

I. RECOMMENDATIONS FOR AN OCCUPATIONAL STANDARD FOR LOGGING
FROM FELLING TO FIRST HAUL

The National Institute for Occupational Safety and Health (NIOSH) recommends that safety for logging be promoted by adherence to the following sections. Sufficient technology exists to permit compliance with the recommended standard. The criteria and standard will be subject to review and revision as necessary.

Section 1 - Definitions

The following definitions were taken or adapted from 29 CFR 1910.266, and from various logging codes, texts, and training courses. [1-12]

Arch	Rear section of a tractor yarder, generally U-shaped. Serves as a boom or hoist and raises leading end of logs off the ground for hauling through the woods.
Backcut (felling cut)	Final cut in felling a tree. Made on the side opposite the undercut and direction of fall (Figure I-4).
Ballistic Nylon	Fabric of high tensile properties designed to provide protection from lacerations.
Balloon Logging	Cable logging system which uses a lighter-than-air craft to provide vertical lift to a turn of logs as it is towed by the yarder to the landing.
Barberchair	Vertical split of a tree due to improper felling technique.
Bight	Area within the curve when a line or rope is curved.

Binder	Chain or wire rope used to bind a load of logs.
Block	Pulley used in cable logging to change direction of motion or increase pulling power.
Brow Log	Log placed parallel to any roadway at a landing or dump to protect carriers while loading or unloading.
Buck	To saw felled trees into shorter lengths.
Bucker	One who saws felled trees into shorter lengths.
Buddy System	Procedure in which two workers are always within sight and/or sound of each other.
Bunk	Cross supports on which the logs rest on a logging car or truck.
Cant Hook	Stout wooden lever used for rolling logs in which the tip is fitted with a curved metal hook.
Calked Boots	Boots containing steel calks or spikes in the heel and soles.
Chain Brake	Safety device which stops the saw chain.
Chain Saw	Saw powered by an engine or motor in which the cutting elements are on a circular chain.
Choker	Short length of wire rope that forms a noose around the end of a log to be skidded and is attached to the skidding vehicle or to the skidding line.
Choker Setter	One who attaches chokers to logs.
Coupling Pole (reach)	Rod or beam which connects a trailer to a motorized logging truck.
Cutter (feller, buckler)	One who fells, bucks or limbs, trees.
Cutting	The process of felling, bucking or limbing trees.
Cutting Area	Area on which the trees have been, are being, or are to be, cut.
Deck	File of logs.

Directional Felling	Application of a felling technique to control the direction of fall of a tree.
Dog	Short metal stake, one end of which is sharp for driving into a log and the other with an eye for attaching to another log.
Dogs, Saw	Metal plate containing three to five points or fingers located in front of the chain saw housing, protruding parallel with the bar. They act as a pivot point for the saw during cutting.
Fell (cut)	Process of severing a tree from the stump so that it drops to the ground.
Fellers	Workers who cut down trees.
First Haul	Transportation from the yard (landing) after the initial loading operations have been completed.
Grapple	(1) Device at the working end of a line or boom used to pick up and hold the load. (2) Two small iron dogs joined by a short chain and used to couple logs end to end when skidding.
Guard	Protective device around a machine or danger zone.
Hazard	Condition in which risk is involved.
High Lead Block	The main line pulley for moving logs.
Holding Wood (hingewood)	Section of wood located between the undercut and the backcut which prevents the tree from prematurely slipping or twisting from the stump, and controls the direction of fall (Figures I-3 and I-4).
Jackstrawed	Logs stacked randomly or irregularly.
Kickback	Strong thrust of the saw back toward the cutter, generally resulting from improper use of the saw. Kickback also refers to a tree jumping back over the stump toward the cutter.
Knot	Branch cross-section that is embedded in a tree trunk or board.
Knot Bumping	Removing limbs with a chain saw or axe just prior to loading.

Landing (yard)	Area where logs are brought for subsequent loading and hauling.
Limb (branch)	To remove the limbs from a felled tree.
Lines	The wire ropes or cables used in logging.
Loader	Machine or person used to load logs onto a transport vehicle.
Lodged Tree	Tree that has not fallen to the ground after being partially or wholly separated from the stump or otherwise dislodged from its natural position.
Log	Tree segment suitable for subsequent processing into lumber, pulpwood, or other wood products.
Logger (lumberjack)	One engaged in the production of logs.
Matchcutting	Felling trees without making an undercut.
Peavy	A stout wooden lever used for rolling logs; the tip is fitted with a strong, sharp spike.
Picaroon	Device with a head similar to an axe, with a point rather than a blade, which is used to assist in the lifting and placement of bolts of wood.
Pulpwood	Wood cut or prepared primarily for use by a pulp mill. Also refers to pulp species such as hemlock, white fir, spruce.
Reynaud's Syndrome	Circulatory disorder of the extremities which can be caused by extended exposure to vibration.
Rigging	The lines, blocks, sheaves, etc used in cable systems of logging.
Root Protrusions	Lateral and vertical extensions of roots above ground.
Root Wad	Mass of roots and dirt which projects above the ground level after a tree has been pushed over.
Scaler	One who determines the volume of a log or load.
Skid (yard)	To pull or drag logs or trees from the stump to a landing.

Skidder (yarder)	Machine (either track laying or wheeled) or an animal, used to move logs or trees to a landing.
Skyline	The overhead supporting steel cable used for various types of logging.
Snag	Standing dead tree or portion thereof.
Spar Tree	Tree at the landing that is rigged and used for yarding logs. Also used for loading and swinging.
Springpole	Tree or branch that has been placed under tension.
Strawline	Small cable.
Strip	Defined area of timber allocated to a cutting crew.
Tail-hold	Anchor used for making fast a line.
Trip Tongs	Hooking device used to lift or skid logs.
Turn	Group of logs yarded or skidded at one time.
Undercut (face)	Wedge-shaped cutout or notch that controls the direction of fall of a tree (Figure I-2).
"V" Lead	In yarding, when the angle of the main line between the yarder, the bull block, and the turn of logs is less than 90 degrees.
Widowmaker	An overhanging loose limb or section of a tree which might become dislodged and fall on a logger working beneath it.
Wraps	Loops of line around a cylinder or tree.
Yard (landing)	Place where logs are accumulated.
Yarding (skidding)	The act of moving logs to the yard or landing.

Section 2 - Work Practices

The classes of logging hazards are abbreviated here as follows: falling and flying objects, FFO; rolling and moving logs, RML; chain saw

operations, CSO; slips, trips, and falls, STF; and moving equipment, MVE. They identify the hazard that the work practice prevents or helps to alleviate.

(a) General

(1) The employer shall instruct and supervise employees to ensure that the following work practices are complied with.

(2) The employer shall account for each employee at the end of each shift. During the workday, the buddy system or some other effective system shall be used to ensure accountability of each employee.

(b) Felling and Bucking (CSO, FFO, RML, STF)

(1) Chain Saws and Hand Tools

(A) Tools shall be used only for the purposes for which they were designed.

(B) Each tool shall be inspected and any deficiency corrected prior to use.

(C) The cutting edges of tools shall be kept sharp and properly shaped.

(D) Heads of hammers, wedges, and sharp tools shall be dressed or ground to a suitable radius when they become mushroomed or cracked.

(E) Hand-held files shall be equipped with a handle.

(F) Stored tools shall be shielded or otherwise protected to prevent injuries.

(G) Chain saws shall be inspected daily to ensure that handles and guards are in place, and controls and other moving parts are functional.

(H) The saw shall be adjusted to prevent the chain from moving when the engine is at idle.

(I) Unless the carburetor is being adjusted, the saw shall be turned off before any adjustments or repairs are made to the saw or to the chain.

(J) The saw handlebars shall be kept free of oil accumulations which could result in the loss of control of the saw.

(K) The chain saw engine shall be stopped before fuel or oil is added.

(L) The chain saw shall be fueled outdoors not less than 20 feet from persons smoking or from other potential sources of ignition.

(M) Chain saw reserve fuel shall be stored in an approved US Department of Labor, Occupational Safety and Health Standards, (1910.106) container. Metal containers and portable tanks meeting the requirements of and containing products authorized by Chapter I, Title 49 of the Code of Federal Regulations (regulations issued by the Hazardous Materials Regulations Board, Department of Transportation) also shall be acceptable.

(N) The power saw shall be moved at least 10 feet upwind from the fueling point and wiped free of spilled gasoline before it is started.

(O) Firm footing shall be ensured before the saw is started and operated.

(P) Chain saws shall be started on the ground or on a solid surface, ie, a log or stump. They shall be held firmly with the

bar tip clear of any obstruction.

(Q) A saw shall not be operated unless it is equipped with a muffler and spark arrester.

(R) The saw shall be controlled with both hands during operation.

(S) Saws shall be turned off when being carried over uneven ground, underbrush, or slippery surfaces.

(T) The saw shall not be carried on the shoulder unless the engine is stopped. Furthermore, the chain and dogs shall be adequately shielded unless the shoulder and neck are otherwise protected.

(2) Manual Felling Operations (CSO, FFO, STF)

(A) No work shall be started or continued when heavy fog precludes visibility of tree tops or during high winds, electrical storms, or other hazardous weather conditions.

(B) Employees shall be spaced and their duties organized so that the actions of one will not create hazards for others.

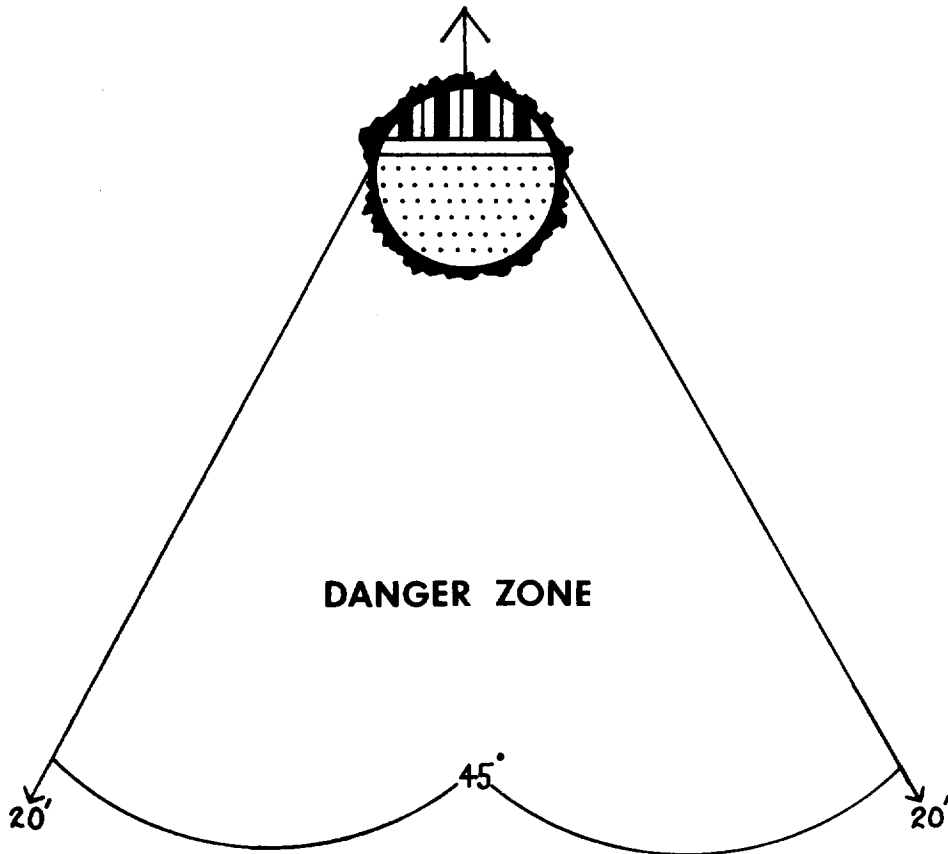
(C) Work areas shall be assigned so that a tree cannot fall into an adjacent occupied work area. The distance between work areas shall be at least twice the height of the trees being felled. A greater distance may be required on downhill slopes depending on the degree of the slope and on the type of tree and other considerations.

(D) Strips shall be worked in such a manner that hangups caused by felling into standing timber are avoided.

(E) Hazards shall be checked before cutting is started. This includes checking the tree to be felled for dead limbs, rot, and lean to determine felling direction. Adjacent trees shall be checked

for dead limbs and their potential for becoming springpoles. Precautions shall be exercised for each situation before any cut is started.

(F) An escape path to a safe location shall be determined and prepared before cutting each tree. This path shall extend from the base of the tree to the safe location at an angle away from the felling line (Figure I-1).



From Dent DD: Professional Timber Falling--A Procedural Approach.
Portland, Oreg, Ryder Printing Co, 1974, 182 pp

FIGURE I-1 ESCAPE PATH

(G) If the tree to be cut could possibly contact a powerline, the power company shall be notified immediately and all

personnel shall remain clear of the area until the power company representative advises it is safe to continue the operation.

(H) A cutter shall not be approached any closer than twice the height of trees being felled until a signal of approach has been acknowledged. An all-clear signal shall be given before cutting is resumed.

(I) Snags or trees which are unsafe to cut shall be removed by some other method.

(J) Snags that have loose bark in the area of the proposed cut shall have that bark removed before being felled.

(K) When a snag has elevated loose bark which cannot be removed, the buddy system shall be used to watch for and give warning of falling bark.

(L) To avoid use of wedges which might dislodge loose material, snags shall be felled in the direction of lean unless other means (mechanical) are used.

(M) Deteriorated or hazardous snags or trees shall be felled if they could endanger the cutting area, access area, landings, vehicular traffic, rigging, or rigging operations.

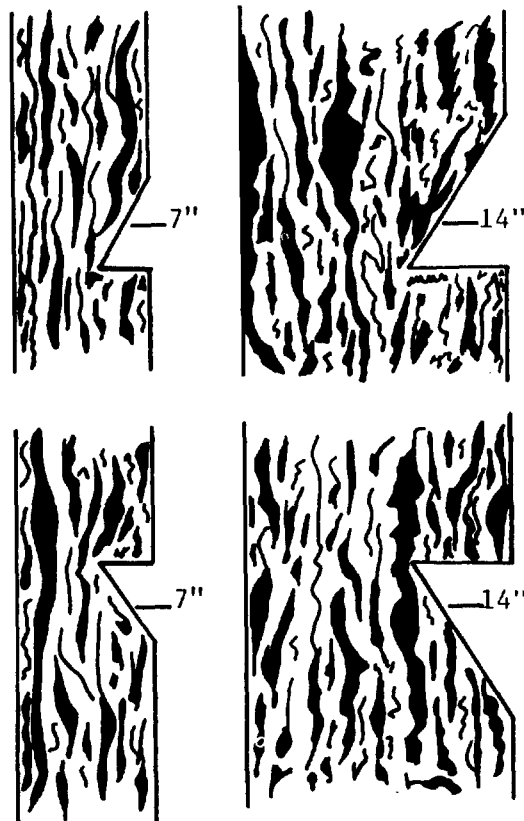
(N) Where felled trees are likely to roll and endanger workers, cutting shall proceed from the bottom toward the top of the slope, and performed uphill from previously felled timber.

(O) A warning shall be given to persons in the vicinity of a tree about to be felled and a determination made that such persons are out of reach of the tree and clear of logs, fallen trees, snags, or other trees which may be struck by the falling tree.

(P) As soon as the tree is committed to fall, the predetermined escape path shall be immediately followed to the safe area.

(Q) Undercuts shall be of a sufficient size to guide the tree in the intended direction of fall and to minimize the possibility of splitting (Figure I-2). Once the undercut is made, the felling process shall be continued to completion, unless the cutting area is kept free of unauthorized workers until the tree is felled.

(R) Undercuts shall be cleaned out to their full depth and width.



From Dent DD: Professional Timber Falling--A Procedural Approach. Portland, Oreg, Ryder Printing Co, 1974, 182 pp

Figure I-2 THE UNDERCUT

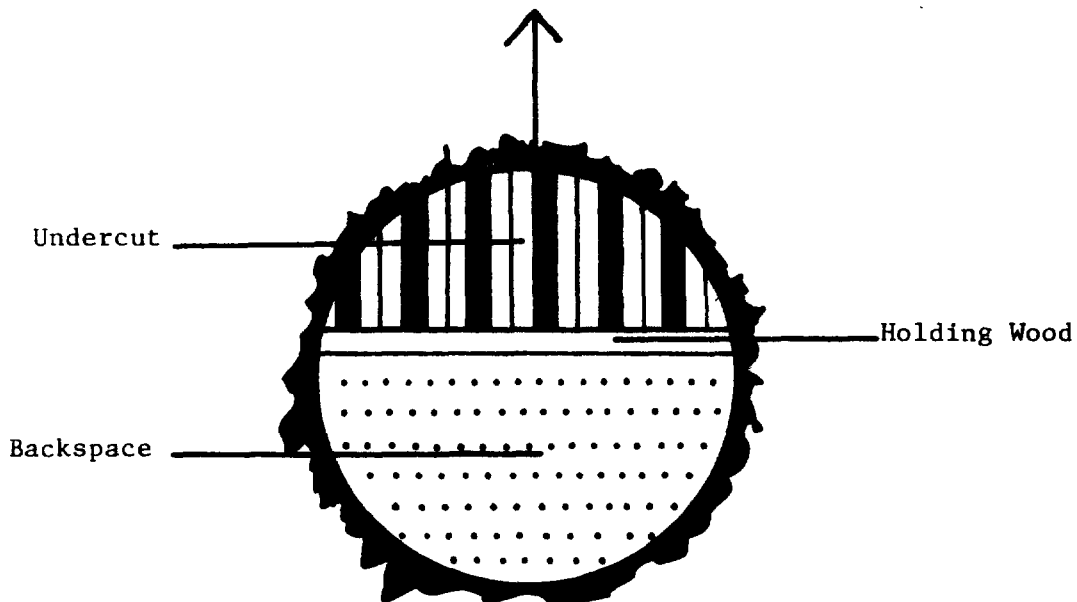
(S) The back cut shall be stopped at the point that allows holding wood to guide the tree or snag to prevent it from prematurely slipping or twisting from the stump (Figures I-3, I-4).

(T) The fall of a tree shall be controlled, if necessary, by inserting wedges, applying leverage in the back cut, or by using mechanical equipment.

(U) When a wedge is being used, the cutter shall watch for limbs or other material which might be jarred loose.

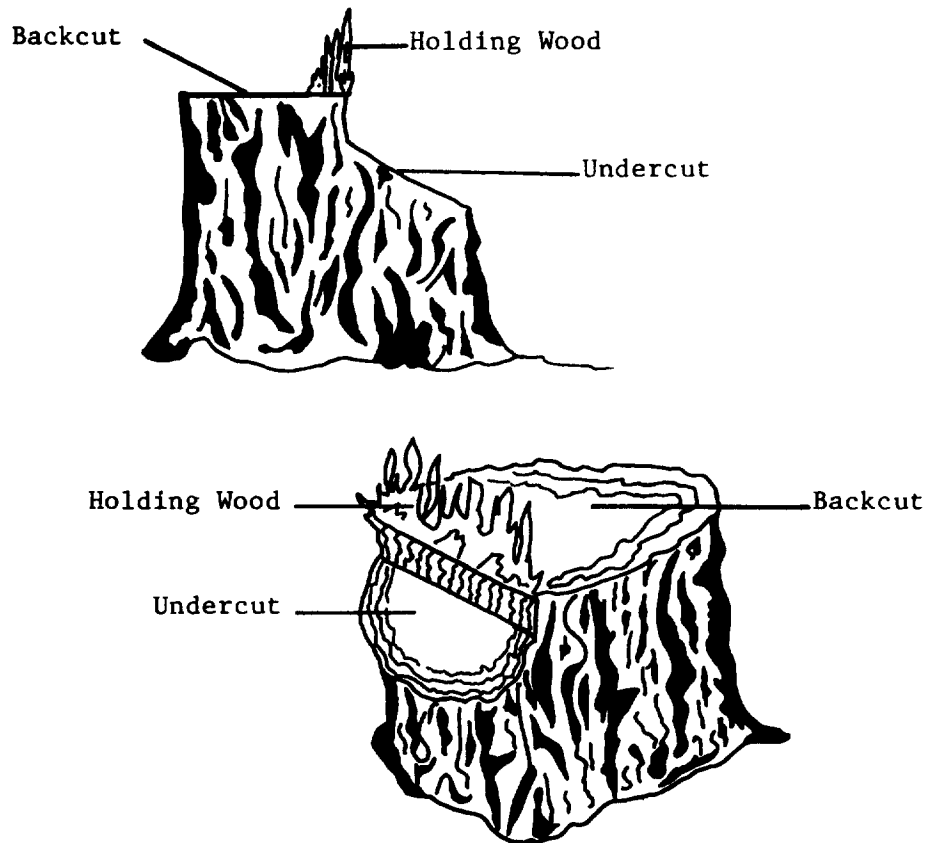
(V) Wedges shall be of soft metal, hardwood, or plastic.

(W) Cutting holding wood in lieu of using a wedge shall be prohibited.



From Dent DD: Professional Timber Falling--A Procedural Approach. Portland, Oreg, Ryder Printing Co, 1974, 182 pp

Figure I-3 HOLDING WOOD



From Dent DD: Professional Timber Falling--A Procedural Approach.
 Portland, Oreg, Ryder Printing Co, 1974, 182 pp

Figure I-4 BACKCUT, HOLDING WOOD AND UNDERCUT

(X) Lodged trees shall be clearly marked with red and white striped tape and all workers in the area shall be instructed not to pass or work within two tree lengths of such trees except to ground them.

(Y) Matchcutting should not be permitted and shall not be permitted for trees larger than 9 inches in diameter.

(3) When explosives are used, blasting operations shall be carried out in accordance with regulations in Title 29, Chapter XVII, Occupational Safety and Health Administration, Department of Labor, Occupational Safety and Health Regulations for Construction, Subpart H,

Sections 1910.109(e). (FFO,STF)

(4) Bucking Operations (CSO, FFO, RML, STF)

(A) Bucking shall not be conducted within two tree lengths or directly downhill of felling operations.

(B) Anyone within range of any log that might roll shall be warned before cutting starts.

(C) The tree (and root protrusion, if applicable) shall be carefully examined to determine which way the logs (and root protrusion) will roll, drop, or swing when the cut is completed. No worker shall be allowed in this so determined danger zone during cutting.

(D) The bucking location shall be cleared of hazardous obstructions before bucking begins.

(E) Bucking shall be performed uphill from previously bucked logs unless the log to be bucked is securely anchored or blocked to prevent rolling or swinging.

(F) Propping of logs or trees as a means of protecting workers downslope from the logs or trees shall be prohibited.

(G) Saw pinching and subsequent chain saw kickback shall be prevented by using wedges, levers, guidelines, and saw placement, or by undercutting.

(H) Logs shall not be jackstrawed when being bucked in piles or decks at a landing.

(I) Logs incompletely bucked shall be conspicuously marked with red and white striped tape and all workers in the area shall be notified of the location of the logs.

(c) Yarding (FFO, MVE, RML, STF)

(1) Skidder Maintenance and Repair (MVE, STF)

(A) Cracked or broken glass or other glazing material that obscures vision or constitutes a hazard shall be removed or replaced.

(B) Gasoline engines shall be stopped before being refueled.

(C) Smoking within 20 feet of the refueling operation shall be prohibited.

(D) When charging batteries, the vent caps shall be kept in place to avoid electrolyte spray. Care shall be taken to ensure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.

(E) Smoking shall be prohibited in the charging area.

(F) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

(G) Tools and other metallic objects shall be kept away from the tops of uncovered batteries.

(H) Before any work is performed on blades, arches, or other equipment, the equipment shall be blocked, lowered, or otherwise secured to prevent slipping or falling.

(I) Engines shall be stopped before being repaired.

(J) All braking systems shall be kept in good operational repair.

(K) Radiator coolant level shall be checked when the engine is cold. When the radiator cap must be removed from a hot radiator, the pressure shall first be released before the cap is removed.

(2) Skidder Operational Requirements (MVE)

(A) A skidder shall be operated only by an authorized operator.

(B) A skidder shall be operated only when the operator is in the position or location intended for such purpose.

(C) Seatbelts shall be worn when the skidder is equipped with rollover protective canopy.

(D) Riding on skidders is permitted only in seats designed for that purpose.

(E) The operator shall not start the skidder until all other persons are clear of both the machine and of all elements to be set in motion by the machine.

(F) When skidding equipment is operated near an electric powerline, a minimum clearance of 10 feet shall be maintained between the powerline and all elements of the equipment including items being transported.

(G) When the skidder operator dismounts with the engine running, the transmission shall be disengaged, the brakes set, and the blade lowered.

(H) Before the engine is shut down, the brake locks shall be applied and all elements such as blades, buckets, grapples and shears shall be lowered to the ground.

(3) Skidding Procedures (FFO, MVE, RML, STF)

(A) Before a skidder is started or moved, the operator shall be certain that nothing is in the way which could be set in motion by the movement of the machine thereby endangering personnel.

(B) A log or turn shall not be moved until all personnel are in the clear (and on the uphill side on sloping ground).

(C) Skidders shall not be operated within a radius of two tree heights of trees being felled unless called upon by the cutter to ground lodged trees. All cutters shall be notified of the skidder's entrance into the area and all felling within two tree lengths of the skidder shall be stopped.

(D) During use of a winch, the equipment shall be positioned so that the winch line is as closely aligned as possible with the long axis of the machine.

(E) Operators of mobile skidding equipment shall not use such equipment on unsafe slopes and under other conditions that exceed the safe operating limits of the equipment.

(F) Guiding lines onto drums with hands or feet shall be prohibited.

(4) Choker Setting (FFO, MVE, RML, STF)

(A) Care shall be taken to keep workers clear of rolling logs when chokers are being set or unhooked.

(B) Choker holes shall be dug from the uphill side of the log when there is danger of a log rolling.

(C) Chokers shall be placed near the end of the log or tree length, and at the log end nearer the yarder.

(5) Signals (FFO, MVE, RML)

(A) Signals shall be established and used; see Figure I-5 for examples.

(B) Signalling devices or communications systems shall be provided and maintained in working condition.

(C) Operators of engine-driven trucks and railroad cars shall be guided by signals from an observer with an unobstructed view of the operation. Vehicles shall not be moved until all workers are in the clear.

(D) Logs, loads, or rigging shall not be moved unless the signal received is clear and distinct. If there is any doubt about signal meaning, the signal shall be repeated as understood and a confirming signal awaited.




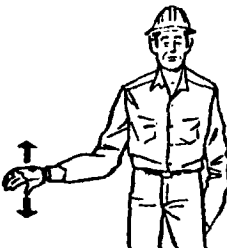





(E) Employers shall ensure that workers are familiar with all signals.

(F) Signals shall be given only by designated persons except in emergencies.

(G) Signalling by means of throwing objects in the air shall be prohibited.

(H) A signal such as a siren or extended blowing of a vehicle horn shall be used only to alert workers of exceptional hazards.

(I) When a grapple, balloon, or helicopter logging system is being used, radio shall be used to transmit instructions.

 <p>1. Place log on your side of load, or move log toward you.</p>	 <p>2. Place log on opposite side from where you are standing or move to side.</p>	 <p>3. Place log in center of load.</p>
 <p>4. Lower tong.</p>	 <p>5. Change ends with log when one tong is set.</p>	 <p>6. Roll log with tong swamped.</p>
 <p>7. Place blocking under log.</p>	 <p>8. Move truck toward me. Rotate hand in anti-clockwise movement in front of body. If at side of truck use same signal for ahead.</p>	 <p>9. Move truck from me. Rotate hand in clockwise movement in front of body. If at side of truck use same signal for backing.</p>

From Hand Signals for Logging Operations. State of Oregon, Workmen's Compensation Board, Accident Prevention Division, Labor and Industrial Building (not dated)

FIGURE I-5

EXAMPLES OF SKIDDER LOGGING VISUAL SIGNALS THAT MAY BE USED

(6) General (FFO, MVE, RML, STF)

(A) Equipment shall be inspected for malfunctions and defects. Those which affect its safe operation shall be reported to the supervisor and corrected before operations are started.

(B) Workers shall not be permitted to get on or off moving equipment.

(C) Lines shall not be hooked, adjusted, or crossed while the line is in motion.

(D) Wire rope (cable) shall not be knotted except on strawline hook attachments and temporary repair for archline hooks.

(E) Logs shall not be landed at the loading area if there is danger of incoming logs or rigging striking or fouling the loading rigging.

(F) Log piles and decks shall be located and constructed to provide working areas around them that will accommodate the safe movement of men and machinery.

(G) Logs shall not be landed until workers and equipment are in the clear.

(H) Workers removing logs from or placing them in decks shall be within sight or sound of the operator or of a signalman.

(I) When yarding is conducted during the hours of darkness, the area shall be illuminated to a 20 foot-candles minimum. The source of illumination shall be located and directed so as to create a minimum of shadows and glare. If a portable-type tail-hold is used, lights shall be directed on the equipment to allow the workman to ascertain visually that the tail-hold equipment remains stabilized.

(J) Landings shall be sized to provide safe working space for both workers and machines, and shall be kept clear of hazardous obstructions, rubbish, and other slipping and stumbling hazards.

(7) Cable Operations--except Skidder Operations (FFO, RML, STF)

(A) Workers shall be directed to get clear of logs, root wads, or rigging before the go-ahead signal is given and to stay clear until movement has stopped.

(B) The bight of any moving line under stress shall not be entered except when natural barriers provide protection.

(C) The anchor stump area and the bight of lines shall be evacuated as the guyline or wraps are being tightened.

(D) Chokers shall not be hooked or unhooked until rigging is stopped completely.

(E) Swinging and yarding with a "V" lead is prohibited on tree-rigged systems. The angle between the machine, the high lead block, and the yarding or swing road on tree-rigged systems shall not be less than 90 degrees (commonly referred to as a square lead).

(F) Skyline hooks, slings, lines, cables, skids, logs, or rigging shall not be ridden by personnel except in a carrier designed specifically for that purpose.

(G) Personnel may be transported on skyline logging machinery in safely designed carriers only after the carrier has made a complete traverse of the skyline.

(H) When transporting personnel, lines shall not be moved faster than 300 feet per minute.

(I) Chokers shall not be used on the grapple system when the yarder operator cannot clearly see the workers setting the choker.

(d) Loading (MVE, RML, STF)

(1) Area Maintenance--When a shovel or swing-type loading machine is engaged in handling logs and there are workers immediately nearby, a minimum of 36 inches clearance shall be maintained between the counterweight of the loading machine and such things as trees, logs, banks, backslopes, and trucks. If this clearance cannot be maintained, the hazardous area shall be isolated, using barriers or similar means.

(2) Signals (MVE, RML)

(A) Signals shall be established and used; see Figure I-6 for examples.

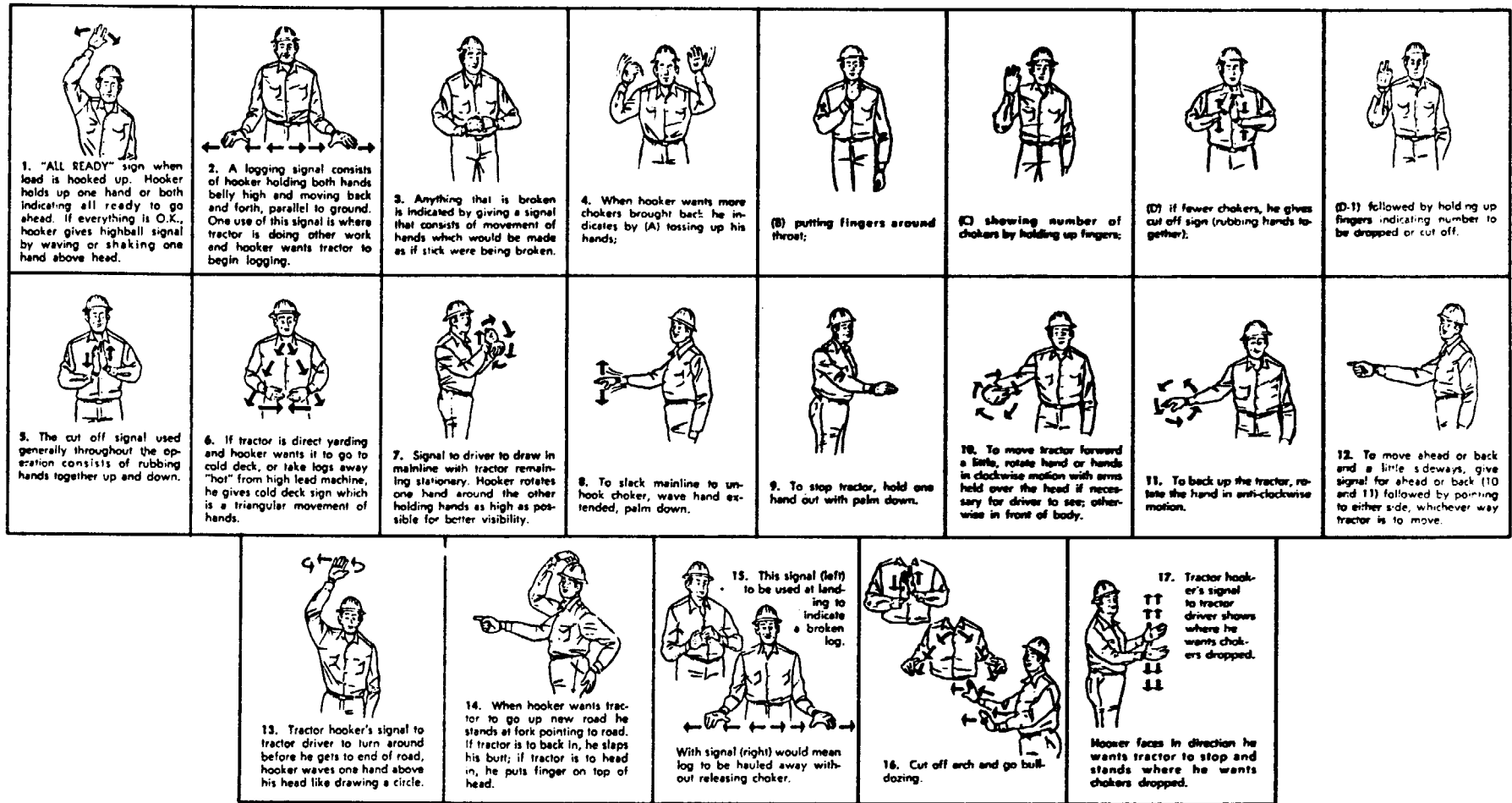
(B) To control the movement of a log truck being loaded, when the truck is to be moved, a positive means of communication shall be established between the truck driver/loader and/or the loading operator.

(3) Truck Loading Requirements (MVE, RML)

(A) The loader operator shall not be distracted while he is operating the controls.

(B) The transport vehicle shall be positioned so that a safe working clearance is provided between it and the pile or stack of forest products (logs, etc).

(C) When logs are being loaded, the load shall be built up in a manner to be stable without the use of binders. Binders shall be considered only as precautionary measures to ensure stability of the load.



From Hand Signals for Logging Operations. State of Oregon, Workmen's Compensation Board. Accident Prevention Division. Labor and Industrial Building (not dated)

FIGURE I-6 EXAMPLES OF LOADING SIGNALS

(D) In pyramidal loading, the centers of the upper logs shall be inside the centers of the outside log on the tier below.

(E) To prevent tilting, logs shall be loaded so that no more than one-third of the log's weight extends beyond the supporting logs below.

(F) Sufficient brow log blocking, or the equivalent shall be utilized to prevent logs from rolling out of control.

(G) Not more than the upper half of any log shall extend above the stakes unless the log is properly and securely saddled.

(H) Logs shall be loaded in an uncrowded manner to prevent excessive strain on the bunk stakes, binders, or bunk chains.

(I) Binders shall be placed and tightened around the completed load before it is balance-shifted. Binders shall be placed and secured before a truck is moved from the landing or loading area.

(J) Binders shall remain on the load until safeguards have been provided to prevent logs from rolling off the side of the truck when the binders are released. When binders are being adjusted, only one binder shall be loosened at a time.

(K) Binders shall be so placed that they must be released from the unloading machine side. Exception may be made at dumps where the unloader is equipped with tongs, grapples, or other mechanical devices that are capable of restraining the entire load.

(L) Trailers loaded on trucks shall be secured.

(M) When unloading trailers from motor trucks, the trailer shall be hoisted clear, the truck driven a safe distance, and the trailer lowered to within 1 foot of the roadway before workers approach the

trailer or reach (coupling pole) for positioning.

(4) Worker Location (MVE, RML, STF)

(A) Only the driver shall be permitted in the truck cab while logs are being loaded.

(B) All workers shall be in the clear while logs are being hoisted or while logs or loads are being shifted on trucks.

(C) Only the machine operator and necessary personnel shall be permitted in the work area.

(D) No one shall be permitted alongside or underneath trucks being loaded until communication has been established with the loading machine operator and assurance has been received that it is safe.

(E) The loading operator shall be notified and his acknowledgement ensured of anyone's intention to release bunk locks, place or remove compensating pins, scale logs, read scales, or make connections.

(F) Loads being raised or lowered shall not pass over any person or an occupied truck cab. No one shall be permitted to pass or stand under a suspended load.

(5) Procedures and Operations (CSO, FFO, MVE, RML, STF)

(A) Tongs shall be carried with the points so directed that, in case of a fall, they will not injure the worker.

(B) If an unobstructed view of all personnel and of vehicles being loaded cannot be maintained, communications shall be established to maintain awareness of worker location.

(C) When grapples, trip tongs, or similar devices are used, the log holding device shall be lowered to the ground whenever

the machine is unattended, ie, when the operator is out of sight or more than 25 feet from the machine.

(D) Hoisting or transport equipment shall not be left unattended with the power on or with the load suspended.

(E) Cross-haul hooks shall be maintained in a condition that will ensure secure holds.

(F) Loading hooks and tongs shall be securely attached on the loading line with screw shackles or equivalent devices.

(G) The use of a plain spiked loading hook without a bell is prohibited. Loading hooks shall be kept in good repair. Hand rope shall be attached to loading hooks.

(H) Where there is danger of tongs or hooks pulling out of the log, straps shall be used. Tongs may be used on extra-large logs, provided the logs are barked and notched to provide a secure hold.

(I) Peavies, cant hooks, picaroons, or slings shall be used to roll logs.

(J) Knot bumping shall be done before a log is loaded or after it is safely positioned on a load.

Section 3 - Training (Informing Employees of Hazards)

The employer shall ensure that employees have sufficient proficiency to safely perform their intended tasks before allowing them to participate in logging operations without immediate supervision. The employer or his representative shall train employees in the work practices contained in Section 1, and explain the associated hazards of the job. A training program shall be developed and implemented. (Chapter V contains suggested training guidelines.)

Section 4 - Medical

(a) All employers shall ensure that their employees are physically fit to carry out their assigned jobs safely. This shall be accomplished either by a medical examination made available to each new employee before placement or through a current medical report provided by the employee. Biennial examinations shall be provided for employees under 40 years of age, and annual exams for employees 40 years of age and older. This shall be a general medical examination to identify aggravated, previously existing conditions and any new condition that would endanger the worker's safety. It shall include examination of the cardiovascular, musculoskeletal and central nervous systems, and emphasize the integrity of the extremities and digits, of hearing and visual acuity, and for chain saw operators, an examination of peripheral vasculature (Reynaud's syndrome). All employees shall be given a copy of their medical report upon termination of employment to take to his or her next employer.

(b) The ability of employees to safely perform their assigned tasks shall be medically determined upon return to work after an absence for illness or injury of 5 or more days.

(c) A complete series of tetanus toxoid inoculations shall be made available to each new employee. Booster doses shall be made available at least every 10 years to maintain active immunity, unless an injury requiring a booster intervenes.

(d) First Aid Provisions

(1) A minimum of two people trained in first aid shall be available at each worksite to render emergency aid. First aid supplies approved by a consulting physician, eg, the US Forest Service first aid kit, shall be available at each worksite.

(2) Snake bite kits shall be available at each worksite wherever there is a possibility of a bite by a venomous species.

(3) A vehicle capable of being used for the evacuation of injured employees shall be located in the vicinity of the worksite during logging activities.

(4) Employers shall ensure that employees are aware of the location of all first aid equipment, the evacuation vehicle, and how to obtain emergency assistance and medical attention.

Section 5 - Posting

(a) Warning signs shall be prominently displayed on access roads to a logging area. Signs shall be removed when logging is completed.

(b) Warning signs and any instructions shall be printed in English. They shall also be printed in the language of non-English-speaking workers, if any, unless these workers are otherwise informed. All illiterate workers shall be given special instruction.

(c) Snags and logs that are partially bucked shall be conspicuously marked with red and white striped tape.

(d) Telephone numbers for ambulance service, first aid, hospital emergency service, and fire and rescue squads shall be posted near the logging operation, for example in the vehicle specified in Section 4(d)(3), and at the communication center.

Section 6 - Personal Protective Equipment

(a) General Requirements

(1) The employer shall be responsible for ensuring adequacy, maintenance, and sanitation of all personal protective equipment.

(2) The employer or his representative shall instruct employees on the use of personal protective equipment.

(3) Equipment guards such as chain brakes, chain guards, or throttle controls shall not be tampered with or removed.

(b) Selection and Use

(1) Employees shall wear eye and face protection in accordance with 29 CFR 1910.133.

(2) Employee exposure to air contaminants shall be limited in accordance with 29 CFR 1910.93, and respiratory protection shall be in accordance with 29 CFR 1910.134.

(3) The employer will comply with requirements of 29 CFR 1910.95 for noise exposure.

(4) When operating a chain saw, employees shall wear leg protection (chaps, pads, inserts) made from ballistic nylon or its equivalent.

(5) Depending on the requirements of the terrain and the timber, employees shall wear safety boots, safety shoes, or calked boots (excluding low-cut shoes). Safety-toe footwear shall be constructed in accordance with 29 CFR 1910.136.

(6) In areas where there are potential drowning hazards, employees shall wear flotation devices in accordance with 29 CFR 1918.106 and shall work within sight or sound of another person.

(7) When operating chain saws, filing sharp tools, or handling any kind of rope or cable, employees shall wear appropriate hand protection such as leather gloves.

(8) Employees shall wear head protection in accordance with 29 CFR 1910.135.