NORTH CAROLINA DEPARTMENT OF LABOR
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

Chapter 7	CFR Revision 136A
Subchapter 7F	CFR II

Field Information System

Logging
Subpart R, 29 CFR 1910.266, 1910.269(r)(5) General Industry
Subpart B, 29 CFR 1928, Agriculture
Amendments to Final Rule

DISCUSSION:

On October 12, 1994, Federal OSHA issued a new rule addressing the logging industry which was adopted verbatim in North Carolina by the Commissioner of Labor. The original effective date was April 1, 1995, with some sections' effective date delayed until August 9, 1995. On September 8, 1995, Federal OSHA published corrections and amendments to the Logging Standard to clarify portions of the original regulatory text.

ACTION:

These corrections and amendments to the final rule at 29 CFR 19 10 were adopted verbatim in North Carolina by the Commissioner of Labor with an effective date of January 1, 1996.

Copies of the regulatory text from the original Federal Register announcement (Vol. 59, No. 196) and the federal OSHA Notice of Stay (Vol. 60, No. 26) are attached. A copy of the regulatory text of 13 NCAC 07F.0101 is available upon request.

Please file this NC CFR Revision in CFR II of your Field Information System

Date: 12/7/1995

Charles N. Jeffress, Director
Division of Occupational Safety and Health
(Signed on Original)

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Federal Register

Friday
September 8, 1995

Part VII

Department of Labor

Occupational Safety and Health Administration

29 CFR 1910

Logging Operations; Final Rule

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1910

[Docket No. S–048]

Logging Operations

ACTION: Final rule; corrections and technical amendments.

SUMMARY: This notice corrects and amends the final rule on Logging Operations which was published by OSHA on October 12, 1994 (59 FR 51672). In response to questions raised about certain provisions in the rule, OSHA is clarifying language in the regulatory text so it most accurately expresses the Agency's intent with respect to the provisions in question and to provide additional information with regard to some of the provisions.

EFFECTIVE DATE: September 8, 1995.

FOR ADDITIONAL INFORMATION: Ms. Anne Cyr, Office of Information and Consumer Affairs, Occupational Safety and Health Administration, Room N–3637, U.S. Department of Labor, 200 Constitution Avenue NW., Washington, DC 20210, (202)–219–8148.

SUPPLEMENTARY INFORMATION:

Background

On October 12, 1994, OSHA published a revised standard providing protection for workers performing logging operations (59 FR 51672). The final rule (29 C.F.R. 1910.266) had an effective date of February 9, 1995.

After the final rule was published, the Equipment Manufacturers Institute (EMI), the Portable Power Equipment Manufacturers Association (PPEMA), and Homelite, a manufacturer of chain saws, filed timely petitions with the court seeking judicial review of the standard. The deadline for filing a petition for judicial review was December 12, 1994. After the deadline had passed, the Associated California Loggers, the Associated Oregon Loggers, Inc., the Montana Logging Association, and the Washington Contract Loggers Association also filed objections to the final rule.

These parties and organizations raised questions about certain provisions of the final rule. After consideration of their questions, OSHA published a **Federal Register** notice (60 FR 6447, February 8, 1995) staying enforcement of 12 provisions of the standard for six-months, until August 9, 1995. The other provisions of the final rule were not affected by the partial stay and became effective on February 9, 1995.

In the February 8 notice, OSHA explained that the partial stay would give the Agency time to clarify language in the regulatory text and preamble so it most accurately expressed the Agency's intent with respect to the provisions in question and to provide additional information with regard to some of the provisions. The provisions OSHA stayed were: (d)(1)(v)—insofar as it requires foot protection to protect the employee against chain-saw penetration; (d)(1)(vii)—insofar as it requires face protection; (d)(2)(iii)—annual review and approval of first-aid kits by a health care provider; (f)(2)(iv)—machine operation on slopes; (f)(2)(xi)—machine shutdown procedures; (f)(3)(ii)—ROPS specifications; (f)(3)(vii) and (viii)—machine cab enclosures; (f)(7)(ii)—machine parking brakes; (g) (1) and (2)—maintenance and inspection of employee-owned vehicles; (h)(2)(vii)—location of the backcut in Humboldt cutting.

PPEMA and Homelite also requested OSHA to stay enforcement of the requirement that chain saws be equipped with chain brakes. OSHA denied their request. Thereafter, PPEMA withdrew its petition for judicial review. Homelite filed a motion for a stay pending review of the chain-brake requirement with the U.S. Court of Appeals for the Fourth Circuit. OSHA opposed Homelite's motion and American Pulpwood Association (APA) filed an amicus opposing the stay. OSHA also filed a motion to dismiss Homelite's petition for lack of standing. The court denied both Homelite's and OSHA's motions. Homelite continues to challenge the chain brake provision of the final rule in the Fourth Circuit. EMI withdrew its petition for review pursuant to a settlement.

During the six-month stay of enforcement, OSHA received other inquiries about the final rule. In addition, OSHA met with representatives of various logging associations such as APA and the Western Logging Council (WLC), equipment manufacturers such as EMI and PPEMA, and other individuals in order to discuss the stayed provisions as well as other questions they had regarding the final rule.

On August 9, 1995, OSHA published a **Federal Register** notice extending the partial stay for 30 days, until September 8, 1995, in order to complete its reconsideration of the issues, to complete corrections and clarifications in the regulatory text and preamble, and to revise its compliance directive to reflect those changes (60 FR 40457). This notice corrects and amends the final rule, and provides information and clarification regarding the stayed provisions and other issues.

Stayed Provisions

Paragraph (d)(1)(v)—Cut-Resistant Foot Protection

The final rule requires that the employer assure that each employee wears foot protection, covering and supporting the foot and ankle, which is waterproof or water repellant. OSHA stayed one aspect of the foot protection provision which required that logging boots provide protection from penetration by chain saws. Some parties requested OSHA to drop the chain-saw penetration requirement, contending that rubber and calk-soled logging boots providing employees protection from penetration by chain saws were neither necessary nor available.

The rulemaking record strongly supports the need for logging footwear which protects chain-saw operators against penetration by chain saws. As OSHA discussed in the preamble to the final rule, 10 percent of injuries reported in the WIR survey were to the foot and ankle (Ex. 2–1). In addition, APA submitted to the record an injury report where a chain-saw operator who was not wearing protective footwear cut off his foot when the bar went through the soft spot of a tree trunk and into his foot (Ex. 26A).

Reports of foot injuries resulting from chain saws led several commenters to recommend that OSHA require foot protection be cut-resistant (Tr. W1 148, 195; Tr. W2 139). For example, Mr. Joseph William, owner of Jayfor Logging, said he provides and requires employees to wear cut-resistant logging boots (Tr. W1 195). In addition, Mr. Williams said all employers that are members of the Nortim program, a logging workers' compensation insurance group, must assure that employees wear cut-resistant foot protection (Tr. W1 158, 195).

Based on its reconsideration of the record, OSHA maintains that an employee operating a chain saw needs to wear logging boots which will provide protection against penetration by the saw. However, based on discussions during the stay, OSHA is correcting the language of this requirement to express more clearly the Agency's intent regarding the type of chain-saw protection that is required for the foot. In the final rule, OSHA intended by the language ''protect the employee from penetration by chain saws'' to mean that foot protection worn by employees be equipped with material that is *cut-resistant* to chain saws. That

is, OSHA intended that foot protection prevent the chain saw from cutting the employee before the employee is able to react, or before the protective material jams the chain saw. The language in the final rule was not intended to require that the protective material itself must be totally impervious to penetration by a chain saw. Rather, the available protective clothing and footwear is equipped with multiple layers of protective material, such as but not limited to ballistic nylon, Kevlar, or the layered-material in heavy-duty logging boots; which provide cut resistance as follows: the protective material must either provide enough resistance to the saw chain to give the operator time to react and pull the saw away from the foot before the saw chain penetrates through all the layers, or jam the flywheel and chain, thereby stopping the saw. OSHA is revising the regulatory text to indicate that leg protection must be made of material that is cut-resistant, as OSHA has defined it above. OSHA stresses that this change is merely adoption of terminology which is used in the industry, but the use of this term does not change the meaning or intention of the final rule.[1]

Some parties also said that rubber and calk-soled boots which are needed in working in the steep terrain of the northwest were not manufactured with chain-saw cut-resistant material. However, the rulemaking record shows that such boots are available and have been available for a considerable period of time (Ex. 4–103, 5–30). Specifically, E. I. du Pont de Nemours & Company, the manufacturer of Kevlar, told OSHA in 1989 that rubber logging boots were available that contain Kevlar, and which du Pont ''feel[s] offers adequate protection against chain saw injuries, based on European test standards'' (Ex. 5–30). In addition, an article from the June 1987 *The Logger and Lumberman* said that a cut-resistant rubber boot, which had been successfully tested by the U.S. Forest Service, was available (Ex. 4–103). Moreover, in discussions with other manufacturers and distributors of personal protective equipment during the six-month stay, OSHA has confirmed its original conclusion that a variety of companies currently manufacture logging boots, including rubber and calk-soled boots, which are equipped with material to protect against chain saw cuts. Therefore, OSHA is lifting the stay of this requirement. Effective September 8, 1995, employers shall assure that foot protection worn by each employee who operates a chain saw, including rubber, calk-soled and other slip-resistant boots, is chain-saw cut-resistant.

OSHA has also clarified the final rule to indicate that the cut-resistant foot protection requirement applies only to employees who operate a chain saw. OSHA notes and is specifying in the revised compliance directive that this applies to *any operation* of a chain saw, whether as a regular part of the employee's job or incidental to the job. There is nothing in the records that indicates chain-saw accidents involve only those who operate chain saws on a regular basis. OSHA believes that those who operate chain saws only infrequently may be at particular risk because they may be less familiar with the chain saw and less experienced in managing the hazards associated with its operation. Based upon the hazards to employees when they use a chain saw and the ready availability of the protective equipment to minimize such hazards, OSHA believes that all employees who use a chain saw must be protected against foot injury regardless of the frequency of the chain saw usage. Logging employees who do not operate chain saws at all need not have foot protection that is chain-saw cut-resistant.

OSHA also stresses that the foot protection requirement in the final rule is expressed in performance terms. For example, nothing in the final rule requires that employees wear steel-toed logging boots in order to meet the cut-resistance requirement. Steel-toed boots meeting the ANSI foot protection requirements do provide adequate protection against chain-saw cuts for the *toe*. However, if such boots do not have material to protect the rest of the foot from chain-saw cuts they do not comply with the final rule. The final rule requires that logging boots for chain-saw operators must provide cut-resistant protection for the foot, not just the toe. The record indicates that there is available supplemental cut-resistant foot protection which can be attached to logging boots to provide the needed protection (Ex. 5–14).

After publication of the final rule, OSHA was requested by some parties to clarify the rule to indicate from what type of material logging boots must be constructed. They recommended that OSHA specify that logging boots be made of industrial grade or top grain leather or other material. Instead of specifying the type of material which must be used, OSHA has expressed the requirement in performance terms. For example, OSHA has specified that foot protection cover and provide support to the ankle. The purpose of this requirement is to help reduce the significant number of ankle and foot injuries (sprains and fractures) (Ex. 2–1). OSHA is confident that employers and employees will be able to select logging boots that provide adequate ankle support because various logging associations already recognize that hiking and other light duty boots do not provide sufficient protection.[2]

Paragraph (d)(1)(vii)—Face Protection

In the final rule, OSHA required that employers provide and pay for protection for the eyes and face for any employee where there is a potential for injury due to falling or flying objects. After publication of the final rule, OSHA was requested by some parties to stay the face protection requirement in order to clarify the following concerns.

First, these parties requested OSHA to clarify in what logging operations face protection is required. The rulemaking record shows that some employees do need protection for the face as well as the eyes (e.g., chipper operators) (Ex. 2–1). In the WIR survey 42 face injuries were reported during the three-month survey period which involved other than the eye (Ex. 2–1). OSHA believes that chipper operators, employees cutting limbs, branches or spring poles, and employees moving through dense underbrush are among those for whom the risk of facial lacerations from wood, wood chips, needles or splinters is most likely. OSHA is revising the final rule to indicate that where employees are at risk of facial injury they must wear protection meeting the requirements of subpart I of Part 1910 (29 CFR 1910.133).

For other employees, however, eye protection alone may be adequate to protect them from the hazards present. For example, an employee performing machine maintenance may only require eye protection. For these employees, the most likely hazards are dirt, particles or other substances flying or splashing into the eyes. For example, maintenance employees need eye protection where they are using metal cut-off or grinding

[1] OSHA notes that the most important aspect of the protective material is not that it be made specifically of ballistic nylon, but that it is comparably cut-resistant. OSHA intended its use of the term ''ballistic nylon'' in the final rule to be consistent with the industry's generic use of the term as shorthand for cut-resistant materials in general. Indeed, in the preamble to the final rule, OSHA discussed several types of materials which are currently available to provide protection against chain-saw cuts.

[2] OSHA notes that the final rule does not require the employer to provide logging boots for employees. The cost of providing logging boots may be borne by employees. The employer, however, must assure that logging boots which are worn by an employee are in serviceable condition and meet the requirements of paragraph (d)(1)(vi) of the final rule.

tools. Subpart I requires employers to assess the hazards in the workplace to what personal protective equipment is necessary. OSHA is revising the final rule to emphasize that where the assessment indicates a risk of facial injury exists, face protection must also be provided and worn.

Second, these parties requested that OSHA clarify whether the final rule requires employees to wear both eye and face protection simultaneously. It was OSHA's intention that of face protection would adequate protection for both the eyes and the face. Therefore, OSHA is adding a note to the final rule to clarify that where the employer determines that protection against eye and face injury is necessary and provides the employee with a device that protects both the eyes as well as the face, the final rule does not also require the employee to wear separate eye protection.

Finally, these parties said that face protection should not be required because it may interfere with the logger's vision, thereby creating additional hazards. They said optical characteristics of face shields made of solid transparent material, as required by subpart I, could distort peripheral vision. However, they did not provide evidence to this effect during the rulemaking and they have not identified any data in the rulemaking record that would support this contention. There is nothing in the record that would lead the Agency to believe that potential distortion of peripheral vision by face shields creates a greater hazard than lack of face protection. Of the injuries reported in the WIR survey, obstructed vision was not identified as the cause of any injury (Ex. 2–1).

They also said that the logger's vision could be reduced in wet weather because of wood chips or sawdust sticking to the face shield or the transparent material fogging up. Once again, the record does not indicate that this is a significant problem. In any event, the final rule allows flexibility in selecting face protection for employees working in different conditions. Specifically, with the exception of chipping operations, the final rule expressly permits logger-type mesh screens to be used for face protection. Such screens provide protection from penetration by branches, limbs and saplings, yet do not restrict vision in wet weather or fog up. Information in the record indicates that face protection comprised of mesh screens is readily available in the industry. In fact, many types of safety headgear manufactured for the logging industry are equipped with mesh screen face protection.

OSHA notes, however, that most logger-type mesh face screens do not meet the literal requirements of Subpart I because they do not comply with the referenced ANSI standards, ANSI Z87.1–1989 or ANSI Z87.1–1968. Mesh face screens are not constructed with impervious transparent material and do not necessarily meet the impact resistance requirements of the ANSI standards. For this reason, they may not be used in chipping operations where impact resistance is needed to prevent injury from wood, wood chips, needles, or splinters being propelled from chipping machines at great speed. For chipping operations, therefore, eye and face protection must meet the requirements of subpart I.

However, for other logging operations such as chain-saw operation, OSHA believes that logger-type mesh screens will provide adequate protection. In these operations 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. Therefore, OSHA is revising the final rule and compliance directive to indicate that an employer who provides and requires chain saw operators performing felling, limbing and bucking activities to use a logger-type mesh face screen would be deemed to be in compliance with this paragraph. Additionally, logger-type mesh face screens may also be used by those employees performing yarding operations. For all other logging tasks (e.g., machine and vehicle maintenance, cutting winch cables, drilling, grinding, and welding during equipment repair) for which the hazard assessment indicates eye and face protection are necessary, the employer must provide protection which meets the requirements of subpart I.

Paragraph (d)(2)(iii)—First-Aid Kits

Paragraph (d)(2) of the final rule requires that employers provide and maintain first-aid kits. In addition, this paragraph specifies the minimum content requirements for first-aid kits (Appendix A). These provisions became effective February 9, 1995.

OSHA stayed the requirement that the number and contents of first-aid kits be reviewed and approved annually by a health care provider. Some parties told OSHA that annual approval of first-aid kits by health care providers would be burdensome for employers. Because the final rule already contains a list of minimum contents for the first-aid kit, OSHA is persuaded that eliminating the requirement of annual health care provider review will not reduce protection for logging employees.

The minimum first-aid kit and first-aid training requirements provided in the final rule were developed in consultation with the OSHA offices of occupational medicine and occupational health nursing. This careful review of the minimum contents of the required first-aid kits makes it unnecessary for OSHA to require employers to have the kits reviewed annually by a health care provider. Therefore, OSHA is correcting the final rule accordingly.

At the same time, however, OSHA encourages logging employers to conduct an annual review of the contents of first-aid kits, including engaging in consultation with a health care provider regarding approval of those contents. Such review can help to ensure that the contents are adequate for the number of employees and conditions of the particular logging worksite, and that first-aid kits contain the latest first-aid innovations and technologies which would be useful to the logging work environment. Because of the remoteness of logging worksites from professional medical services, OSHA believes that for some logging sites, additional attention should be given to the contents of first-aid kits. Annual health care provider review is clearly permitted in these circumstances, and the final rule provides for such review as a ''best practice'' recommendation for employers.[3]

Paragraph (f)(2)(iv)—Machine Operation on Slopes

OSHA stayed the provision requiring that logging machines not be operated on any slope greater than the maximum slope recommended by the manufacturer after learning that logging machine manufacturers do not specify a maximum slope on which particular logging machines can be safely operated. The intent of this requirement was to ensure that machines used on sloping terrain are operated in a manner that will prevent the machine from tipping or rolling over. As OSHA explained in the preamble to the final rule, injuries and fatalities resulting from tipping and rollover accidents are

[3] OSHA notes that the employer does not need to take the actual first-aid kits themselves to the health care provider for review and approval. Rather, the health care provider may review the list of the items contained in the first-aid kits, along with a description of the conditions of the particular worksite.

prevalent in the logging industry because of the rough terrain on which logging machines operate (Ex. 2–1).

The maximum slope of operation varies depending on the conditions under which the machine is being operated. These conditions include the terrain (e.g., wet, muddy, dry, compacted, rocky), the direction of the machine operation (e.g., cross-slope, uphill, downhill, diagonally across the slope), and the operation being performed. OSHA is revising the final rule to require that employers assure that machine operators follow the instructions, directions and limitations described by the manufacturer in the operating and maintenance manuals.

There are many ways in which an 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.

Paragraph (f)(2)(xi)—Machine Shutdown Procedures

The final rule specifies procedures which must be followed when a machine is shut down. These include applying brakes and grounding or securing moving elements (paragraph (f)(2)(x)), and discharging pressure and stored energy (paragraph (f)(2)(xi)). With regard to the discharge requirements, this provision is intended to prevent moving elements, such as blades, buckets, saws and shears from being unexpectedly or inadvertently activated or engaged after the machine has been shut down. Such activation has resulted in severe injury or death to logging operators, maintenance personnel or others in the vicinity of the machine (Ex. 2–1, 4–61, 4–63, 4–64, 26A).

OSHA stayed the discharge provision (paragraph (f)(2)(xi)) in order to reconsider whether the provision could be misinterpreted to require unnecessary discharging of pressure and stored energy. For example, OSHA was concerned whether employers might misinterpret the provision as requiring the discharge of pressure and stored energy not related to moving elements of the machine, such as bleeding machine brakes, a result which OSHA had not intended.

OSHA is therefore correcting this provision so it more accurately identifies and addresses the hazards OSHA intended to control in the final rule. Revised paragraph (f)(2)(xi) requires that the hydraulic and pneumatic storage devices which can move the moving elements of a logging machine after machine shut down and expose employees to serious hazards must be discharged as specified by the manufacturer.

OSHA is also correcting paragraph (f)(2)(x) to require that any time the operator leaves the machine cab, the parking brakes must be applied, the moving elements must be grounded or secured, and the transmission must be placed in park. A further review of the record indicates that such a correction is necessary since the hazard of unexpected or inadvertent activation of logging machines is present any time an operator leaves the machine cab, whether to perform another logging operation or to stop work for the day. The record includes several reports of machine operators and others who died or were severely injured when they failed to engage the parking brakes and lower moving elements to the ground before dismounting from the machine (Ex. 4–61, 4–64, 26A).

OSHA has addressed the hazard of inadvertent machine engagement in other rules as well (e.g., 29 CFR 1910.147, 29 CFR 1910.178). OSHA believes the same hazard addressed by those rules is present in logging operations. Therefore, OSHA is correcting the final rule and compliance directive to indicate that braking, grounding and parking procedures must be followed any time the operator leaves the machine cab.

Paragraph (f)(3)(ii)—ROPS Specifications

The final rule requires that logging machines be equipped with rollover protective structures (ROPS) that are tested, installed and maintained in accordance with the Society of Automotive Engineers (SAE) J1040, April 1988, performance criteria for ROPS. OSHA stayed this requirement for six months and is now amending the ROPS requirement to state that only machines manufactured after August 1, 1996 must have ROPS which meet the 1988 SAE standard.

OSHA is making this change because, while many machines currently manufactured do meet the 1988 SAE ROPS standard, other machines currently manufactured or in use do not. These machines do have ROPS for the most part. However, the ROPS on these machines meet the 1979 SAE standard instead. While machines that meet the 1988 standard have additional protection (e.g., protection for longitudinal rollover), machines meeting the 1979 standard do provide protection for the most frequently occurring hazard: horizontal rollover. As such, OSHA believes that permitting an exception for machines already in service should not reduce significantly the level of protection provided to machine operators. Therefore, OSHA is revising the compliance directive to indicate that machines manufactured on or before August 1, 1996, which comply with the 1979 SAE ROPS standard are appropriate for use, provided the ROPS is maintained at its designed level of effectiveness (See paragraph (f)(1)(i)—machine general maintenance requirement).[4]

In addition, EMI has agreed to use its best efforts to provide OSHA with a list of the model numbers of the last logging machines manufactured on August 1, 1996. OSHA will use this list to update its logging compliance directive as to which logging machines must meet the 1988 SAE ROPS standard.

Paragraph (f)(3) (vii) and (viii)—Machine Cab Enclosures

OSHA stayed two provisions in the final rule dealing with cab enclosures.[5] Paragraph (f)(3)(vii) required that the lower portion of machine cabs, up to the top of the instrument panel or 24 inches, be enclosed with solid material, except at entrances. Paragraph (f)(3)(viii) required that the upper portion of cabs be enclosed with mesh material (no greater than 2 inches at its least dimension) or with other material(s) that provide equivalent protection and visibility. The intention of these provisions was to ensure that the cab enclosure provided the machine operator with protection from objects penetrating the cab, without impeding the operator's vision.

OSHA stayed these provisions because it was concerned that this language could be misconstrued in ways that would reduce protection for machine operators. OSHA is revising the final rule to require that logging machines manufactured after August 1, 1996, have cabs which are completely enclosed, including at entrances (paragraph (f)(3)(vii)). The revised provision also clarifies that the

[4] The final rule also provides that ROPS and FOPS required on logging machines placed into initial service after the effective date 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. OSHA notes that there is no 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. OSHA is revising the compliance directive to reflect this.

[5] OSHA intends the term ''cab'' to include any machine operator station, even if it is not a total enclosure providing weather and other protection.

enclosure must be constructed with mesh material (with openings no greater than 2 inches at its least dimension), or with other material(s) which the employer demonstrates will provide equivalent visibility and protection from penetrating objects.[6]

While some logging machines currently manufactured do meet this requirement, others do not. For those logging machines manufactured on or before August 1, 1996, OSHA is clarifying in paragraph (f)(3)(viii) that such machines may either comply with revised paragraph (f)(3)(vii) or continue to meet the protective canopy requirements specified in the 1971 pulpwood logging standard.[7]

Paragraph (f)(7)(ii)—Machine Brakes

In the final rule, OSHA required that logging machines be equipped with service brakes (primary brakes) (paragraph (f)(7)(i)), and a secondary braking system, such as emergency brakes or parking brakes (paragraph (f)(7)(ii)). The final rule specified that the secondary braking system be sufficient to stop the machine, in the event that the service brakes fail, and to maintain parking performance.

OSHA stayed paragraph (f)(7)(ii) insofar as it implied that parking brakes were adequate secondary brakes for stopping a moving logging machine if the service brakes failed. Primary brakes (service brakes), secondary stopping brakes (backup brakes), and parking brakes are all necessary devices for logging machines. OSHA is correcting paragraph (f)(7)(ii) to clarify that logging machines placed into initial service after September 8, 1995, must be equipped with three braking systems—service brakes, secondary brakes and parking brakes.

Some older machines were manufactured with primary brakes, but without secondary or backup brakes, and OSHA has learned that retrofitting these machines may not be feasible. OSHA is permitting these older machines to remain in use, provided that the employer assures the service brakes are inspected and maintained at their designed level of effectiveness. Therefore, OSHA is correcting paragraph (f)(7)(ii) to specify that only machines placed into initial service on or after September 8, 1995 must be equipped with secondary and parking brakes.[8]

Paragraph (g) (1) and (2)—Maintenance and Inspection of Employee-Owned Vehicles

The revised logging rule required employers to assure that any vehicle used off public roads to perform any logging operation, including transporting employees, be maintained in a serviceable condition and be inspected before it is used during a work shift. OSHA agreed to reconsider the maintenance and inspection requirements as they pertained to employee-owned vehicles and stayed the requirements for six months.

OSHA explained in the preamble to the final rule that it was aware that logging employees operate vehicles on private roads or on private property where there may be no roads or only rugged trails. The WIR survey shows that vehicle operators and employees riding in such vehicles are being injured in vehicle accidents where employees are being asked to drive vehicles over terrain that may be quite hazardous (e.g., extremely muddy, steep, and unlevel). For example, according to the WIR survey, there were 33 mobile equipment accidents resulting in employee injury during the three-month survey period (Ex. 2–1). Of these, 24 (72 percent) occurred during other than skidding or yarding operations (Ex. 2–1). In addition, the WIR survey reported 34 injuries on employer-built roads during the same period (Ex. 2–1).

Based on the record evidence, OSHA determined that it was important that logging employees on and between logging sites only drive vehicles that are in proper condition and of the appropriate type for the terrain in question. Because many employers require or permit employees to drive their own vehicles over this terrain to reach the logging work site, OSHA applied the inspection and maintenance requirements to these vehicles as well. However, OSHA is also aware, and others have pointed out, that most States do have periodic vehicle inspection requirements. These inspections are more detailed and comprehensive than the inspection contemplated by the logging rule. As such, OSHA believes that such inspections are adequate, at least with regard to employee-owned vehicles, and that imposing additional vehicle inspection requirements on logging employers is unnecessary. Therefore, OSHA is revising the final rule to apply the vehicle inspection and maintenance requirements only to vehicles which the employer owns, rents or leases. OSHA has done this by revising the definition of ''vehicle'' covered by the final rule. OSHA also notes that the employer has the duty to provide safe access to the worksite.[9]

With regard to inspections of vehicles, as well as other equipment covered by the final rule such as personal protective equipment, tools, and machines; OSHA never intended that the employer must conduct the actual inspection of such equipment. The compliance directive clarifies that employers may delegate to others, including employees using the items, the performance of inspection and maintenance tasks; but ultimately the employer remains responsible for safe equipment at the workplace. There are different ways in which the employer can assure that equipment is properly maintained and inspected. Employers can inform employees of maintenance and inspection procedures during training, reinforce the requirements during regular safety and health meetings, and conduct spot checks of equipment.

Finally, OSHA notes in the compliance directive that equipment inspection requirements 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.

Paragraph (h)(2)(vii)—Backcuts

The final rule requires that backcuts be placed above the horizontal face cut

[6] OSHA is noting in the revised compliance directive that material(s) 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 revised provision.

[7] OSHA notes and is clarifying the compliance directive to indicate that extended compliance time and exceptions to compliance apply only where specifically indicated. With regard to all other provisions, the extensions and exceptions do not apply for machinery already in use. 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, whether initially placed in service before or after the effective date, 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 windowshield with a hinged window to allow egress) or removed from service.

[8] OSHA is noting in the revised compliance directive that logging machines with braking systems meeting the Society of Automotive Engineers standards for forestry (SAE J1178, June 1987, ''Braking Performance—Rubber Tired Skidders'') or earthmoving (SAE J1026, April 1990, ''Brake Performance—Crawler Tractors and Crawler Loaders'') equipment 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.

[9] OSHA is deleting from revised paragraphs (g)(1) and (g)(2) specific reference to application of vehicle maintenance and inspection requirements to vehicles used to transport employees. Since transportation of employees to, from and between logging sites off public roads is included in the definition of logging operations, OSHA believes it is not necessary to repeat the reference in these provisions.

in all felling except tree pulling operations. OSHA was requested to clarify whether the requirement in paragraph (h)(2)(vii) applies to Humboldt cutting and open face felling. OSHA stayed for six months the backcut requirement in paragraph (h)(2)(vii) as it applied to felling trees using the Humboldt cutting method. OSHA also explained that it would use the six months to further clarify the backcut requirement as it applies to both cutting methods.

Open face felling. After OSHA published the final rule, the Agency was requested to clarify whether the backcut requirement applied to open face felling. In brief, the backcut requirement does not apply to open face felling, and OSHA is clarifying the final rule and compliance directive accordingly.

In open face felling, two facecuts are made diagonally into the stem so there is no horizontal face cut. The backcut requirement applies only where a horizontal face cut has been made. Where a horizontal face cut is used, there is a greater potential that the notch (or wedge) is not as open or that very little or no hinge wood will be left if the backcut is made at the same level. This may result in the tree kicking back or falling in the wrong direction.

In open face felling, the notch is much more open than in conventional felling. As such, there is little or no danger that placing the backcut at the level of the notch will result in the notch closing (i.e., the falling tree hitting the stump) too soon and the tree kicking back off the stump. This is because the openness of the notch permits the tree to fall in the intended direction for a greater interval before the notch closes and the hinge breaks. Either the tree is on the ground or almost parallel to the ground, and thus committed to falling in the intended direction, before the hinge breaks. In addition, there is little danger that no hinge wood will be left to help direct the falling of the tree.

Humboldt cutting. In the Humboldt cutting method a horizontal cut is made into the face of the tree and a notch is cut below the horizontal cut at an angle. By contrast, in conventional felling, the notch is cut at a diagonal above the horizontal face cut.

In several regions the Humboldt cutting method has replaced the conventional method. The Humboldt cutting method is heavily used in the western States and is also used on high quality trees, such as veneer logs and redwoods. Loggers have switched from the conventional to the Humboldt method primarily for productivity reasons. In Humboldt cutting, the notch is made into the stump rather than the log (Ex. 9–15). Thus, if properly done, the cutting of the notch does not result in the loss of useable wood. OSHA is aware that some fellers who use the Humboldt cutting method prefer to make the backcut at the level of the horizontal face cut, but the record indicates their preference is due to these production rather than safety reasons (Ex. 9–15). Some contractors and mills want log butts to be smooth. By placing the backcut at the same level as the face cut, these loggers do not have to make an additional cut after the tree is felled in order to smooth out the log butt. In some cases, to make the additional cut might require walking down a hill where the felled tree has rolled or the additional cut might have to be made by the employee bucking the tree.

In logging operations where the Humboldt method is most heavily used, fellers most often only cut a notch that is no greater than 45 degrees, making the openness of the notch similar to that of conventional felling. Fellers do this in order to keep the stump as short as possible and thereby reduce the lost of useable wood. At 45 degrees, the face notch alone does not fully address both the hazards of misdirected falling and kickback.

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 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. (OSHA is revising paragraph (h)(2)(vi) to expressly state that this requirement is intended to address the hazard of misdirected falling.)

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 a 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 start to occur. (OSHA is revising paragraph (h)(2)(vii) to expressly state that this requirement is intended to address the hazard of tree kickback.)

In both, misdirected falling and kickback, the feller or other team member could be hit by the tree. The risks of such injury are further increased if other conditions are present, such as wind, sloping terrain, or tree lean.

To address these risks, most State logging safety rules require that backcuts be above the face cut in all felling, including Humboldt cutting. For example, in Oregon, a State-plan State, the backcut requirement applies to any tree with an 8-inch or larger diameter base height. Only the State of Montana, which has advisory criteria, permits the backcut to be level with the face cut in Humboldt cutting.

After reviewing the record in this rulemaking, OSHA reaffirms that the record supports the necessity of applying the backcut requirement specified in paragraph (h)(2)(vii) to Humboldt cutting (Ex. 2–1, 4–61, 4–64, 26A; 59 FR 51675). The record clearly shows that manual felling is the single most dangerous occupation in logging. The BLS Census of Fatal Occupational Injuries indicates that more than one-half of all logging employees killed in 1992 were felling trees at the time of their accident (59 FR 51675). In addition, the WIR survey indicated that almost one quarter of all employees reporting injuries were felling trees at the time they were injured, and that the most frequently reported cause of their injuries was being hit by a tree (Ex. 2–1). The record also shows that tree kickback and misdirected falling are two of the major reasons why employees are hit by falling trees. For example, the record contains many reports of employee injuries and deaths due to misdirected falling and tree kickback (Ex. 4–61, 4–64, 26A).[10]

Proper backcuts where adequate hinge wood and a platform are left will reduce the potential for such injuries (Ex. 4–5, 21D, 22, 38I). In fact, manual felling training materials entered into the record instruct fellers, for safety reasons, to place the backcut above the horizontal face cut (Ex. 4–5, 4–6, 4–10, 4–19, 4–169, 4–173, 5–1, 5–29, 8–18, 21, 29). Moreover, the record demonstrates that the primary reason that fellers prefer to place backcuts at the same level as the face cut is not because of safety, but rather because they do not want to have to make an additional cut to trim the log butt. However, there is no evidence in the record which

[10] It has been argued by some parties that placing the backcut above the horizontal face cut is only necessary in selective cutting operations, and not in clear cut operations. The reason they give is that in clear cut felling trees are felled into the downhill side of the slope and there is no danger the tree will kick back or fall against gravity in the wrong direction. However, the injury data in the rulemaking record do not support this position. According to the WIR survey, 62 percent of all injuries reported occurred in clear cut operations.

indicates that making an additional cut would have any significant impact on productivity.

The purposes of this standard are best realized by requiring that the backcut provide sufficient hinge wood to direct the fall of the tree, and that the backcut be above the horizontal face cut so a platform is formed. These safe manual felling practices will help to ensure the tree falls in the intended direction and does not kick back off the stump when the notch closes. OSHA is revising the final rule and compliance directive to more clearly reflect OSHA's intent that these work practices be followed.[11]

OSHA has not specified in the final rule how far above the face cut the backcut must be placed. By contrast, the Washington and Michigan logging standards require that the backcut be approximately 2 inches above the face cut to provide adequate hinge wood. On the other hand, the Oregon logging rule does not specify a minimum vertical distance. OSHA believes that a backcut placed at least one inch above the face cut should provide an adequate platform to prevent kickback and to allow the hinge to help steer the falling of the tree in the intended direction. 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.[12]

[11] OSHA notes that one safe technique for making the backcut is to start the backcut with a plunge cut/bore cut to establish the hinge. The backcut should then be moved toward the back of the tree. This backcut method provides for two holding points until the tree is finally released. This backcutting method will prevent the tree from releasing too soon or moving before the feller has moved to a point of safety. The record shows that this backcutting method is a safe technique for felling (Ex. 9–20), and OSHA suggests this technique when conditions such as, but not limited to, tree lean, slope, and large tree size indicate that felling the particular tree may present additional hazards.

[12] 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 kick back. OSHA stresses that this is due to the openness of the notch rather than the type of cutting method being employed. As such, OSHA is clarifying the compliance directive to indicate that 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.

Other Corrections and Clarifications

Paragraph (c)—Definitions

Logging operations. The definition of ''logging operations'' in the final rule includes ''marking'' operations. OSHA is revising this definition to clarify the type of marking operations covered by the logging standard. OSHA intended that marking include operations that are done attendant to and at the same time as felling, cutting and moving trees in a particular logging work site. Such 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 that tract whether and how to cut trees.

OSHA did not intend marking operations to include those operations that are done independently of or in advance of cutting trees in a particular logging site. These preparatory operations include marking of tracts of land to determine the order in which tracts will be logged, and marking and designating boundaries of tracts of land that will be bid upon for harvesting. Harvesting of trees does not take place on the tracts while these marking operations are being done. These preparatory operations do not involve the hazards of logging operations, and the record indicates that the high injury and fatality rates in the logging industry are not associated with these activities (e.g., Ex. 2–1). Therefore, OSHA is revising the compliance directive to indicate that marking activities which take place in advance of and separate from tree harvesting are not covered by the final logging rule.

For the same reasons, OSHA is also revising the compliance directive to specify that 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 if no tree harvesting is undertaken in the area at this time.

OSHA is also revising the definition of logging operation to more accurately express its intention about what transportation activities the Agency considers to be logging operations covered by the final rule. The final rule had stated that logging operations include transport of machines, equipment and personnel from one logging site to another. The Agency had intended the definition to include transportation of machines, equipment and personnel to and from as well as between logging sites. As discussed above, with regard to transportation of employees, the revised rule includes only their transportation in vehicles owned, rented or leased by the employer.

OSHA has been requested to clarify what loading and unloading operations are covered by the final rule. OSHA is revising the compliance directive to indicate more clearly that 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. 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 hazards associated with unloading trees at these worksites are addressed by these other standards, they apply instead of the final logging rule. For example, both the pulp mill and sawmill standards include provisions specifying how binders and stakes are to be released from the load of logs. As such, the similar provision contained in the logging final rule does not apply. However, to the extent that the final logging rule addresses hazards not covered by the pulp and saw mill standards, the logging rule applies if it is a logging operation. For example, neither the pulp mill or sawmill 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.

Machine. In the final rule OSHA included a definition of the machines covered by the logging rule. The definition included material handling equipment that is operated off-road. OSHA was asked to clarify whether the definition of logging machine includes aircraft, such as helicopters. OSHA never intended that logging machines include airplanes or helicopters and is clarifying its intention by expressly excluding airplanes and helicopters from the definition of machines covered by the final rule.

Paragraph (d)(1)(iii)—Gloves

The final rule specified that all loggers who handle wire rope must wear cotton gloves or other hand protection that the employer demonstrates provides equivalent protection. The proposed rule would have required employees to wear heavy-duty puncture resistant gloves such as leather. Many commenters said that such gloves would pose additional hazards and urged OSHA to permit employees to wear

cotton gloves (Ex. 5–17, 5–29, 5–54, 5–74 through 5–92; Tr. OR 104). They said that during winching leather gloves would not tear away when caught on a ''jagger'' (i.e., broken wires of a wire rope) and would forcibly pull the logger's hand. This could result in a more severe laceration of the hand, or could cause the employee to be dragged into the machinery or to fall. Thus, they said the leather glove could turn a minor injury into a more serious injury. Based on this, in the final rule OSHA specified that cotton gloves must be worn.

OSHA is correcting the final rule to indicate that it was not the Agency's intention, in specifying cotton gloves, that employees be permitted to have their hands on wire rope when winching is started or underway. OSHA emphasizes that employees are not permitted to be handling the winching line when the yarding machine is in operation. The final rule requires that they must be clear of the choked log *before* the yarding machine operator begins to winch the choked trees. Paragraph (h)(5)(i) of the final rule clearly requires that before any log is moved that employees must be in the clear. In addition, paragraph (h)(5)(v) requires that employees who assist with yarding (i.e., choking logs) must signal the machine operator that they are in the clear and the machine operator must not begin winching the load until he has clearly understood the received signal that other employees are in the clear (paragraph (h)(5)(v)). OSHA included these requirements because employees have been injured where logs being winched hit obstacles, causing them to swing suddenly and strike an employee (Ex. 2–1, 4–63, 4–64).

OSHA is making clear in the revised provision what hazards hand protection are intended to address—puncture wounds, cuts and lacerations that could occur from handling wire rope, especially rope with broken wires. Employers are free to use cotton gloves, provided they adequately address the hazards of handling wire rope. Employers are also free to use rubber gloves with cotton liners or leather gloves that protect employees from the hazards associated with handling wire rope as well as from extreme environmental conditions.

Paragraph (d)(1)(iv)—Leg Protection

Some parties requested OSHA to exempt from the leg protection requirement the incidental use of chain saws. However, OSHA has not made such an exemption because the record clearly does not support it.

As OSHA explained in the preamble of the final rule, the risk of injury from chain saw is present whenever a chain saw is being used (59 FR 51702). The WIR survey showed that 20 percent of injuries reported were chain-saw injuries (Ex. 2–1). 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. There is no evidence in the record that employees who only occasionally operate chain saws are not subject to these risks. 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, OSHA believes that leg and foot protection are needed whenever an employee is operating a chain saw. The revised compliance directive notes that the leg protection requirement applies to any employee who operates a chain saw for any amount of time.

OSHA realizes that protective material may be damaged or destroyed in the process of stopping a chain saw. Because of this, OSHA is revising the compliance directive to indicate that when 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 leg protection or logging boot, such equipment is no longer in serviceable condition. OSHA agrees with manufacturer warning labels that such cuts and tears in the protective material compromise the ability of the PPE to provide the level of protection which is necessary. OSHA is revising the compliance directive to specify that in such situations footwear and leg protection cannot be repaired and must be replaced with serviceable PPE.

Paragraph (d)(2)(i)—Location of First-Aid Kits

In the final rule, OSHA required that employers provide first-aid kits at each landing, on each employee transport vehicle, and at each worksite where felling is being conducted. After the final rule was published, OSHA was requested to clarify whether first-aid kits must be provided at both active and inactive landings. It was not OSHA's intention to require employers to provide first-aid kits at landings which are not currently in use. OSHA is correcting the final rule to clarify that the provision of first-aid kits at landings refers to only ''active'' landings.

OSHA was also requested to clarify at what point a felling work site is considered separate or remote from another work site, thus triggering the requirement for an additional first-aid kit. In the revised compliance directive, OSHA has indicated that where employees are cutting trees more than one-half mile from an active landing or an employee transport vehicle, a first-aid kit also must be provided at that work site. In these situations, the first-aid kits which are at the landing or on the vehicle are too distant to be considered immediately accessible.

The compliance directive also indicates that 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. Traveling under such conditions is likely to take far longer than under optimal conditions, thus rendering the first-aid kit too isolated to be of any prompt use. 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.

Finally, OSHA is also correcting the final rule to clarify which felling work sites need first-aid kits. In the final rule, OSHA stated that first-aid kits must be provided ''at each work site where felling is being conducted.'' It was OSHA's intention that felling work sites include any work site where trees are being cut; that includes limbing, bucking, and trimming as well as felling. The rulemaking record clearly shows there are a significant number of injuries wherever trees are being cut. For example, the WIR survey indicated that 23 percent of employees reporting injuries were felling trees and 27 percent were limbing and bucking felled trees (Ex. 2–1). Injuries to these employees are primarily due to chain saws or being hit by a falling or rolling tree. Because of the significant risk of injury, employees performing all of these logging operations need to have immediate access to a first-aid kit.

A further review of the record indicates that in many situations limbing and bucking are not done at the landing, but rather, at the place where the tree is felled (e.g., Ex. 4–63, 4–64, 26A). In addition, in-forest limbing and bucking is not always done near felling operations. For example, felling operations may be far from limbing and bucking crews. To the extent that a limbing or bucking work site is more than one-half mile from the nearest first-

aid kit (i.e., felling area, active landing, or employee transport vehicle), OSHA is clarifying that a first-aid kit must also be provided for that limbing or bucking work site.

Paragraph (d)(5)—Environmental Conditions

The final rule requires that employees terminate work and move to a safe location where environmental conditions may endanger them in that work or at a given location. While OSHA cannot specify every environmental condition that might necessitate employees moving to a place of safety, OSHA did provide a list of certain types of conditions that would create hazards for employees working in the area.

After publication of the final rule, OSHA was told that the provision was too broad and did not provide adequate instruction for compliance officers because it included conditions which did not pose a real possibility of danger for logging employees. However, OSHA believes that the final rule included clear examples of environmental conditions which would be considered dangerous for an exposed employee. Paragraph (d)(5) specifies that work stop and employees move to a place of safety in electrical storms (as opposed to rainy weather), dense fog (as opposed to pocket fog), heavy rain and snow (as opposed to wet weather), extreme cold (as opposed to cold weather), and mudslides (as opposed to muddy conditions). OSHA believes this list of extreme environmental conditions does identify hazardous conditions and provides adequate guidance for compliance officers.

It was also requested that OSHA revise these provisions to require that employees be moved to a place of safety only if winds were ''gale force.'' Gale force winds are defined as those which are at least 40 miles per hour. OSHA is aware, however, that even winds of less than gale force can significantly affect the fall of a tree, particularly if other adverse conditions are present (e.g., leaning tree, steep terrain, large tree, lodged tree, tree under pressure). As such, OSHA does not believe one specific wind speed is an appropriate indicator of whether an environmental hazard is present. However, OSHA is revising the final rule to more fully express the type of wind conditions it believes create a hazard for an employee working in the area. The final rule and compliance directive are being revised to indicate that all work must terminate and each employee shall move to a place of safety when strong winds which may adversely affect the fall of a tree are present.

OSHA also included fires among hazardous environmental conditions. Some parties have interpreted this example as requiring employees to leave the area any time a fire starts rather than putting out the fire. However, the final rule, viewed in its entirety, does not support that interpretation. For example, paragraph (d)(4), directly preceding the environmental conditions provision, requires employers to provide fire extinguishers on each machine and vehicle. This requirement contemplates that an employee may be called upon to put out a small fire which has started. However, if a fire were to start in an area where there is no fire extinguisher or other equipment or supplies which would allow the employee to safely suppress it, the employer would be responsible for assuring that the employee is moved out of the area of danger. 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 attempt to suppress the fire, the employer must also assure that employee is moved from the area of danger. OSHA notes that the standards on fire protection in subpart L of Part 1910, and not the revised logging standard, govern the fighting and suppression of fires at logging worksites.

Paragraph (d)(6)(iii)—Working Within Visual or Audible Contact

In the final rule, OSHA requires that each employee work within visual or audible contact of another employee. OSHA was requested to clarify whether this requirement applies only to employees working at a logging site or also to employees working away from logging work sites (e.g., logging vehicle operators transporting a load of logs off the logging site on public roads).

OSHA intended that this provision of the final rule apply to each employee working at a logging work site, including watchmen and other employees performing logging operations at remote logging work sites. OSHA did not intend the requirement to apply to vehicle operators who are not at the logging site, but rather driving vehicles miles away. However, this provision does apply to vehicle operators while they are at a logging work site. OSHA is revising the final rule to clarify its intention and to provide the exception for vehicle operators working away from the logging work site.

Paragraph (d)(6)(iv)—End of Workshift Accounting of Employees

The final rule requires that the employer account for each employee at the end of each workshift. OSHA was requested to provide additional clarification of this requirement in the revised compliance directive.

First, the employer need not personally conduct the actual end of shift accounting of each employee. The employer may delegate this task, but the employer remains ultimately responsible under the standard for assuring that employees are not inadvertently left in the woods, especially an employee who may be injured.

Second, this provision does not require employers to prohibit employees from remaining at the work site 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 was to assure that no employee, particularly an injured employee, be inadvertently left in the woods without assistance. The rulemaking record includes several reports of accidents in which employees were not discovered in a timely fashion and died (Ex. 4–64, 26A). The revised compliance directive also makes clear that after the workshift has ended and the employer has ascertained that the employee is done with work, including overtime work, and is safely accounted for, the final rule does not prohibit the employer from allowing the employee to remain in the area for personal reasons. OSHA is revising the compliance directive to reflect this.

Paragraph (d)(9)(i)—Storage and Handling of Flammable and Combustible Liquids

The final rule requires that flammable and combustible materials be stored, handled and transported (hereafter stored) in accordance with the requirements of subpart H of Part 1910. OSHA was requested to provide an exception from subpart H to allow logging machine operators to carry plastic cans of chain-saw fuel for refueling away from fueling stations, when necessary. Some parties have interpreted paragraph (d)(9) as prohibiting machine operators from storing and transporting logging machine fuel in 5-gallon plastic containers which are approved by Underwriters Laboratories (UL) or meet U.S. Department of Transportation (DOT) requirements. For the reasons discussed below, OSHA does not believe that an exception to subpart H

is necessary to allow the practice that these parties seek to authorize.

First, Subpart H permits Class IB liquids, which OSHA interprets as including chain-saw fuels, to be carried in 5-gallon plastic safety cans approved by UL or Factory Mutual (FM). Subpart H permits Class IB fuels to be carried in ''safety cans'' that have a maximum allowable size of 5 gallons (29 CFR 1910.106(d)). Safety cans are defined as containers approved by a nationally recognized testing laboratory (NRTL) and otherwise meeting the requirements of the definition. This requirement is broad enough to encompass plastic safety cans, provided that such containers are approved by a NRTL as meeting all the requirements of the definition. In response to concerns raised, OSHA also notes that UL and FM are recognized by the Agency as NRTLs for testing and listing equipment meeting the requirements of subpart H.

Second, subpart H also permits flammable and combustible liquids to be stored in containers meeting the requirements of regulations issued by the Hazardous Materials Regulations Board, Department of Transportation (*See,* 49 CFR 171–178). These regulations permit flammable liquids such as chain-saw fuel to be stored in plastic jerricans holding up to 5 gallons which meet DOT specifications for non-bulk packaging (*See,* 49 CFR 193.202(c) and 178.502).

Therefore, read in its entirety, the logging standard does not prohibit plastic safety containers under the conditions described above, and an exception is not necessary. OSHA is including this discussion in the revised compliance directive.

Paragraph (d)(9)(iii)—Machine Fueling

The final rule requires that tools, machines and vehicles be shut off during fueling. The purpose of this provision is to eliminate potential sources of ignition when handling flammable and combustible liquids in order to prevent a fire from erupting.

OSHA is revising the rule to permit diesel-powered machines and vehicles to be fueled while at idle, provided that continued operation is intended and that the employer follows safe fueling and operating procedures. OSHA believes this exception is warranted because the hazard which this provision seeks to address, sudden flash fires, is typically not present during fueling of diesel-powered engines. This is because diesel fuel has a higher flash point than that of gasoline, and unlike gasoline its vapors do not evolve as suddenly. In fact, in many cases diesel fuel must be heated before it will give off sufficient vapors to ignite. As such, there is little potential for fire if a diesel-powered engine is running during fueling.

At the same time, however, OSHA is requiring that other safe fueling and operating procedures be followed during fueling of diesel-powered machines and vehicles. OSHA is revising the compliance directive to indicate that employers must train employees in safe practices during fueling. These include vapor containment, spill prevention, and other procedures the operator must follow when leaving the machine cab to fuel the engine.

Paragraph (d)(9)(iv)—Starting Fires

The final rule required that flammable and combustible liquids not be used to start fires. The purpose of this provision was to prevent fires being started by employees from erupting and burning them and others.

After publication of the rule, OSHA was requested to allow fires to be started with chain-saw fuel, which is a flammable liquid, provided that the fuel was not used in an unsafe manner or in a situation which might create a hazard for any employee. OSHA agrees that the rulemaking record does not identify the use of chain-saw fuel to start fires as a major cause of accidents and injuries in the logging industry (e.g., Ex. 2–1). However, the record does indicate that using chain-saw fuel can create a hazard in certain situations. For example, a Forest Products Accident Prevention Association (FPAPA) Industry Alert reported that employees suffered third-degree burns when a fire in a warming hut was reignited with chain-saw fuel and caused an explosion (Ex. 4–64). In that case, an employee had added wood and chain-saw fuel to a woodstove which had been started earlier in the day. The coals left over from the earlier fire vaporized the fuel and then ignited it. The action that the employer could have taken to prevent the accident included prohibiting the use of chain-saw fuel to start a fire in an enclosure. In addition, according to FPAPA, the accident could have been prevented if the employer had trained the workers about the hazards of improper fuel handling.

OSHA is revising the final rule to allow flammable and combustible liquids, such as chain-saw and diesel fuel, to be used to start a fire. OSHA believes that this flexibility will allow piles of wood or slash to be burned when permitted by forestry officials. 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. OSHA agrees with FPAPA that employers must train employees to know under what conditions it is safe to start a fire with chain-saw fuel and those situations in which using fuel may create a hazard for an employee. In the compliance directive OSHA is indicating particular situations in which starting a fire with chain-saw fuel would not be safe. For example, using chain-saw fuel to start a fire in an enclosure is not safe. There is a greater chance that fuel vapors may collect in the enclosed area and ignite or cause an explosion. The record shows 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 are available.

Paragraph (e)(2)(iv)—Refueling Chain Saws

The final rule required that chain saws be fueled at least 20 feet from any open flame or other source of ignition and started at least 10 feet from the fueling area. The purpose of these provisions is to assure that chain-saw fuel was kept a minimum safe distance from any potential source of ignition.

After publication of the final rule, some parties pointed out that OSHA had established two different minimum safe distances between fuel and ignition sources—20 feet between fueling areas and ignition sources, and 10 feet between fueling areas and chain saw startup, which is another potential source of ignition. They urged OSHA to establish a uniform safe distance and recommended that OSHA adopt a 10-foot minimum safe distance. While OSHA believes that an open fire is a much more likely source of ignition than a chain saw being started, nonetheless OSHA believes that a 10-foot distance is adequate in both situations. This is because in the out-of-doors, where constant air movement dissipates vapors, it would be unlikely there could be a concentration of flammable vapors sufficient to cause an increased potential for fire at a distance greater than 10 feet. Therefore OSHA is revising the final rule and compliance directive to establish a 10-foot minimum safe distance between fueling areas and potential sources of ignition.

Paragraph (e)(2)(vi)—Starting Chain Saws

The final rule requires that chain saws be started on the ground or where otherwise firmly supported. OSHA was requested to clarify expressly in the regulatory text whether ''drop starting''

a chain saw is prohibited under the final rule, and whether operators are allowed to start the chain saw while standing in an upright stance.

In the preamble to the final rule, OSHA explained that the purpose of this requirement was to assure that employees did *not* attempt to drop start chain saws. As noted in that discussion, an employee could lose his grip when drop starting a chain saw and the saw could fly upward and cut the employee. Nonetheless, OSHA is amending the final rule to emphasize the Agency's intention that drop starting of chain saws is prohibited.

With regard to employee position during chain-saw start up, nothing in the final rule prohibits an employee from standing in 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 with the final rule if he rested the chain saw firmly on a log or other stationary item and started the chain saw while standing upright. OSHA notes that such a starting position is a safe technique because it provides protection both from chain saw kickback and from overexertion of the back.

Paragraph (e)(2)(xii)—Carrying Chain Saws

The final rule requires that chain saws be carried in a manner that will prevent operator contact with the cutting chain and muffler. OSHA's intention is to assure that chain-saw operators are not cut by the saw or burned by the hot muffler when carrying the chain saw between felling points.

The record indicates there are certain devices currently available and used in the logging industry to prevent cuts and burns (Ex. 5–21, 5–36, 5–63), including leather and felt shoulder pads. By citing these examples, OSHA did not intend to imply that these particular devices are required by the final rule. In fact, OSHA expressly stated in the preamble that ''any other method of carrying the chain saw that prevents these hazards would also meet this requirement'' (59 FR 51713). OSHA is including this clarification in the revised compliance directive.

Paragraph (e)(2)(xiii)—Retreating With Chain Saws

The final rule required that after cutting a tree the feller must shut off or idle the chain saw before beginning his retreat. OSHA's intention was to help assure that employees are not cut by a running chain saw when they are moving quickly to a safe distance from the falling tree. As discussed in the preamble, a significant number of chain-saw injuries result from falling on the saw or losing the grip on a running saw (Ex. 2–1). As a result, any time a feller moves with a chain saw, precautions must be taken to prevent contact with the moving chain. These precautions include shutting off the saw, engaging the chain brake, or idling the engine by releasing pressure on the throttle and grasping the front handle.

It has been pointed out to OSHA that it takes a moment's delay for a saw to idle down once the throttle is released. As was noted in the rulemaking record ''[t]he cutter may lose precious seconds worrying about compliance with the * * * standard, meanwhile a life could be in danger'' (Ex. 5–50). It is not OSHA's intention that the feller be 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, OSHA's intention is that 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. Once the throttle is released, it should only take a brief moment a properly maintained chain saw to stop. OSHA is revising the final rule and compliance directive to more accurately express OSHA's intention.

Paragraph (f)(3)(i)—Protective Structures for Logging Machines

The final rule requires that the following logging machines placed into initial service after February 9, 1995, have FOPS and/or ROPS: tractors, skidders, swing yarders, log stackers and mechanical felling devices. OSHA intended that the term ''log stackers'' be viewed as a general term covering any logging machine that stacks logs during loading and unloading. However, the more common term used in the industry to refer to machines that load and unload logs is ''log loader.'' OSHA is therefore revising the final rule to clarify that paragraph (f)(3)(i) covers log loaders.

Paragraph (h)(1)(ii)—Unfamiliar or Unusually Hazardous Conditions

This section requires that the immediate supervisor be consulted for approval when unfamiliar or unusually hazardous conditions are encountered before cutting is commenced. OSHA included this provision in the final rule because the record indicates that many injuries occur when inexperienced employees encounter unfamiliar situations, and even when experienced loggers believe they can handle particularly hazardous situations on their own (Ex. 2–1, 4–63, 4–64, 26A).

OSHA was requested to clarify the situations which are intended to be covered by this provision. While OSHA cannot provide an exhaustive list of the situations which may necessitate the employee consulting with a supervisor, there are certain situations which are clearly covered by this paragraph. These situations include worsening weather conditions (e.g., weather changes 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. These are situations in which loggers have been killed or severely injured because the conditions caused unexpected results during felling (Ex. 2–1, 4–63, 4–64, 26A). When these conditions arise, adding the supervisor's knowledge, training, and experience to the decisionmaking process should help minimize the hazards to which the logger may be exposed.

In addition to such consultation, it is also important in training for employers to train their new employees that when they encounter situations with which they have not dealt before, they need to work with the supervisor to safely handle the situation. This concept should also be reinforced in regular safety and health meetings.

Paragraph (h)(1)(iii)—Felling Distances

The final rule requires that while manual felling is in progress, yarding machines must not be operated within two tree lengths of the trees being manually felled. OSHA's intention was to assure that neither the yarding machine operator nor the manual feller is injured because of the independent actions of the other. For example, the feller may not be conscious of the fact that the yarding machine operator has entered the area to remove the tree which the feller has just cut. This work practice requirement helps to assure that yarding machine operators are not hit by other trees the feller or felling team has begun to cut.

After the final rule was published, OSHA was requested to clarify whether this provision prohibits tree pulling by teams of employees. Tree pulling was not intended to be prohibited under paragraph (h)(1)(iii). Indeed, paragraph (h)(1)(iv) addresses tree harvesting by employee teams, and sets forth procedures which must be followed where a team is necessary to fell a tree. In any event, OSHA is correcting the final rule to provide an explicit exception to paragraph (h)(1)(iii) for tree pulling operations. OSHA is also

revising the compliance directive to indicate that the procedures governing team felling also apply in tree pulling operations.

Paragraph (h)(1)(ix)—Domino Felling

The final rule prohibits domino felling. OSHA defined domino felling in the final rule as ''[t]he partial cutting of *multiple* trees which are left standing and then *pushed over with a pusher tree.*'' In the preamble OSHA explained that domino felling was a method of attempting to fell a line or row of trees by partially cutting the trees and then pushing the end tree into the others, thereby creating a domino falling effect. (59 FR 51699, 51724). There was considerable evidence in the rulemaking record that such a method of felling a group of trees is extremely dangerous because there is greater likelihood the line of trees will not fall in the intended direction or may not fall completely, thereby creating even greater hazards (Ex. 5–42, 5–46; Tr. W2 231, OR 659). The hazards associated with domino felling are further increased where a danger tree is among the line or row of trees to be felled using this chain reaction method. Therefore, OSHA emphasized that danger trees also could not be felled using domino felling.

After publication, OSHA was requested to further clarify whether the felling of a single danger tree by felling another single tree into it is prohibited under the final rule. The final rule does not prohibit this practice in all cases, since the definition of domino felling in the final rule 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 a pusher tree. OSHA is revising the final rule to identify practices which are not considered to be domino felling, and therefore, are not prohibited by the standard.

However, the practice of felling a danger tree by felling another one into it, while it is not prohibited, is not automatically permitted to be used whenever a danger tree is felled. Paragraph (h)(1)(vii) of the final rule 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, and may even increase the risk the feller faces in removing the danger tree. As OSHA pointed out in the preamble, commenters told OSHA that felling a danger tree by felling another one into it is a safe technique when used by an experienced feller, but only ''in certain situations'' (Ex. 5–74 through 5–92). Other commenters told OSHA that this technique is generally not considered safe practice (Ex. 5–42, 5–46). In clarifying that this technique is not prohibited under the final rule, OSHA is permitting that a danger tree be felled in this manner only where a careful examination of mechanical techniques is first made and where it is also determined that the hazards felling the danger tree in this manner can be sufficiently minimized. The revised compliance directive notes that felling a danger tree by this method does not always minimize employee exposure to the hazard under paragraph (h)(1)(vii), and emphasizes that a safer method to remove a danger tree is to pull the tree down with a skidder or mechanical feller (Ex. 5–43).

Paragraph (h)(2)(i)—Retreat Paths

The final rule requires that a feller must plan and clear a retreat path before he begins cutting a tree. This provision assures that the feller has an accessible path for moving away from the falling tree, especially if the tree falls in an unintended direction. The rulemaking record indicates that a significant number of injuries have resulted from not having a clear retreat path. For example, the WIR survey indicates that almost 15 percent of logging injuries reported resulted from loggers misjudging the time and distance required to move to a safe place (Ex. 2–1).

It has been pointed out to OSHA that while this provision requires employees to plan and clear a retreat path, it does not expressly state that the feller must take that retreat path a safe distance from the falling tree once the tree is cut. While OSHA is confident that the vast majority of employers and fellers understand the purpose of the retreat path, OSHA is correcting the final rule to make the retreat requirement explicit.

Paragraph (h)(3)(i)—Limbing and Bucking

The final rule requires that whenever rolling or sliding of the tree is reasonably foreseeable, limbing and bucking must be done on the uphill side of the tree. While it is possible to limb and buck from the uphill side in almost all situations, the Agency provided an exception for those cases where the employer demonstrated that it was not feasible to limb or buck from the uphill side. In those limited cases, the provision required that the tree be secured with chocks to prevent rolling, sliding or swinging.

After publication of the final rule, OSHA was told by various parties that they knew of no cases where manual bucking and limbing from the uphill side would be infeasible. They also said that the procedure of setting chocks itself would put the employee in a dangerous position. Therefore, they told OSHA that the exception allowing work on the downhill side should be deleted from the final rule.

A review of the rulemaking record supports these comments. There were no comments or hearing testimony identifying any situations in which it would be infeasible to buck or limb a tree from the uphill side. Moreover, the Agency is aware that machines can move trees to a stable position so there is no potential for rolling of the tree during limbing and bucking. Therefore, OSHA agrees that the exception to allow limbing and bucking from the downhill side is unnecessary, and is correcting the final rule to remove it.

Paragraph (h)(5)(v)—Yarding

The final rule requires that yarding lines not be moved unless the yarder operator has clearly received and understood the signal. This provision also specifies that when in doubt, the machine operator must repeat the signal and wait for a confirming signal before moving the line. OSHA intended the term ''yarder operator'' to be a generic reference to any employee operating a machine used for yarding, including a yarder or skidder. However, since a yarder is also a specific kind of yarding machine, the provision could be read as applying only to the operator of that particular type of machine. Because of the potential for misinterpretation, OSHA is correcting the final rule to more clearly express the Agency's intention that the provision apply to all machines used for yarding felled trees.

Paragraph (h)(5)(viii)—Hazardous Obstructions in Yarding

The final rule requires that yarding machines or vehicles and their loads must be operated with safe clearance from all obstructions. This provision was included in the proposed rule and there were no comments opposing it. However, after publication of the final rule, OSHA received requests for clarification of the language and scope of this provision.

OSHA is revising the final rule and compliance directive to more clearly define the hazards being addressed by this provision. OSHA intended that yarding machines and their loads be operated in a manner that prevents contact with *hazardous* obstructions. The types of obstructions which the record shows to be hazardous include, but are not limited to, boulders, danger

trees, stumps, log piles, power lines, and cable rigging (Ex. 2–1, 4–61, 4–64, 26A). OSHA is also revising the compliance directive to include examples of hazardous obstacles that have resulted in employee death and injury.

Paragraph (h)(6)(ii)—Loading

The final rule requires that only the machine operator and other essential personnel 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 site (e.g., landing). OSHA is correcting the final rule and compliance directive to express more clearly the Agency's intention.

Paragraph (i)(7)(i)—First-Aid Training

The final logging rule requires the employer to assure that each employee receives or has received first-aid training, including CPR, which meets the minimum requirements set forth in mandatory Appendix B. OSHA was requested by some parties to clarify whether the provision requires employers to provide new employees with first-aid training before they are allowed to begin work, and if so, to permit employers to have a 90-day training phase-in period for new employees.

The final rule does not require employers to provide the first-aid training to their employees. Employers are only required to assure that every employee performing logging operations has a first-aid training certificate which is current. Employers are free to require, as a condition of employment, that new employees have or obtain a first-aid training certificate. As the rulemaking record indicates, there are many organizations, schools, extension services, and others throughout the country which provide first-aid training on a continuous basis.

At the same time, OSHA is aware that some employers do provide first-aid certificate training for new employees who do not have a current first-aid training certificate. Where employers elect to provide such training, the general training requirements of paragraph (i) require that it be provided prior to the employee's initial assignment. It is vital that new and untrained employees not be allowed to begin work until they have been trained.

Remote and isolated locations are typical of logging operations. If employees working in these locations do not have the necessary first-aid training, they would not be able to help themselves or others if an accident were to occur. For example, one fatality report submitted by APA involved a feller being sent to work alone in an isolated area (Ex. 26A). The feller suffered a cut to the upper leg and did not perform any first-aid on himself. Instead, he attempted to walk out of the woods but bled to death before he was found. Teaming an untrained employee with a trained logger would not solve the problem. In case of emergency, the untrained employee would not be able to provide first-aid assistance if it were his trained partner that was injured. Many crews work in pairs in remote areas and each crew member needs to be trained to help his partner.

Therefore, OSHA is not allowing a phase-in period for first-aid training. The employer is responsible for assuring that untrained employees have had first-aid training prior to initial assignment or, in the case of current employees, by the effective date of the final rule. OSHA believes that the logging rule can best reduce the number and severity of logging injuries if employees have a current first-aid training certificate before they begin logging operations.

Paragraph (i)(7) (ii) and (iii)—Frequency of First-Aid Training

The final rule requires employers to assure that each logging employee receives first-aid training at least every three years and CPR training at least annually. The final rule also requires the employer to assure that each employee's first-aid and CPR training certificate remain current. It has been suggested to OSHA that CPR training is only necessary every three years. For the following reasons, OSHA believes that the record does not support such a change.

As OSHA explained in the preamble to the final rule, the American Red Cross first-aid training program, which is the most widely used program in the country, requires first-aid training every three years and annual CPR training in order to maintain a current certificate (Ex. 5–42). The American Heart Association follows the same requirements for maintaining current certification. The American Medical Association also recommends following the training procedures established by the American Red Cross and the American Heart Association. In addition, States have established minimum requirements for first-aid training certification.

While OSHA is aware that some States only require CPR training every two years to maintain a current certificate (e.g., Idaho), there are no States which permit CPR certificates to remain current for three years. OSHA is correcting the final rule to conform its retraining requirements to the requirements established by State regulations and organizations that provide first-aid and CPR certificate training programs. Therefore, as long as the employer assures that each employee has a current first-aid and CPR training certificate which meet State requirements or the requirements of certifying organizations, the employer is in compliance with the final rule. To reflect this clarification, OSHA is deleting paragraph (i)(7)(ii) and redesignating paragraph (i)(7)(iii) as paragraph (i)(7)(ii).

Appendix A to Section 1910.266—First-Aid Kits (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.

After publication of the final rule, OSHA was requested by some parties to drop tourniquets from the required list of items in first-aid kits. They told OSHA that current first-aid training courses teach people to use direct pressure to stop bleeding and to avoid the use of tourniquets in all but the most severe cases or when no other method will work. They were concerned that if tourniquets were included in logging first-aid kits, their use would be encouraged rather than discouraged. While OSHA is confident that employees trained and certified in proper first-aid techniques will use tourniquets properly, OSHA is also aware that other items commonly present at logging sites could be used as tourniquets (e.g., belts, ropes) if the need arose. Therefore, OSHA is correcting the final rule to delete tourniquets from the mandatory appendix specifying required first-aid contents.

OSHA is also deleting recordkeeping forms from the list of mandatory first-aid kit contents. The recordkeeping forms referred to here were not OSHA 200 accident logs; rather, they were forms that would provide information for the health care provider about the employee's injury and condition if medical attention is necessary and the employee is unable to communicate. Nonetheless, OSHA is removing this requirement to avoid confusion with recordkeeping that is required in accidents and injuries in general. At the same time, OSHA emphasizes that employers should establish a method for communicating to health care providers information concerning injured employees.

OSHA is also deleting the requirement that first-aid kits contain diphenhydramine hydrochloride elixir or capsules (i.e., Benadryl). Even though this over-the-counter medicinal product is frequently used in the logging industry to reduce the effects of insect bites and bee stings, prescribing its use is beyond the scope of first-aid training in this standard.

The requirement that each first-aid kit contain blankets is being revised to indicate that each kit must, at a minimum, contain at least one blanket. OSHA intended the term blankets to be used generically and not to set forth a required number of blankets which must be present.

Finally, OSHA is correcting the splint requirement in Appendix A. In the final rule OSHA had specified that first-aid kits be equipped with wire splints. However, the rulemaking record indicates that other types of splints would be as effective as wire splints and OSHA did not intend to preclude their use. These include, for example, inflatable or air splints. This correction will provide more flexibility for employers in providing first-aid kits that incorporate the latest medical technology and innovations.

Need for Correction

As discussed above, the final rule on Logging Operations published on Oct. 12, 1994 (59 FR 51672) contains errors which may prove to be misleading and are in need of clarification.

Under 5 U.S.C. 553, OSHA finds that there is good cause for making these amendments and corrections to the final logging standard effective upon publication in the **Federal Register**. These amendments represent minor changes and clarifications to the final rule and they do not increase regulatory burdens over those imposed by the final logging standard.

List of Subjects in 29 CFR Part 1910

Chain saw, Forestry, Harvesting, Incorporation by reference, Logging, Occupational safety and health, Pulpwood timber, Safety, Training.

Accordingly, 29 CFR Part 1910 is revised by making the following corrections and technical amendments:

PART 1910—[AMENDED]

1. The authority citation for subpart R of part 1910 continues to read:

Authority: Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059), 9–83 (48 FR 35736) or 1–90 (55 FR 9033), as applicable.

Sections 1910.261, 1910.262, 1910.265, 1910.266, 1910.267, 1910.268, 1910.269, 1910.272, 1910.274 and 1910.275 also issued under 29 CFR Part 1911.

2. In paragraph (c) of 1910.266, the definitions of ''logging operations,'' ''machine,'' and ''vehicle'' are revised to read:

§ 1910.266 Logging Operations.

* * * * *

(c) * * *

Logging operations. Operations associated with felling and moving trees and logs from the stump to the point of delivery, such as, but not limited to, marking danger trees and trees/logs to be cut to length, felling, limbing, bucking, debarking, chipping, yarding, loading, unloading, storing, and transporting machines, equipment and personnel to, from and between logging sites.

* * * * *

Machine. A piece of stationary or mobile equipment having a self-contained powerplant, that is operated off-road and used for the movement of material. Machines include, but are not limited to, tractors, skidders, front-end loaders, scrapers, graders, bulldozers, swing yarders, log stackers, log loaders, and mechanical felling devices, such as tree shears and feller-bunchers. Machines do not include airplanes or aircraft (e.g., helicopters).

* * * * *

Vehicle. A car, bus, truck, trailer or semi-trailer owned, leased or rented by the employer that is used for transportation of employees or movement of material.

* * * * *

§ 1910.266 [Amended]

3. Section 1910.266 is amended by revising paragraph (d)(1)(iii); the first sentence of paragraph (d)(1)(iv); the first sentence of paragraph (d)(1)(v); paragraph (d)(1)(vii); the first sentence of paragraph (d)(2)(i); and paragraphs (d)(2)(iii), (d)(5), (d)(6)(iii), (d)(9)(iii), and (d)(9)(iv) to read:

(d) * * *

(1) * * *

(iii) The employer shall provide, at no cost to the employee, and assure that each employee handling wire rope wears, hand protection which provides adequate protection from puncture wounds, cuts and lacerations.

(iv) The employer shall provide, at no cost to the employee, and assure that each employee who operates a chain saw wears leg protection constructed with cut-resistant material, such as ballistic nylon. * * *

(v) The employer shall assure that each employee wears foot protection, such as heavy-duty logging boots that are waterproof or water repellant, cover and provide support to the ankle. The employer shall assure that each employee who operates a chain saw wears foot protection that is constructed with cut-resistant material which will protect the employee against contact with a running chain saw. * * *

* * * * *

(vii) The employer shall provide, at no cost to the employee, and assure that each employee wears the following:

(A) Eye protection meeting the requirements of subpart I of Part 1910 where there is potential for eye injury due to falling or flying objects; and

(B) Face protection meeting the requirements of subpart I of Part 1910 where there is potential for facial injury such as, but not limited to, operating a chipper. Logger-type mesh screens may be worn by employees performing chain-saw operations and yarding.

Note to paragraph (d)(1)(vii): The employee does not have to wear a separate eye protection device where face protection covering both the eyes and face is worn.

(2) * * *

(i) The employer shall provide first-aid kits at each work site where trees are being cut (e.g., felling, bucking, limbing), at each active landing, and on each employee transport vehicle. * * *

* * * * *

(iii) The employer also may have the number and content of first-aid kits reviewed and approved annually by a health care provider.

* * * * *

(5) *Environmental conditions.* All work shall terminate and each employee shall move to a place of safety when environmental conditions, such as but not limited to, electrical storms, strong winds which may affect the fall of a tree, heavy rain or snow, extreme cold, dense fog, fires, mudslides, and darkness, create a hazard for the employee in the performance of the job.

(6) * * *

(iii) Each employee performing a logging operation at a logging work site shall work in a position or location that is within visual or audible contact with another employee.

* * * * *

(9) * * *

(iii) Each machine, vehicle, and portable powered tool shall be shut off during fueling. Diesel-powered machines and vehicles may be fueled while they are at idle, provided that continued operation is intended and that the employer follows safe fueling and operating procedures.

(iv) Flammable and combustible liquids, including chain-saw and diesel

fuel, may be used to start a fire, provided the employer assures that in the particular situation its use does not create a hazard for an employee.

* * * * *

4. Section 1910.266 is amended by revising paragraphs (e)(2)(iv), (e)(2)(vi) and (e)(2)(xiii) to read:

(e) * * *

(2) * * *

(iv) The chain saw shall be fueled at least 10 feet (3 m) from any open flame or other source of ignition.

* * * * *

(vi) The chain saw shall be started on the ground or where otherwise firmly supported. Drop starting a chain saw is prohibited.

* * * * *

(xiii) The chain saw shall be shut off or the throttle released before the feller starts his retreat.

* * * * *

5. Section 1910.266 is amended by revising paragraphs (f)(2)(iv), (f)(2)(x) and (f)(2)(xi); the first sentence of (f)(3)(i); by removing the first sentence of (f)(3)(ii); redesignating the remaining text as paragraph (f)(3)(ii)(C) and adding paragraphs (f)(3)(ii) (A) and (B); and by revising paragraphs (f)(3)(vii), (f)(3)(viii) and (f)(7) (i) and (ii) to read:

(f) * * *

(2) * * *

(iv) To maintain stability, the machine must be operated within the limitations imposed by the manufacturer as described in the operating and maintenance instructions for that machine.

* * * * *

(x) Before the operator leaves the operator's station of a machine, it shall be secured as follows:

(A) The parking brake or brake locks shall be applied;

(B) The transmission shall be placed in the manufacturer's specified park position; and

(C) Each moving element such as, but not limited to blades, buckets, saws and shears, shall be lowered to the ground or otherwise secured.

(xi) If a hydraulic or pneumatic storage device can move the moving elements such as, but not limited to, blades, buckets, saws and shears, after the machine is shut down, the pressure or stored energy from the element shall be discharged as specified by the manufacturer.

* * * * *

(3) * * *

(i) Each tractor, skidder, swing yarder, log stacker, log loader and mechanical felling device, such as tree shears or feller-buncher, placed into initial service after February 9, 1995, shall be equipped with falling object protective structure (FOPS) and/or rollover protective structure (ROPS). * * *

(ii) (A) ROPS shall be tested, installed, and maintained in serviceable condition.

(B) Each machine manufactured after August 1, 1996, shall have ROPS tested, installed, and maintained in accordance with the Society of Automotive Engineers SAE J1040, April 1988, ''Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines.'' * * *

* * * * *

(vii) Each machine manufactured after August 1, 1996, shall have a cab that is fully enclosed with mesh material with openings no greater than 2 inches (5.08 cm) at its least dimension. The cab may be enclosed with other material(s) where the employer demonstrates such material(s) provides equivalent protection and visibility. Exception: Equivalent visibility is not required for the lower portion of the cab where there are control panels or similar obstructions in the cab, or where visibility is not necessary for safe operation of the machine.

(viii) Each machine manufactured on or before August 1, 1996 shall have a cab which meets the requirements specified in paragraph (f)(3)(vii) or 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 objects;

(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.

* * * * *

(7) * * *

(i) Service brakes shall be sufficient to stop and hold each machine and its rated load capacity on the slopes over which it is being operated.

(ii) Each machine placed into initial service on or after September 8, 1995 shall also be equipped with: back-up or secondary brakes that are capable of stopping the machine regardless of the direction of travel or whether the engine is running; and parking brakes that are capable of continuously holding a stopped machine stationary.

6. Section 1910.266 is amended by revising paragraphs (g)(1) and (g)(2) to read:

(g) * * *

(1) The employer shall assure that each vehicle used to perform any logging operation is maintained in serviceable condition.

(2) The employer shall assure that each vehicle used to perform any logging operation is inspected before initial use during each workshift. Defects or damage shall be repaired or the unserviceable vehicle shall be replaced before work is commenced.

* * * * *

7. Section 1910.266 is amended by revising paragraphs (h)(1)(iii), (h)(1)(ix), (h)(2)(i), (h)(2)(vi), and (h)(2)(vii); the heading of paragraph (h)(3); and paragraphs (h)(3)(i), (h)(5)(v), (h)(5)(viii), and (h)(6)(ii) to read:

(h) * * *

(1) * * *

(iii) While manual felling is in progress, no yarding machine shall be operated within two tree lengths of trees being manually felled. Exception: This provision does not apply to yarding machines performing tree pulling operations.

* * * * *

(ix) Domino felling of trees is prohibited.

Note to paragraph (h)(1)(ix): The definition of domino felling does not include the felling of a single danger tree by felling another single tree into it.

(2) * * *

(i) Before felling is started, the feller shall plan and clear a retreat path. The retreat path shall extend diagonally away from the expected felling line unless the employer demonstrates that such a retreat path poses a greater hazard than an alternate path. Once the backcut has been made the feller shall immediately move a safe distance away from the tree on the retreat path.

* * * * *

(vi) A backcut shall be made in each tree being felled. The backcut shall leave sufficient hinge wood to hold the tree to the stump during most of its fall so that the hinge is able to guide the tree's fall in the intended direction.

(vii) The backcut shall be above the level of the horizontal facecut in order to provide an adequate platform to

prevent kickback. Exception: The backcut may be at or below the horizontal facecut in tree pulling operations.

Note to paragraph (h)(2)(vii): This requirement does not apply to open face felling where two angled facecuts rather than a horizontal facecut are used.

(3) *Limbing and bucking.* (i) Limbing and bucking on any slope where rolling or sliding of trees or logs is reasonably foreseeable shall be done on the uphill side of each tree or log.

* * * * *

(5) * * *

(v) No yarding line shall be moved unless the yarding machine operator has clearly received and understood the signal to do so. When in doubt, the yarding machine operator shall repeat the signal and wait for a confirming signal before moving any line.

* * * * *

(viii) The yarding machine or vehicle, including its load, shall be operated with safe clearance from all obstructions that may create a hazard for an employee.

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(6) * * *

(ii) Only the loading or unloading machine operator and other personnel the employer demonstrates are essential shall be in the loading or unloading work area during this operation.

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8. Section 1910.266 is amended by removing paragraph (i)(7)(ii) and redesignating paragraph (i)(7)(iii) as paragraph (i)(7)(ii).

9. Section 1910.266 is amended by revising Appendix A to read:

Appendix A to 1910.266—First-Aid Kits (Mandatory)

The following list sets forth the minimally acceptable number and type of first-aid supplies for first-aid kits required under paragraph (d)(2) of the logging standard. The contents of the first-aid kit listed should be adequate for small work sites, consisting of approximately two to three employees. When larger operations or multiple operations are being conducted at the same location, additional first-aid kits should be provided at the work site or additional quantities of supplies should be included in the first-aid kits:

1. Gauze pads (at least 4×4 inches).
2. Two large gauze pads (at least 8×10 inches).
3. Box adhesive bandages (band-aids).
4. One package gauze roller bandage at least 2 inches wide.
5. Two triangular bandages.
6. Wound cleaning agent such as sealed moistened towelettes.
7. Scissors.
8. At least one blanket.
9. Tweezers.
10. Adhesive tape.
11. Latex gloves.
12. Resuscitation equipment such as resuscitation bag, airway, or pocket mask.
13. Two elastic wraps.
14. Splint.
15. Directions for requesting emergency assistance.

This document was prepared under the direction of Joseph A. Dear, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue NW., Washington, DC 20210.

Signed at Washington, DC, this 5th day of September, 1995.

Joseph A. Dear,

Assistant Secretary of Labor.

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