level, literacy, and language skills of the employees being trained. For example, that could include the availability of training material and instructions in the native language of non-English speaking employees.
- f. Current and new employees who were previously trained in accordance with this standard do not have to be retrained. Where an employer relies on the previous training rather than retraining an employee, the employer must certify the date on which it was determined that the previous training was adequate. New employees must work under the close supervision of a designated person until the employee demonstrates the ability to safely perform their duties independently. The date of the demonstration will suffice for the date on which the employer determined prior training was adequate.
- g. The OSHI shall determine through employer/employee interviews whether new employees and newly-trained employees work under the close supervision of a "designated person" until the employee has demonstrated the ability to safely perform the job independently.
- h. The employer must assure that every employee performing logging operations has **first-aid** and **CPR** training which is current with the requirements of either the American Red Cross or the American Heart Association. Generally, these are three years for first-aid and two years for CPR. Employers are not required to provide the training. Employers are free to require, as a condition of employment, that new employees have or obtain first-aid and CPR training.

James Krueger, Director
for the OSHA Management Team

Distribution: OSHA Compliance and WSC Director

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