



**State of Alaska
Occupational Safety and Health**

Additional Logging Standards

Adopted by Reference Under
8 AAC 61.1060



**ALASKA DEPARTMENT OF LABOR
& WORKFORCE DEVELOPMENT**

Good, Safe Jobs Are Alaska's Future

FIELD OFFICES

1111 W. Eighth Street, Suite 304
P.O. Box 111149
Juneau, AK 99811-1149

3301 Eagle Street, Suite 305
Anchorage, AK 99503

675 7th Avenue, Station J1
Fairbanks, AK 99701

2030 Sea Level Drive
Ketchikan, AK 99901

The standards prescribed in this subchapter were published on July 31, 1995. Alaska safety codes and standards apply to all places of employment. Information relative to the safety codes will be furnished by the above offices.

ALASKA DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

Section 18.60.010 of the Alaska Statutes designates the Alaska Department of Labor and Workforce Development as the agency responsible for developing and administering an occupational safety and health program for the State of Alaska. To carry out this responsibility AS 18.60.055 established the Division of Labor Standards and Safety.

The division is charged with the responsibility and has the authority to:

- Enforcement all laws and lawful orders requiring work and work places to be safe and healthful;

- Investigate disabling or fatal occupational injuries and illnesses;

- Inspect work places to determine if conditions are safe and healthful;

- Develop occupational safety and health standards which, after adoption, have the effect of law; and

- Establish special orders, or rules and regulations to cover a specific place of employment or process of work.

A variance from an occupational safety and health standard adopted by the department may be granted by the Commissioner of Labor as provided by AS 18.60.077, AS 18.60.081, and regulations promulgated pursuant thereto.

Editor's Note: These safety and health standards are adopted by reference under 8 AAC 61.1060 of the Alaska Administrative Code and were published on July 31, 1995.

Reprinted July 2008

8 AAC 61.1060 Additional Logging Standards

Table of Contents

<u>Section</u>	<u>Subject</u>	<u>Page</u>
(a)	Definitions and Terms	1
(b)	General Safety and Health Provisions	9
(c)	Medical and First Aid	9
(d)	Personal Protective Clothing and Equipment	10
(e)	Danger Trees	10
(f)	Falling and Bucking	10
(g)	Snags and Saplings	11
(h)	Falling	11
(i)	Danger Areas and Signals	11
(j)	Bucking	11
(k)	Communications	12
(l)	Signals	12
(m)	Rigging	17
(n)	Yarding, Swinging, and Loading	36
(o)	Truck Logging	39
(p)	Log Dumps, Booms and Rafts	42
(q)	Helicopter Logging	45

8 AAC 61.1060 ADDITIONAL LOGGING STANDARDS.

(a) Definitions and terms applicable to this article.

- (1) "Bight" means a loop of rope, the ends made fast elsewhere, or the angle formed by a line running through a block.
- (2) "Binder" means either chain, cable, or rope used for binding loads of logs or lumber or the tool used for that purpose.
- (3) "Block" means a pulley used in power logging to change the direction of haul or to increase the pulling power.
- (4) "Board foot" means a unit of measure represented by a board one foot long, one foot wide, and one inch thick. Abbreviation: FBM, Ft. B.M., Bd. Ft. In finished or surfaced lumber, the board foot measure is based on nominal size. The working unit is 1,000 board feet. Abbreviation: M.Bd.Ft., M.B.M.M.B.F.
- (5) "Boom" means the logs or timbers fastened together end to end and used to hold floating logs. The term also includes the logs enclosed. The projecting arm of a log loading machine which supports the logs during loading is called the "loading boom". This projecting arm may be either the swinging or rigid type.
- (6) "Brow log" means a log placed parallel to any roadway at a landing or dump to protect vehicles while loading or unloading.
- (7) "Buck" means to saw felled trees into shorter cuts.
- (8) "Bucker" means the person who saws logs into desired lengths.
- (9) "Bug" means device used to close an electrical circuit to initiate a signal to an operator.
- (10) "Bullbuck" means the supervisor over the cutting crew.
- (11) "Bunk" means the cross support for logs on a logging car or truck.
- (12) "Butt hook" means the hook at the end of the haul-in-line for attaching choker to line.

(13) "Butt rigging" means a combination of swivels, shackles, chain or straps and butt hooks that permits connection between main and haulback line with swivels to prevent kinking or tangling.

(14) "Cat's Paw" means a type of knot identical to a sheet bend, bucket bend or weaver's knot.

(15) "Chaser" means the member of the yarding crew who unhooks the logs at the landing or frees hang-ups on skid road.

(16) "Choker" means a wire rope or chain with special attachments put around logs near the end, for hauling or lifting.

(17) "Chokerman" means the employee on rigging crew who handles chokers.

(18) "Cold deck" means any pile of logs which is yarded and left for future removal.

(19) "Commissioner" means Commissioner of Department of Labor and Workforce Development, State of Alaska.

(20) "Crotch line" means two short lines attached to hoisting line by means of a ring or shackle, the lower ends being attached to loading hooks, or to a spreader bar.

(21) "Crummy" means a vehicle used in logging camps for transportation of supplies and personnel.

(22) "D or strap socket" means a socket with a closed loop and arranged to be attached to the end of a line.

(23) "Dead man" means a buried log or other object used as an anchor.

(24) "Fair lead" means sheaves or rollers set transversely or vertically in a unit in front of another pair of sheaves to guide a rope coming from any direction and leading it properly to a drum.

(25) "Grade (see "slope")" means the slope of a surface such as a roadway. Also, the elevation of a real or planned surface or structure.

(26) "Gut wrapper" means intermediate binder for an individual tier of logs.

(27) "Guy lines" means the ropes used to stay or support spar trees, booms, etc.

- (28) "Gypsy drum" means an empty drum where wraps of a line are taken and held or pulled by hand, or slipped as need be.
- (29) "High climber" means a person who tops and rigs spar trees or poles.
- (30) "High lead" means a modification of groundlead logging wherein the main lead block is placed on a spar tree, generally 100 to 125 feet above the ground, to give a lifting effect to the incoming logs.
- (31) "Hooktender" means one who supervises the method of moving logs from the woods to the place of loading.
- (32) "Hot deck" means a landing where logs are constantly being moved.
- (33) "Landing" means any place where logs are laid after being yarded to avert loading.
- (34) "Lang lay rope" means a wire rope in which the wires in the strands and the strands in the rope are laid in the same direction.
- (35) "Leaner" means a live or dead leaning tree.
- (36) "Main line" means a line used in the high-lead system or, in moving cable systems of logging, the cable used to haul in the logs, or any trunk line of a road system or railroad, or a major route of commerce.
- (37) "Molle (Molly Hogan)" means a piece of wire strand or rope used as a temporary means of tying, hitching, holding or fastening together the spliced loop ends of two pieces of rope; or a piece of wire strand used in place of a cotter pin in a shackle pin, etc. (also known as a strand laid grommet).
- (38) "Operation" (show) (woods layout) means any place where logging is being done.
- (39) "Pass line" means a small line threaded through a block at the top of a spar tree to assist the bight climber.
- (40) "Portable spar or tower" means an engineered structure designed to be used in a manner similar to which a wooden spar tree is used.
- (41) "Provide" means to have available.

- (42) "Qualified" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- (43) "Reach" means the rod or beam connecting a semi-trailer to a motorized logging vehicle.
- (44) "Rigging" means the cable, block and hook equipment used in cable systems of logging and all appurtenances similar thereto.
- (45) "Rigging slinger" means one who directly supervises chokermen.
- (46) "Roadline" means the path the rigging assumes from the spar tree to the tailhold.
- (47) "Rolled eyes" means rolling two halves of the line back on each other to form eyes also known as "Flemish eyes" or "farmer's eyes".
- (48) "Running line" means any moving rope as distinguished from a stationary rope such as a guyline.
- (49) "Safety factor" means the ratio of breaking load to safe load.
- (50) "Scaler" means one who calculates the footage of logs.
- (51) "School marm" means a tree that forks.
- (52) "Settings" means the area logged by one spar tree. Also the temporary station of a portable sawmill, yarding engine, or other machine used in logging. The ground within the yarding distance of a spar tree.
- (53) "Show" (see operation).
- (54) "Side" means the unit of logging operation, including employees and equipment, that is sufficient to fall, buck and load a given show ready for the transportation of logs to a mill.
- (55) "Skidding" means moving logs on a surface of ground to the place where they are to be loaded (see "Yarding"). It may be accomplished by stationary machine, a moving vehicle, or animal.

(56) "Skyline" means the cable suspended between the head spar tree and the tail tree or tail hold in cable-way logging on which the skyline travels; synonymous with aerial line, track cable and track line.

(57) "Skyline carriage" means the carrier which travels along the skyline or track cable in skyline systems; sometimes called a bicycle.

(58) "Skyline systems" means cable hauling systems characterized by a skyline or track cable upon which a traveling carriage or trolley travels between the head spar tree and the tail tree. May be one of two principal systems; tight skyline system, in which the skyline remains stationary or slack skyline system in which the skyline may be lowered to pick up the logs.

(59) "Slack line" means a type of skyline, the end of which can be let out or taken in.

(60) "Slash" means branches, bark, tops, chunks, cull logs, uprooted stumps, and broken or uprooted trees left on the ground after logging; also a large accumulation of debris after wind or fire.

(61) "Snag" means a dead standing tree or portion thereof which remains standing.

(62) "Snubbing" means a method of retarding or controlling that movement of logs or machine by means of looping the rope around a stationary object.

(63) "Spar trees" means a tree from which the top and limbs have been cut and used to support the blocks and ropes for various systems of logging.

(64) "Spring board" means a board shod with iron at the heel and used by fallers to stand on when they must work about ground level.

(65) "Strap" means any short piece of line used for securing or holding together equipment or parts of equipment or for loading, also known as a sling.

(66) "Straw line" means a small donkey line used for miscellaneous purposes.

(67) "Strip" means a definite allocated location of timber on which a cutting crew works.

(68) "Swamping" means the falling of brush around or along a specified place.

(69) "Tail hold" means any anchor used for making fast a line.

(70) "Tail tree" means the tree at the opposite end from the head tree on which the high line rigging is hung.

(71) "Tight line" means the process in which power is exerted on both mainline and haulback at the same time.

(72) "Topping" means cutting off the top section from a tree preparatory to rigging the tree for a spar.

(73) "Tree shoe" means a saddle with a solid curved grooved seat between side plates lashed to a tree as a support for lines.

(74) "Turn" means a single or group of logs being yarded as a unit.

(75) "Undercut" means a notch cut in the tree to guide the tree in falling.

(76) "Windfall" means a tree felled by the wind or other natural cause.

(77) "Yarding" means skidding logs to landing; the operation of collecting logs to one central loading or shipping point.

(b) General Safety and Health Provisions

(1) Each employer shall assure safe removal of hazardous trees and snags within falling distance of buildings, roads, landings, donkeys, and rigging prior to commencing operations.

(2) Each employer shall institute a system for employees assigned to work alone in remote or isolated areas to report to someone periodically by radio or telephone or designate a person to check on a lone employee's safety at reasonable intervals. All persons involved in working alone shall be advised of the reporting procedures to be followed.

(3) Each employer shall assign a minimum crew of two persons to work on potentially dangerous operations such as cutting, yarding and loading operations and they shall remain in visual or voice contact with one another. Vehicle operators, watchmen, and other specific assignments of recognized singular type are exempt from the minimum crew requirements of two persons.

(c) Medical and First Aid

(1) A stretcher, two wool blankets and splints shall be readily available (within ¼ mile) to any one point of operation.

- (2) Radio communication must be available within ½ mile of logging and road construction working crews.
- (d) Personal Protective Clothing and Equipment must meet the requirements of 29 C.F.R. 1910.266(d)(1). In addition, the following requirements must be complied with:
 - (1) Employees working on landings, or log sorting areas must wear a high-visibility vest or a fluorescent colored hard hat;
 - (2) Employees working on logging or road construction operations may not use radios, cassette players, or other sound equipment that is not work related;
 - (3) Where employees are required to work on wet or slippery logs, they must wear sharp caulked boots; and
 - (4) Suitable eye protection must be worn by all employees who are banding loads of logs.
- (e) Danger Trees
 - (1) Stump heights must be that height which, in the judgment of the cutter, will allow maximum safety during the falling operation.
 - (2) Wherever possible, danger trees must be felled in the direction of lean, using as deep an undercut as possible to avoid vibration from using wedges.
- (f) Falling and Bucking
 - (1) Trees must not be felled or bucked within a unit of standing timber before cutting operations if the falling or bucking creates a hazardous condition for the original or subsequent cutters or operations. If such hazardous conditions arise, precautions must be taken before starting regular operations to minimize the hazard. If, for any reason, the cutter believes a tree cannot be safely felled, bucked and left in a safe and stable position, the tree must not be felled.
 - (2) Employees in charge of falling and bucking shall be experienced in that kind of work. They shall survey the area for possible hazards and proceed according to safe practices in placing crews and supervising work.
 - (3) Employees in charge of falling and bucking shall regularly inspect the work of the cutting crews and shall be responsible for seeing that the work is performed in a proper and safe manner.

(4) Fallers and buckers shall confer with their supervisor regarding a safe manner of performing the work and in unusually hazardous situations shall not proceed with the work until their method has been approved by their supervisor.

(5) When practical, strips shall be laid out so that fallers face out into openings when starting strip and all timber shall be felled into the open whenever conditions permit.

(6) Fallers should not fall into another strip; leaners on the line should be traded.

(7) All members of the cutting crew, and anyone visiting the cutting area, must carry a whistle for use in emergencies.

(g) Snags and Saplings. Small saplings near a landing which may reach any employee if pulled over shall be felled or pulled over before operations begin.

(h) Falling

(1) Unless certain conditions (i.e., tree leaning in the wrong direction) dictate otherwise, the back or felling cut must be parallel to the inner edge of the undercut and must be approximately two inches higher than the undercut, except when using the swing cut.

(2) A way of escape must be planned before felling a tree, and must be kept free of brush, tools, or other obstructions. The route of escape must be clear of the intended direction of the falling tree. Workers must keep at a safe distance from the base of the tree as it is falling.

(i) Danger Areas and Signals. Anyone approaching an area where trees are being felled or bucked shall make his presence known and shall not proceed into the danger area until clearance is given by a member of the crew.

(j) Bucking

(1) The bucker shall carefully examine the tree before making a cut to determine which way the logs will roll, drop or swing when the cut is completed. The safe position found shall be used in finishing the cut.

(2) If it is dangerous to cut a log clear through, a safe margin of wood may be left uncut. In this case, each log shall be distinctly marked at both ends with a chopped "XX" to warn rigging crew and others. The bullbuck or scaler shall be notified.

(k) Communications. Every cutting crew shall be provided with radio communication and immediate transportation shall be available for emergencies.

(l) Signals

(1) The employer shall adopt the standard system of signals, set out in paragraph (4) of this subsection, for each operation. A copy of the standard hand and whistle signals shall be posted at places where crews congregate. For tractor logging operations, hand signals shall be posted at places frequented by the crew members such as in crew buses, etc. The employer shall require that the standard signal system be understood and used by all employees.

(A) All signals shall be made clear and distinct.

(B) At no time (except in an emergency) shall an operator acknowledge any other than customary or prearranged signals.

(C) All persons shall be in the clear before a signal is given to move a load or rigging.

(D) Regular signals from any one place shall be given by only one designated person. In case of danger, however, anyone may give a "stop" signal.

(i) Operators of equipment shall not move logs, loads, or rigging until all employees are in the clear and a signal has been given. Operators shall be alert for signals at all times.

(ii) Hand signals shall be used only when in plain sight of and within 300 feet of the operator. In an emergency, hand signals may be used any time as a stop signal.

(E) Throwing back, chips or other material as a signal is strictly prohibited.

(F) The use of jerk wire signal system for any type of yarding operation is prohibited.

(G) When chasers or rigging crews are out of sight of or more than 300 feet from the operator, a designated person shall be in charge of the signal device at all times.

(H) Signal systems shall be properly installed and adjusted and shall be maintained in good operating condition at all times.

(I) A loud whistle, horn or other signal, which can be clearly heard by the rigging crew, shall be installed on all donkeys or tractors operating as yarders or swings. Wires and other connections used in operating these signals shall be secure, maintained in good condition and protected against accidental signaling.

(J) "Bugs" shall be so designed that they cannot be accidentally tripped.

(2) Voice communication may be used for yarding under the following conditions:

(A) Voice communication by use of radio frequencies may be used to transmit instruction and directions to the yarder operator when using a grapple or jammer type logging system providing no person is in a hazardous area near live rigging.

(B) Voice communications may be used to instruct the yarder operator when picking up an occasional log with the use of a choker on a grapple system providing the grapple is on the ground prior to the setting of the choker and that no lines are moved by the operator until the person setting the choker has returned to a safe location away from any running lines. At no time shall chokers be used on the grapple system during the hours of darkness or during periods when visibility is reduced to such an extent that the yarder operator cannot clearly see the employee setting the chokers. When a number of logs are required to be yarded by using chokers instead of the grapple, the requirements specified for high lead type of logging shall apply.

(C) Voice communications by use of radio frequencies may be used to transmit instructions and directions to the yarder operator when using a balloon system for yarding. The person operating the radio shall ascertain that all crew members are in the clear before transmitting instructions which would cause any line or turn to move. The person giving such instructions shall keep the crew members informed as to which movements will commence.

(D) Voice communications on the same radio frequency used to transmit high lead, slackline or skidder whistle signals shall be limited to reporting injury, fire or other emergencies. Federal communications Commission requires that assigned call letters be used in conjunction with voice communications.

(3) Non-Standard Signals. If a standard signal is not listed for an unusual or new situation, a hand or whistle signal, other than any listed for the type of yarding being done, may be used. Any special signals so developed shall be understood by all persons required to work in the area which may be affected by their use.

(4) The following signals shall be considered standard. All signals shall be visible or audible.

(A) AUDIBLE SIGNALS, GENERAL

SIGNAL	MESSAGE
1 long – 1 short	Start or stop work
3 medium	Hooktender
3 medium – 4 short	Hooktender and his crew
7 long	Man injured, call transportation and stretcher
5 long	Climber

(B) AUDIBLE SIGNALS FOR HIGH LEAD
/ means longer spacing between signals

SIGNAL	MESSAGE
1 short	Stop all lines
3 short – 3 short	Ahead slow on mainline
3 short	Ahead on mainline
2 short	Ahead on haulback
2 short – 2 short	Ahead slow on haulback
3 short - 1 short	Ahead on strawline
3 short – 1 short - 3 short	Ahead slow on strawline
4 short or more	Slack mainline
2 short – 1 short	Slack haulback
3 short – 1 short - 4 short	Slack strawline
1 short – 2 short	Standing tight line
1 short – 1 short	Tight line while lines are running, or break if running tight
3 short	When rigging is in: strawline back on haulback
3 short/plus "X" number	When rigging is in: indicate number of shorts sections of strawline back on rigging
3 short – 1 short – 2 short	Strawline back on rigging
4 short	When rigging is in: chaser inspect and repair

	rigging
2 short	When rigging is in: no chokers back
2 short – 1 short/plus "X" number of shorts	Number of chokers back
2 short – 4 short	When rigging is in: slack haulback-hold all lines until 2 short blow
GRABINSKI SYSTEM	
2 short – 1 short	Slack mainline and haulback
2 long	Take off or put on rider block

(C) AUDIBLE SIGNALS WHEN BUTT RIGGING IS AT THE TREE
/ means longer spacing between signals

SIGNAL	MESSAGE
1 short	Chaser inspect and repair rigging
2 short	No choker
2 short – 1 short	One choker
2 short – 2 short	Two chokers
2 short – 4 short	Stack haulback and hold all lines until 2 short are blown
3 short – 1 short	Strawline back on haulback

(D) AUDIBLE SIGNALS FOR SKIDDERS
/ means longer spacing between signals

SIGNAL	MESSAGE
1 short	Stop moving carriage – Stops or goes ahead on slack puller as case may be, if carriage is stopped
2 short	Go ahead on skidding line holding carriage
1 short – 2 short	Pick up skidding line, easy
2 short – 1 short	Shake up carriage to clear choker
2 short – 2 short	Ahead on receding line
3 short	Ahead on carriage, holding at present
3 short – 3 short	Ahead easy on skidding line
2 short – 2 short – 2 short	Slack skyline, cable down
2 short – 2 short	Pick up skyline, cable up
2 short – 1 short	
2 short – 2 short – 4 short	Slack receding line
2 short – 2 short – 1 short	Tighten all lines
1 short – 4 short	Slack off slack puller

2 short – 2 short/ plus "X" number of shorts	When carriage is in: number of chokers wanted
2 short – 2 short 1 long – 1 short	Bull choker
1 short	When carriage is in: inspect butt rigging
2 short – 4 short – 1 short	For each additional ten feet of tong line
1 long/plus "X" number of shorts	Number of coils of strawline wanted
5 medium	Tail or second rigger
5 medium – 4 short	Tail or second rigger and his crew
SIGNAL	MESSAGE
2 medium	Skidder hear rigger
3 medium – 4 short	Hooker and his crew
2 long	Ahead on transfer
1 long/plus "X" number of shorts	Number of coils of strawline wanted
5 medium	Tail or second rigger
5 medium – 4 short	Tail or second rigger and his crew
2 medium	Skidder hear rigger
3 medium – 4 short	Hooker and his crew
2 long	Ahead on transfer
1 long/plus "X" number of shorts	When carriage is in: number of coils
2 short – 2 short 1 short/plus "X" number of shorts	When carriage is in: number of chokers
1 short	When carriage is in: inspect rigging, repair, and send back
2 short – 2 short – 4 short	When carriage is in: stack, haulback and hold all lines until 1 short is blown then send back
3 short – 3 short	When carriage is in: send back powder
5 medium	Tail rigger
5 medium – 4 short	Tail rigger and his crew
2 long – 4 short	Slack transfer
1 short – 3 short	Ahead on carriage with slack puller line
1 long	Ahead on strawline
1 long – 4 short	Slack strawline
1 long – 3 short	Ahead easy on strawline

(E) AUDIBLE SIGNALS FOR SLACKLINES
/ means longer spacing between signals

SIGNAL	MESSAGE
2 short – 2 short 2 short – 1 short	First cable up when road has been changed and tail hold made fast.

2 short – 2 short – 2 short	Drop skyline
1 short	Stop any moving line
1 long	When logging, stack skyline
2 short	Ahead on skyline
1 long – 2 short	Ahead easy on skyline
3 short	Ahead on skidding line, holding haulback
3 short – 3 short	Ahead easy on skidding line with slack haulback
SIGNAL	MESSAGE
4 short	Slack skidding line
2 short – 2 short / 2 short – 2 short	Ahead easy on haulback with slack skidding line
2 short – 2 short	Ahead on haulback
2 short – 2 short – 4 short	Slack haulback
2 short/3 short	Pick up skyline and skid
2 short/2 short – 2 short	Pick up skyline and skin
3 short - 1 short	When carriage is in: strawline back on haulback
3 short – 2 short	Tight line
3 short – 1 short – 4 short	Slack strawline
3 short – 1 short – 3 short	Pull easy on strawline
2 long	Ahead on transfer
2 long – 4 short	Slack transfer
2 long – 2 short – 2 short	When carriage is in: transfer back on carriage

(5) No tree may be felled within range of a road until all necessary precautions such as use of a flagman, signs, or barricades have been taken to assure safe traffic.

(m) Rigging (1) General

(A) Rigging and all parts thereof shall be of a design and application to safely withstand all expected or potential loading to which it will be subjected. In no case shall the allowable loading or stress imposed exceed one-half of the ultimate or breaking strength of any parts of the rigging. This paragraph shall not apply to chokers.

(B) The placing and condition of rigging shall be such as to insure safety to those who will be working in the vicinity. Reefing or similar practices to increase line pull is prohibited. Lines shall not be moved when

any employee is in the bight. Running lines shall be arranged so employees will not be required to work in the bight.

(C) While a road line is being changed, all employees shall be in the clear before lines are tightened.

(D) A thorough inspection of all blocks, straps, guylines and other rigging shall be made by a supervisor before they are used. This inspection shall include an examination for damaged, cracked or worn parts, loose nuts and bolts, and of lubrication and the condition of straps and guylines. Required repairs or replacement for safe operation shall be made before the rigging is used.

(E) Fair leads shall be securely fastened and properly aligned at all times and shall be of a design that will prevent excessive line damage.

(F) Employees may not ride hooks, lines or any other rigging except where such equipment is provided with handholds, footholds or other necessary means for riding safely and where lifting of employees by such devices will eliminate a greater hazard.

(G) When working in the vicinity of standing saplings that are likely to siwash a running line, the rigging crew shall move away from the sapling a distance of one and one-half times the height of the sapling before the lines are tensioned.

(H) Employees in the vicinity of an area where logs are being yarded must watch the turn and rigging, remain on their feet, and may not turn their backs to the turn until it is well into the clear.

(2) Portable Metal Spars (A) Definitions

(i) "Vertical portable metal spar" as used in this subsection means that the spar is designed to operate in a vertical position. This does not mean that the spar cannot be operated while inclined, if so designed by the manufacturer and is held within the limitations recommended by the manufacturer.

(ii) "Leaning type portable metal spar" as used in this article means that the spar is designed to operate in an inclined position as recommended by the manufacturer.

(B) Design and Construction

(i) Portable metal spars and their appurtenances shall be designed, constructed, and maintained in accordance with established principles of mechanics and sound engineering practice. They shall be of sufficient strength to support the estimated or actual dead loads without the resulting stress exceeding 70 percent of the tensile yield point of the material being used in their construction. In addition to these loads, due allowances shall be made for loads from wind, impact, erection, and any special loadings that may occur, and no combination of these loadings shall cause a stress in any member that exceeds 70 percent of the tensile yield point of the material of that member. In determining the size and design of the members of portable metal spars and their appurtenances, the tensile yield point shall be determined by referring to standards for materials and design as developed by nationally recognized authorities.

(ii) Fittings to accommodate not less than three evenly spaced back guys and one nose (snap) guy shall be provided on all leaning type portable metal spars.

(iii) All lines, blocks, and fairleads shall be located so that there will be no chafing or sawing of any line or part of the structure.

(C) Identification and Capacity Markings

(i) Each portable metal spar shall have identification and specification plates permanently attached to its base in a position that can be easily read by a person standing on the ground or on the base platform. Plates shall contain the following information:

- a. name of the manufacturer, city and state where manufactured;
- b. the model number;
- c. the maximum size of mainline and haulback line for which the spar is designed;
- d. the number and size of guylines and any other lines required;

- e. if the spar is designed for a skyline, slackline or modified slackline system, the maximum size of skyline, mainline and haulback line that can be used; and
- f. the maximum and minimum inclination at which the spar is designed to be operated.

(D) Erecting, Lowering, and Moving

- (i) All persons not engaged in the actual raising or lowering of portable metal spars shall stay in the clear during these operations.
- (ii) The manufacturer's complete written instructions covering the proper method of raising, lowering and tightening of guylines shall be permanently attached to each portable metal spar.
- (iii) A qualified person shall direct each raising and lowering of each portable metal spar.
- (iv) Where guylines are required in raising and lowering, great care shall be used to prevent fouling of or excess tension in the line.
- (v) Portable metal spars shall be leveled as necessary to provide proper line spooling and avoid excessive stress on component parts.
- (vi) A stable base shall be provided under outriggers or leveling pads in soft ground.
- (vii) During movement of the portable metal spar, the spar shall be lowered or adequately supported so that the stability of the machine is not impaired.

(E) Guying of Spars

- (i) Vertical portable metal spars 55 feet or more in height from base or trunnion must be guyed with not less than six guylines. The total of the opposing guylines must provide strength substantially equal to that of the mainline used. All skyline operations using vertical metal spars where full log suspension is required or where full log suspension can occur must have a minimum of 3 guylines in quadrant 3.

(ii) Vertical portable metal spars less than 55 feet in height from base or trunnion, when used with mainline smaller than one and one-eighth inches in diameter, shall be guyed in one of the following ways:

- a. with not less than six guylines, each of which shall provide strength substantially equal to that of the mainline used;
- b. with not less than five guylines, each of which shall be equal in strength to line one-eighth inch larger in size than the mainline used; or
- c. with not less than four guylines, each of which shall be equal in strength to line one-fourth inch larger in size than the mainline used.

Guylines shall be arranged in such manner that stresses will be imposed on not less than two guylines. When used with mainlines one and one-eighth inches in diameter or over, spars less than 55 feet in height shall be guyed as required in clause (i) of this subparagraph.

(iii) Leaning type portable metal spars 55 feet or more in length from base or trunnion shall be guyed with not less than three back guys, each of which shall be at least equal in strength to that of the mainline used. Guys shall be arranged in such manner that strains will be imposed on not less than two back guylines. In addition, one nose (snap) guy of equal strength to the mainline, or a means providing equivalent stability, shall be used.

(iv) Leaning type portable metal spars less than 55 feet in length from base or trunnion, when used with mainline smaller than one and one-eighth inch diameter, shall be guyed with not less than two back guys, each of which shall be of strength at least equal to line one-fourth inch larger than the mainline used. Back guys shall be arranged to form an angle between 70 and 90 degrees with each other and opposite the direction of stress. In addition, one nose (snap) guy of the same size used for the back guys, or a means of providing equivalent stability, shall be used. When used with mainlines one and one-eighth inch diameter or over, such spars shall be guyed as required in clause (iii) of this subparagraph.

(v) Boom type machines used for yarding which are specifically designed to be self-stabilizing may be used without guying. When the stability of the machine is impaired in any manner, the machine shall be guyed as required by clauses (iii) and (iv) of this subparagraph.

(vi) Any additional guying recommended by the spar manufacturer shall be used.

(vii) Guylines shall be anchored as required in paragraph (13) of this subsection except that guylines may be choked around adequately notched stumps when shackles or approved choker attachments are used. When cable clamps are used two full wraps or more must be placed around an adequately notched stump and secured with not less than three cable clamps.

(viii) A safety strap or equivalent device shall be installed at the top of the spar to prevent guylines from falling in case of structural or mechanical failure of the guyline attachment. Such device shall develop strength at least equivalent to the guyline strength.

(F) Use

(i) A "V" lead is defined as an angle of the mainline between its drum on the logging machine, the fairlead and the yarding or swing road which is less than 90 degrees. Swinging or yarding with a "V" lead is prohibited, except under the following conditions:

- a. the number of logs to be yarded or swung is so few as to make re-positioning of the logging machine impractical;
- b. no hazards to the logging machine operator, or to other workmen in the area, will be created because of this operating procedure;
- c. the spar shall be equipped with fairleads for both main and haulback lines;
- d. the mainline and haulback drums shall be located not more than 25 feet from the base of the spar;
- e. not less than six guylines shall be used; and

f. each guyline on the side opposite the direction of stresses imposed by yarding or swinging shall have a breaking strength at least 20 percent greater than that of the mainline used; or one extra guyline at least equal in strength to the yardline used shall be placed to oppose the stress imposed by yarding or swinging in a "V" lead; and when the lead is changed, the required extra guyline shall be repositioned to oppose the stresses due to this changed direction of pull.

(These requirements for additional strength guylines or an extra guyline do not apply to those spars where the mainline and haulback drums are located within the base of the spar, or where lines from these drums are lead through sheaves located within the base of the spar.)

NOTE: For purposes of determining guyline requirements only, this method of leading main and haulback lines is not considered as creating a "V" lead.

g. Yarding or swinging in a "Y" lead shall not be performed at less than an angle of $67\frac{1}{2}$ degrees formed between the logging machine, fairlead and the yarding or swing road on either side of the spar, unless the machine controls and operator are located in a safe position beyond possible contact by chokers, lines, rigging, or logs.

(G) Inspection, Repair and Maintenance

(i) Portable metal spars and their appurtenances shall be inspected by a qualified person each time the spar is lowered and at any time its safe condition is in doubt. When damage from overstress is noted or suspected, the part in question shall be inspected by a suitable method and found to be safe, or the part repaired or replaced before the spar is again used. All lines, including guylines, shall be inspected and any wire rope worn or damaged beyond the point of safety shall be repaired or replaced.

(ii) No person shall go up a raised spar unless suitable pass line equipment is provided.

(iii) Only persons skilled in the type of work involved shall make repairs or replacements on the load-bearing portions of portable metal spars. Such work shall be done in such a manner that the original design strength of the spar is not impaired.

(iv) All mobile vehicles on which yarding equipment, towers, masts or booms are installed shall be maintained in a safe operating condition.

(H) Load bearing guyline angles for all supports must not exceed 50 degrees measured from the horizontal. If suitable anchors are unavailable or the terrain is so steep that the guyline angle exceeds 50 degrees, an additional guyline must be rigged to oppose the load.

(I) Guylines for wood head spars, gin poles, "leaning type" and portable metal spars must be positioned according to manufacturer's recommendations.

(J) If guylines cannot be rigged according to manufacturer's recommendations because of the slope of the terrain or because suitable anchors are not available in the necessary locations, additional guylines must be rigged to oppose the load.

(K) Load bearing guylines must, to the extent possible, be of equal length and pretensions.

(3) Climbers

(A) The high-climber shall be an experienced logger with knowledge of logging methods and the safety of rigging and spar trees.

(B) High-climbers shall be equipped with a safety belt, steel spurs, and a steel-cored hemp climbing rope or chain which shall be kept in good condition. An extra set of climbing equipment and a person with some climbing ability shall be available to assist in case of an emergency. Tools used by the climber shall be securely fastened to his belt.

(C) Climbers shall not top trees during extreme adverse weather conditions.

(D) When the climber is required to top trees ahead of operations, another employee shall be assigned to stay within sight of him at all times.

(E) While the climber is working in the tree, employees shall keep a safe distance from the tree. The climber shall give warning in case a shackle, pin, hook, bark or any other material is in danger of dropping or is to be deliberately dropped.

(F) An experienced employee stationed out of danger of falling objects shall be assigned to transmit the climber's signals and shall not be otherwise occupied while the climber is in the tree. The machine operator shall not be otherwise occupied while the climber is using the pass line.

(G) When the climber is using a pass line, the pass line shall be evenly spooled onto the drum at all times by an experienced employee.

(i) When the friction lever and pass line drum are on the opposite side of the machine from the engineer, an experienced person shall operate the friction lever while the engineer operates the throttle.

(ii) The use of a Gypsy drum for handling employees in the tree is prohibited.

(iii) Splices and knots in the passline are prohibited.

(iv) The pass line shall be long enough so that there will be at least three wraps on the drum before the climber leaves the ground.

(v) A climber shall ride only the pass line.

(vi) The running lines shall not be moved while the climber is working the trees except such "pulls" as he directs.

(H) No work shall continue on the tail tree while the climber is working on the head tree or vice versa, if the trees are connected by any line.

(I) Topping, rigging-up or stripping work shall not be done when visibility is impaired.

(4) Equipment

(A) Standard equipment shall be classed according to the manufacturer's rating. Where low gear ratios or other devices are installed to increase the power of the equipment, the size of the riggings shall be increased so that it will safely withstand the increased strains.

(B) The amount of rated drum pull which a machine can deliver on a load shall be the determining factor in rigging-up.

(5) Cables and Fastenings

(A) All cables used shall be certified as to their break strength by the manufacturer in accordance with the U.S. Bureau of Standards specifications or other acceptable authority.

(B) Cables or straps which are badly worn, crystallized or kinked shall not be used. Stranded, chafed or sawed lines or straps shall be replaced or repaired upon discovery. Cables worn or damaged beyond the point of safe use shall not be used.

(C) Use of wire rope that has been burned (by improper use of a torch, etc.) is prohibited.

(6) Lines, Blocks and Shackles

(A) All lines, straps, blocks, shackles, etc., shall be in good condition and shall be of sufficient size, strength and material to withstand at least one and one-half times the stress imposed by the maximum pull of the tower unit. All wire rope or other rigging equipment which shows a 30 percent reduction in strength below this requirement shall be replaced.

(B) When used or second-hand cables are acquired, they shall not be used for any running line, skyline, slackline or for any purpose until inspection determines that they will meet all the requirements of subparagraph (A) of this paragraph.

(C) All line eye splices shall be tucked no less than three full tucks. D's and knobs are recommended for ends where applicable.

(D) In joining two lines, they shall be connected only by a long splice except that shackles or patent links of the next larger size than the line may be used where practicable. Routine use of "Molly Hogan's" on running lines is prohibited except for joining strawline sections. Short splices are permitted only in strawlines.

(E) The splicing of two lines together for loading or pass lines is prohibited.

(F) At no time, except where authorized, shall any employee drive a metallic object into a commercial saw or pulp log. If emergency work exists, the metal shall be removed immediately when the splice or other work is done. A stump shall be used whenever possible for splicing.

- (G) All tree straps shall be one-quarter inch larger than the pulling line. If impossible to use a safety strap, all tree straps shall be one-half inch larger than the pulling strap.
- (H) All straps, other than tree straps, shall have strength at least equal to the strength of the lines and/or the rigging they support.
- (I) All tree jacks shall be hung by wrapping the strap once around the tree and hanging the jack in two eyes.
- (J) A safe margin of line shall be used for making long splices.
- (K) All blocks shall be of steel construction and hung so that they will not strike or interfere with other blocks or rigging.
- (L) All blocks shall be properly secured by pins and wire strands or keys. When hung in trees, all pins shall be threaded with nuts and keys or wire strands. The spread in the jaws of the shackles shall not exceed by more than one-fourth inch the size of the yoke or swivel of the block to which it is connected.
- (M) All shackles shall be made of forged steel one size larger than the line it connects. Galvanized shackles are prohibited.
- (N) Wire rope for strawline or pass line shall not be less than three-eighths of an inch in diameter.
- (O) The upbuilding by welding of high lead shackles, skyline, shackles, tower skidder shackles, swivels and other equipment which is subjected to heavy stress is prohibited.
- (P) Splices, other than eye splices in "Lang Lay" loading lines, are prohibited.
- (Q) Eyes in "Lang Lay" lines shall be tucked four times. Marine splices shall not be used in running lines.
- (R) Short splices, eye to eye splices, cat's paws, knots, molles or rolled eyes are prohibited except for temporary purposes. They shall not be used where they are subjected to strain. Arch line knots are permitted when they are properly tied and the line end is fused.

(S) When heel tackle is fastened near a machine, the safety line shall be placed in such a manner that, in case of breakage, lines will not strike the power unit and endanger the operator.

(T) Where a "Dutchman" is used either for yarding or on a skyline, a block of heavy construction shall be used. A regular tree shoe or jack may be used for a "Dutchman" on a skyline. The cable shall be fastened securely.

(7) Cable Clips and Clamps

(A) Cable clips or clamps may be used only in locations where they are readily accessible for frequent inspections. Clips or clamps, when used, shall be properly applied and allowance shall be made for the reduced strength of the line.

(B) Cable clips or clamps for joining lines shall only be used for transferring slack lines from one place to another. They shall not be used where lines are subjected to any working strain.

(C) U-bolt type clips properly attached and in conformity with the number and spacing as given in Table 7-1 will be considered as developing 80% of the rated rope strength.

TABLE 7-1

Diameter of Rope	No. of Clips Required	Space between Clips
1 1/2"	8	9"
1 3/8"	7	8 1/4"
1 1/4"	7	7 1/2"
1 1/8"	6	6 3/4"
1"	6	6"
7/8"	5	5 1/4"
3/4"	5	4 1/2"
3/8 to 5/8"	4	3"

(D) Clips shall be spaced at least six rope diameters apart to obtain the maximum holding power and shall always be attached with the base or saddle of the clip against the longer or "live" end of the rope. Nuts shall be tightened evenly and tightened again after application of the first sustained load. After the rope has been used and is under tension, the clips shall be tightened again to take up any looseness caused by the

tension reducing the rope diameter. Even when properly applied, a clip fastening has only about 80% of the strength of the rope.

(8) Shackles

(A) All shackles used for joining lines shall have a strength at least equal to one and one-half times that of the lines they join.

(B) Shackles used to hang blocks or jacks shall have a strength at least equal to two times that of the pulling lines.

(C) Wire strands used to secure pins shall be run twice through the pin and the loose ends shall be rolled in.

(D) Shackle pins and nuts shall be replaced when worn or when the threads are worn or stripped.

(E) Clevises or shackles used for all other connections shall be of the screw-pin or lock-nut type.

(F) Shackles, swivels, links and rigging plates shall be replaced or repaired when they are worn and will not safely support the imposed strain.

(G) The spread of the jaws of a high lead shackle shall fit the yoke or the swivel.

(9) Blocks

(A) Blocks shall not be used for heavier strains or larger lines than those for which they are constructed.

(B) Blocks, sheaves and all parts thereof shall have a designated strength capable of withstanding a force at least equal to 1 ½ times the breaking strength of the line for which they are designed.

(C) Sheaves shall be of mild steel or better material. Bearings shall be of a material and type that will safely withstand the speeds and strains imposed and shall be kept well lubricated.

(D) Use of sheaves having badly corrugated cable grooves or having grooves which do not fit the lines running on them is prohibited.

- (E) All blocks shall be fitted with line guards to prevent fouling.
- (F) The bar and yoke pins of all blocks shall be securely fastened.
- (G) All running line lead blocks shall be hung in both eyes of the straps. The use of threaded straps for running line lead blocks is prohibited.
- (H) Tail, side blocks or any other blocks used in yarding or swinging shall be properly and securely hung in the straps. These straps shall be of line at least equal in strength to the running lines.
- (I) The yoke-pins of the haulback blocks must be inserted with the head facing in the direction from which the butt rigging approaches.
- (J) Mainlines on high lead systems shall not be run through a fair lead or a block serving as a fair lead, but shall run directly from the drum to the main lead block.
- (K) Pass blocks shall be inspected before being placed in each tree and necessary replacements or repairs made before being hung.
- (L) The shells of the pass blocks shall be bolted under the sheaves and properly guarded to prevent the pass chain ring from entering the block.
- (M) The bearing pin shall be securely locked and nuts shall be keyed or the block shall be of the type which positively secures the nut and pin.
- (N) Sheaves shall be not less than the standard six inch diameter.
- (O) Pass blocks shall not be used for any other purpose.
- (P) Pass block straps shall be not less than one-fourth inch larger than the pass line.
- (Q) At least two blocks, a corner and a tail block must be used on all logging systems to distribute stress unless a person specifically authorized by the employer has determined that one block is adequate. Exemption: When utilizing a grapple yarding system, one block is sufficient.

(10) Straps

- (A) All tree straps shall be of a size to render a strength at least equal to twice that of the pulling lines they support. (Straps one-fourth inch

larger than a pulling line will be assumed to be in reasonable compliance with that requirement when hung in both eyes.)

(B) All tree straps shall be of new wire rope when made up. They shall be replaced when there is evidence of damage or broken wire.

(C) The use of properly socketed "D's" instead of eyes for attachments on tree straps is recommended.

(D) All straps, other than tree straps, shall be at least as strong as the line they hold. Where it is permissible to hang a block in a single eye, the strap shall not be less than the strength of the running line. The cable used for the straps, other than tree straps, shall have at least 80 percent of the original breaking strength and shall not be used if any of the wires break in splicing.

(11) Safety Straps

(A) Safety straps shall be used on all mainline and skyline lead blocks.

(B) Safety straps shall be of at least one inch material with one end securely fastened to the block and the other to a shackle, with the closed end of the shackle up, arranged to slide on a guyline. The pin of this shackle shall be securely held in place by a cotterkey or molle and placed in the eye of the strap. Safety straps shall be attached to the guyline which will carry the block in the direction of the least hazard to employees and which extends as near as possible at right angles with the power unit. This guyline is usually the guyline nearest the logging lead. Any guyline which is used for this purpose shall not have an extension shackle within 100 feet of the spar tree.

(C) In rare cases where a safety strap would carry a block or line to a place where employees normally work, a safety strap shall not be used but the block strap shall be one-half inch larger than the pulling line, and the block shall not be of the swivel type.

(12) Skylines

(A) Skylines shall be hung in a tree jack and securely anchored to a stump, dead man or other satisfactory anchor. The end of the skyline shall not be anchored to a spar tree. In rocky country, it is sometimes necessary to use steel pins drilled into the rock as skyline anchors.

(B) Skylines shall be anchored with not less than three and one-half wraps, well spiked or by choking the stump and using a largeshackle over the skyline with the pin through the eye. Skylines anchored to dead men shall be passed through a block and properly clipped (clamped).

(C) Extensions to skylines shall be at least equal in strength to the lines to which they are attached. Extensions shall be attached only by a regular long splice or a shackle connecting two spliced eyes tucked not less than three times. If connected by a shackle, the shackle shall have not less than one and one-half times the strength of the lines.

(D) When the tail hold on a skyline is choked on a stump, there shall be no bight against the shackle.

(13) Guylines

(A) Guylines must be of plow steel or better material in good condition.

(B) Guylines sufficient n number, condition and location to develop stability and strength equivalent to the ultimate or breaking strength of any component part of the rigging or equipment must be provided.

(C) Guyline requirements for spar trees, and portable metal spars used for both loading and yarding or both loading and swinging, must be less than six top guylines and four buckle guylines. Guyline circles must be cut out except in the following locations:

(i) In areas of old growth and second growth partial cuts.

(ii) In areas where the only suitable landing location would require cutting timber that is needed for resource protection.

(D) When guyline circles are not cut out under subparagraph (C) of this paragraph, the following requirements must be met:

(i) All danger trees within guyline circle must be cut;

(ii) All trees that interfere with the proper alignment, placement, or tightening of the guylines must be felled; and

(iii) Guyline stumps must be inspected daily before start-up.

(E) When any portable type tower, A-frame or spar is used, the base must be securely and solidly supported.

(F) In certain partial cut or thinning operations, the following rules may be substituted for the general rules of this subsection if an acceptable degree of safety is provided:

(i) In overstory removal using a mainline, skyline, slackline or running (Grabinski) skyline, the rigging requirements of this section must be followed;

(ii) When lateral skidding or side blocking with skyline yarding systems is conducted, the tail tree must be guyed with no less than two properly located back guylines, which must be substantially equal in strength to the ultimate or breaking strength of any load carrying line, and one snap guyline; and

(iii) The running (Grabinski) skyline system must not be anchored directly to the tail tree. No less than one additional block must be rigged behind the tree. Guylines, as described in this subsection are required notwithstanding the load line size.

(G) Guylines must be fastened by means of shackles or hooks and slides at least equal in strength to the guylines. Shackle pins must be securely fastened with molles, cotterkeys or the equivalent. Only sleeve shackles must be used on guylines on which a jack is hung.

(H) The "U" part of the shackle must be around the guyline and its pin passed through the eye. Guylines must be hung in a manner to prevent fouling when they are tightened.

(I) The use of loops or molles for extending guylines is prohibited.

(J) Extensions to guylines must be at least equal in strength to the lines to which they are attached only by a regular long splice or a shackle connecting two spliced eyes or equivalent. If connected by a shackle the shackle must be not less than one and one-half times the strength of the guyline.

(K) All guyline eyes must be tucked no less than three times.

(L) Stumps used for fastening guylines and skylines must be carefully chosen as to position, height and strength. They must be tied back if

necessary. Standing trees must not be used for this purpose except for yarding tail holds. These stumps or trees must be inspected from time to time while the operation is in process.

- (i) Stumps must be adequately notched and barked where the wraps are to be made. Employees shall stand behind the stump in the clear as the guyline or the wraps are being tightened. Guylines must be anchored to stumps with no less than two and one-half wraps, with no less than six staples or eight railroad spikes driven solidly into sound wood on the first and last wraps. Guylines, when anchored to dead men, must be run through a block and properly fastened with clips (clamps), unless they are tightened from the other end, in which case the eye shall be shackled to the deadman strap. Rock bolts and other types of imbedded anchors may be used if properly installed.

(M) In removing guylines or skylines from stumps, a reversed safety wrap must be put on before loosening any spikes in the last wrap.

- (i) An experienced person shall be in charge of loosening guylines or skylines using all proper precautions and giving warnings before lines are released.

- (ii) Safety holdbacks must be used when necessary for the safety of workers.

- (iii) Powder or power is recommended for releasing the last wrap on skylines.

(N) Crawler tractors that are stabilized without guylines may be used for anchoring guylines or skylines under the following conditions:

- (i) Guyline or skyline angle must not exceed forty degrees as measured from the horizontal.

- (ii) The tractor being used for the anchor must not be on a slope greater than 20% in the direction of the pull.

- (iii) The tractor must be equipped with a blade. The blade must be dug in so that at least one-half the depth of the blade is below natural ground or two feet, whichever is greater or some alternative method which will provide equivalent protection must be provided to ensure the stability of the machine.

(iv) The guyline or skyline must be attached to the machine at the drawbar drum or both trunnions and must pass over the dozer blade. The edges of the dozer blade or other sharp edges that would chafe or cut the line must be smooth or provisions made to control chafing or cutting.

(v) The following table must be used to size equipment anchors:

Guyline or Skyline	
Equipment Weight	Size in inches
30,000 lbs or D6 Class	Up to and including 7/8"
40,000 lbs or D7 Class	Up to and including 1"
65,000 lbs or D8 Class	Up to and including 1 3/8"

(O) Crawler tractors that are used as mobile tail anchors and are stabilized with guylines must be guyed in accordance with (2)(H) and (I) of this subsection.

(14) Pass Lines, Chains

(A) The pass line shall be in good condition with no short splices, knots, molles or eye to eye splices and shall be long enough to allow the end of the line to reach the drum of the machine before the climber leaves the ground. When coupled to a drumline by use of a hook or molle, the pass line shall be long enough to provide three wraps on the drum before the climber leaves the ground.

(B) Drums used for pass lines shall at all times have sufficient flange depth to prevent the pass line from running off the drum.

(C) All spar trees shall be equipped with pass lines. Pass lines shall not be over one-half inch in diameter.

(D) Pass chains shall be at least 3/8" chain of alloy steel and shall not contain cold shuts or wire strands. Pass chains shall be attached to the end of the pass line with a ring large enough to prevent the ring from going through the pass block.

(E) The pass line equipment shall not be used for any purpose other than that for which it is intended. The pass line shall not be subjected to

any sawing on other lines or rigging and it shall be kept in the clear of all moving lines and rigging.

(15) Butt-rigging. Use of molles or cold shuts in butt-rigging is prohibited. All swivels shall be operative.

(n) Yarding, Swinging, and Loading

(1) General

(A) Ends of lines attached to drums shall be securely fastened.

(B) Ends of lines over one inch in diameter shall be babbitted and securely clamped or fastened by means furnishing equivalent strength.

(C) Not less than two wraps of line shall be maintained on drums at all times.

(D) A tool-handle stick, ironbar or similar object shall be used in guiding lines onto the drums. Guiding lines with the hands is prohibited.

(E) Employees shall be positioned in a safe location, such as above or behind the turn, where they will not be exposed to the hazards of moving logs, root wads, chunks, or rigging before the "go ahead" signal is given and they shall remain in a safe location at all times while the rigging is moving.

(F) Employees shall not stand in the bight of any moving line except when natural barriers will give them adequate protection.

(G) When pulling in the lines, employees shall not stand close to fair leads or blocks.

(H) The chaser shall assure that the log is properly landed before approaching it to remove the choker.

(I) Logs shall not be landed while the loaders or chasers are engaged in hooking on.

(J) Logs shall not be removed from the yarder tree by swing while the chaser is unhooking the turn from the yarder.

(K) Care shall be taken in working around logs which are propped or show a tendency to roll. Persons in charge shall carefully watch for such hazards.

(L) Employees shall watch for rolling or sliding logs, "widow-makers," and falling snags when approaching hang-ups.

(M) Standing on or near logs which may be moved or pulled by the logs being skidded is prohibited.

(N) Yarding with more than one power unit on any one spar tree is prohibited.

(O) The angle between the power unit, the high lead block and the mainline road shall not exceed a square lead on rigged trees. When using portable spars, the location of the machine or position of the operator shall be such that the operator shall not be endangered by incoming logs. All tail and corner block stumps and trees must be adequately notched.

(P) When the tail or corner lock stumps or trees are unstable, they must be tied back.

(2) Engineers

(A) The yarder engineer must ensure that the chaser is in the clear and out of danger zone before landing a turn of logs.

(B) As the logs approach the landing, the engineer must be responsible for landing the logs safely.

(3) Chokers

(A) Chokers should be placed near the end of the log. This distance however, should not be less than two feet.

(B) In setting or unhooking chokers, care shall be taken to guard against the logs accidentally rolling.

(C) Choker holes shall be dug from the uphill side of the log if there is any danger of the log rolling.

(4) Chasers

- (A) An inexperienced employee may be employed as a chaser only under the direction of an experienced chaser.
 - (B) Chasers shall assure that logs are securely landed before approaching them to unhook chokers.
- (5) Loading – general
- (A) Loading operators shall have an unobstructed view of the landing and of the trucks being loaded.
 - (B) All limbs or knots projecting beyond bunks must be removed before the truck leaves the landing.
 - (C) All landings must be prepared to insure the safest possible landing of logs. Landing chutes must be long and level enough so that at least two-thirds of the standard length log must rest on the landing. This is not intended to restrict the yarding or loading of boom sticks, poles, piling or infrequent logs or trees that were made unsafe to buck in the woods, provided the piece is secured before unhooking the choker. Long sticks must be safely removed before additional logs are landed.
 - (D) In logging operations where the yarder is set up in the haul road and logs are landed on the slope below the road, the following must apply:
 - (i) If logs are to be decked below the road, the logs must be effectively secured from rolling or sliding down the hill; or
 - (ii) If the landing process or weather conditions (rain, snow, ice, and mud) prevent the required log stability and exposes employees to the hazard of rolling or sliding logs, the logs must be decked at a different location.
 - (E) Logs must not be swung over occupied equipment.
 - (F) Trucks must not be moved until it is ascertained that all employees are in the clear.
 - (G) Employees shall not be under any boom while it is being held by the brake.

(H) A positive boom stop must be installed on all machines equipped with a boom which may possibly rise to a position where it could endanger the operator or other employees.

(I) While logs are being loaded, no one shall remain on the load, chain deck or behind the cab protector.

(J) A minimum distance of four feet clearance must be maintained between the counterweight of a loading machine and trees, logs, banks, trucks, etc., while the machine is actively engaged in handling logs. The landing area must be adequate to maintain the required clearance and the stability of logs.

(K) To control the movement of a log truck being loaded, a positive means of communication must be established between the truck driver and the loading engineer.

(6) Yarding, loading and skidding units

(A) Lines shall be securely fastened onto drums. No less than two full wraps shall be maintained on drums at all times. This rule does not apply to the arch lines on skidding tractors.

(B) Power-driven machines, when mounted for use on trucks or trailers, shall be securely anchored.

(o) Truck Logging

(1) Binding Loads

(A) Logging trucks, with or without trailers, hauling logs 42 feet or less in length shall use two binder chains, reasonably separated, which shall be in contact with all outside logs. The logs shall be properly blocked to prevent them from rolling or shifting.

(B) Logs over 42 feet in length shall have three such binders, when hauled over public roads. The logs shall be properly blocked to prevent them from rolling or shifting.

(C) When two binders are required, they shall be applied within six feet of the front and rear bunks. When more than two binders are required, the front and back binder shall be applied within six feet of the front and rear bunks.

(D) To properly secure short logs, binders shall be placed not less than 12 inches from the end of the log.

(E) Wing logs which do not extend 12 inches or more beyond the stakes are not considered secure.

(F) "Gut-wrappers", when used, shall be adjusted so as to be tightened by, but not carry, the weight of the logs above them.

(G) All binder chains or cables shall entirely surround the load. This does not apply to gut-wrappers.

(2) Binders

(A) Binder chains shall be not less than three-eighths inches in diameter made of high test steel and if used with cable, shall be connected to it with welded links of not less than 9/16 inch diameter mild steel. A cable not less than 3/8 inch in diameter with a spliced eye and thimble in each end may be used as a binder.

(B) "Molly Hogans" are prohibited.

(C) Binders shall be placed so that they will be released on the side of the load opposite from the brow log.

(3) Releasing binders

(A) After the truck is loaded and the binder chains secured, the binders shall not be released except to tighten or relocate and then only if one binder is solidly secured.

(B) Before binders can be released, a crotch line or other positive safeguard must be used to prevent logs from rolling off the truck.

(4) Loading

(A) Logging trucks shall be loaded in such a manner that the logs rest securely and the load is stable and well balanced before a binder is placed thereon. The binder chains shall be in place before the truck leaves the loading area.

(B) Employees shall not walk alongside or be underneath any truck being loaded. Prior to performing any duties, such as releasing bunk locks,

placing or removing compensating pin, scaling logs, reading scales, chopping limbs or making connections, the loading engineer shall be advised and his acknowledgement received.

(5) Scaling

(A) Scaling logs while the truck is being loaded or in motion is prohibited.

(B) When scaling and branding is done at the dump or reload, it shall be done before the binder chains are released.

(6) Load limits

(A) Logging truck drivers or operators of other heavy equipment shall observe load limit signs when posted on bridges or other roadway structures.

(7) Truck roads

(A) Truck road grades shall not be too steep for safe operation of the logging or work trucks which operate over them and shall not exceed 20%.

(B) Truck roads shall be of sufficient width and evenness to insure safe operation of the equipment.

(C) Hazardous conditions such as road wash, deep holes, large rocks, logs, etc., which prevent the safe operation of equipment shall be immediately corrected.

(D) Truck roads on blind curves where visibility is less than 300 feet shall be of sufficient width for two trucks to pass, or some type of signal system shall be maintained, or speed limited to 15 miles per hour.

(E) Sufficient turn-outs shall be provided and a safe side clearance maintained along all truck roads.

(F) All snags, trees or rocks, which present a hazard to users of roadways, shall be cleared a safe distance back from the roadway. Brush and other materials that obstruct the view at intersections or on sharp curves shall be cleared and all possible precautions taken to relieve the hazard of these road conditions.

(G) Shear rails shall be installed on both outside edges of bridges. The shear rails shall be made of substantial material securely fastened, capable of withstanding the impact of the wheels of a loaded vehicle. The top of the shear rails shall be not less than 15 inches above the bridge surface.

(H) Control measures shall be instituted to minimize the generation of dust on logging roads so that visibility will permit safe operation of vehicles.

(8) Drivers. No person shall move a truck into a landing except on signal from a designated member of the loading crew who shall assure that all persons are in a safe position.

(p) Log Dumps, Booms and Rafts. (1) General

(A) In operations where regular logging machinery, rigging, etc., is used, the applicable subsections of this section and subsections of 29 C.F.R. 1910.266 shall apply.

(B) Where a single or multiple log dump approach extends into open water, a plank walk no less than three feet wide and hand rail shall be provided on one side of the trestle for its entire length and kept in good repair.

(C) Employees shall not attach lines for dumping or detach binders while the truck is in motion.

(D) Unloading lines shall be so arranged that it is not necessary for employees to attach them on the pond or dump side of the load.

(E) All decks and plankways on log dumps shall be kept in good repair and free from bark and other debris. Roadways shall not be inclined more than one inch to 12 inches.

(F) Unless they will support the weight of at least three persons, the use of small bridge-over logs, planking or timbers between regular foot logs or walkways is prohibited. All regular foot logs shall be barked on the upper side.

(G) One employee working alone on any log dump while logs are being unloaded is prohibited.

(H) Other than boom boat operations, a minimum of two employees shall be assigned to the dump and boom area, one of whom may be the boom boat operator.

(I) A U.S. Coast Guard approved buoyant work device shall be worn by each employee working from small boats, floating logs, boomsticks, walkways or any place where there is danger of drowning, except where guard rails or other suitable protection is provided. Whenever the positive buoyancy of the device diminishes two pounds below its original value, use of the device is prohibited.

(J) Life rings with a minimum of 90 feet of line attached shall be provided at convenient points adjacent to water which is five feet or more in depth. Life rings shall be a minimum of 30 inches outside diameter and 17 inches inside diameter and shall be maintained so as to retain a 32-pound positive buoyancy.

(K) Horseplay and playing on logs is prohibited.

(L) Artificial lights shall be provided and used where work is done in the dark. Such lights shall be located in a manner that will be reasonably free of glare, provide uniform distribution of illumination and avoid sharply defined shadows.

(M) All mobile log handling machines shall be equipped with a means or mechanism which will prevent the logs from accidentally rolling off the forks.

(N) The operator of the unloading machine shall have an unobstructed view of the unloading area or shall make certain no employee is in the area where the logs are to be unloaded. Rearview mirrors shall be installed on mobile log handling equipment to assist the operator in ascertaining that the area behind the machine is clear before backing up. Back-up alarms shall be installed.

(O) All water dumps shall have brow logs except when logs are lifted from the load. If portable equipment is used, adequate stops shall be provided to prevent the equipment from running off the dock.

(2) Log Dumps

(A) When crotch lines are used, two cables or a crotch line must be placed under the load and fastened to the brow log 10 to 20 feet apart

and securely tightened before the binder chains and cheese or chock blocks are released.

(B) A substantial brow log, skid timbers, or the equivalent shall be used in dumping logs unless the loads are lifted directly into the water.

(3) Dry land sorting and storage

(A) Only authorized vehicles shall be operated in the sorting or storage area.

(B) Unauthorized foot traffic is prohibited in the sorting or storage area.

(C) Logs shall be stored in a safe and orderly manner. Roadways and traffic lanes shall be kept clear of protruding ends of logs and debris.

(D) Dry deck log storage areas shall be kept orderly and maintained in a condition conducive to safe operation of mobile equipment.

(E) At log dumps and storage areas, an effective method shall be used to reasonably control the generation of dust.

(F) Unnecessary talking to the operator while he is engaged in operating the controls of the log unloader is prohibited.

(G) Truck drivers shall be in the clear and in view of the log unloader operator before lift forks are moved under the load or the lift is made.

(H) Where logs are off-loaded onto a dry deck by means of unloading lines, a mechanism shall be used which is self-releasing.

(I) Employees shall not position themselves in the hazardous area near or under the loads or logs being lifted or moved. Employees shall not remain in the cab of the truck being unloaded if there is a danger of the load of logs striking the cab while being handled.

(J) Shear guards shall be installed on unloading machines and similar types of equipment on which the arms pivot and move alongside the operator creating a pinch point.

(K) Machines of the type having arms which block the regular exit in the up position shall have an emergency exit.

(L) Identification tags shall not be applied or removed unless logs are resting in a stationary resting place, such as bunks, cradles, skids or sorting tables.

(q) Helicopter Logging

(1) General

(A) Helicopters must comply with any applicable regulations of the Federal Aviation Administration.

(B) Helicopters used for yarding must be equipped with a siren to warn employees of hazardous situations.

(C) Before each day's operation, a briefing must be conducted, setting forth the plan for the pilot and the ground personnel.

(D) Good housekeeping must be maintained in all helicopter loading and unloading areas.

(E) Every practical precaution must be taken to provide for the protection of employees from flying objects in the rotor downwash. All loose gear within one hundred feet from the place of lifting of the load, depositing the load, and all other areas susceptible to rotor downwash, must be secured or removed.

(F) Employees may not perform work under hovering craft except for that limited period of time necessary to hook and unhook loads. Regardless of whether the hooking or unhooking of a load takes place on the ground or other location in an elevated work position, a safe means of access and egress, to include an emergency escape route or routes, must be provided for the employees hooking or unhooking loads.

(G) Riding the load or hook of a helicopter is prohibited except in the case of an emergency and with the proper safety gear.

(H) Static charge on the suspended load must be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves must be worn by all ground personnel touching the suspended load.

(I) Personal protective equipment for employees working in loading and unloading areas must consist of complete eye protection, hard hats secured by chinstraps, and high visibility vests or outer garments.

(2) Ground Operations

(A) If visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of the main and stabilizing rotors. Precautions must also be taken by the employer to eliminate, as far as practical, reduced visibility.

(B) No unauthorized person shall be allowed to approach within 50 feet of the helicopter when the rotor blades are turning.

(C) Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

(D) Sufficient ground personnel must be provided when required for safe helicopter loading and unloading operations.

(E) Signal systems. The employer shall ensure that the aircrew and ground personnel receive instruction on the signal systems to be used and that the system is reviewed with the employees in advance of hoisting the load. This applies to both radio and hand signal systems. Hand signals, where used, must be as shown in Figure N-1 of 29 C.F.R. 1910.183.

(F) There must be constant reliable communication between the pilot and a designated employee of the ground crew who acts as a signal person during loading and unloading operations. This signal person shall be distinctly recognizable from other ground personnel.

(G) Ground lines. Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off at the tree, may not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(H) Open fires must not be permitted in an area that could result in such fires being spread by the rotor downwash.

(3) Flight Path

(A) A takeoff path from the log pick up point must be established and made known to all employees in the area before the first turn of logs is moved.

(B) The helicopter flight path to and from the landing drop zone must be designated and no equipment or employees (other than flight personnel necessary to assist in landing and takeoff) may occupy these areas during helicopter arrival or departure. A flag person must be stationed on each side of the flight path of a turn of logs where it crosses a road or the road must be closed to traffic.

(C) The approach to the loading and unloading area must be clear and long enough to prevent tree tops from being pulled into the landing.

(D) The helicopter must not pass over an area in which cutters are working at an altitude which would cause the rotor downwash to affect a cutter's ability to safely control a tree or cause dislodging of limbs.

(4) Delivery of chokers. Employees shall remain in the clear as chokers are being delivered. Under no circumstances shall employees move under a helicopter that is delivering the chokers or take hold of the chokers before they have been released by the helicopter.

(5) Log Pickup

(A) The weight of an external load must not exceed the manufacturer's rating.

(B) Loads must be properly slung. Tag lines must be of a length that will not permit their being drawn up into the rotors.

(C) Pressed sleeve, swedged eyes, or equivalent means must be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(D) The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift must not be made.

(E) All electrically operated cargo hooks must have the electrical activating device so designed and installed as to prevent inadvertent operations. In addition, these cargo hooks must be equipped with an

emergency mechanical control for releasing the load. The hooks must be tested prior to each day's operation to determine that the release functions properly, both electrically and mechanically.

(F) Log pick up must be arranged in a manner that the hookup crew will not work on slopes below felled and bucked timber.

(G) If the load must be lightened, the hook must be placed on the ground on the uphill side of the turn before the hooker approaches to release the excess logs.

(H) Loose-fitting clothing likely to flap in the downwash and thus be snagged on the hoist line must not be worn.

(6) Loading Drop Zone

(A) The landing drop zone must be at least twice the nominal length of logs to be landed.

(B) The landing drop zone must be not less than 125 feet from the loading or docking area.

(C) The landing crew must be in the clear before logs are dropped.

(D) One end of all the logs in the turn must be touching the ground and lowered to an angle of not more than 45 degrees from the horizontal before the chokers are released.

(E) Logs must be laid on the ground and the helicopter must be completely free of the chokers before employees approach the logs.

(F) If the load will not release from the hook, the load and the hook must be on the ground before employees approach to release the hook manually.

(7) Fueling

(A) Separate areas must be designated for landing logs and fueling the helicopter.

(B) Under no circumstances may the refueling of any type of helicopter with either aviation gasoline or Jet B (turbine) type fuel be permitted while the engine is running.

(C) Helicopters using Jet A (turbine kerosene) type fuel may be refueled with engines running if:

(i) No unauthorized employees are allowed within 50 feet of the refueling operation.

(ii) At least one 30-pound ABC fire extinguisher is within 100 feet on the upwind side of the refueling operation.

(iii) All fueling employees are thoroughly trained in the refueling operation and in the use of the available fire extinguishing equipment they may be expected to use.

(iv) There is no smoking, open flames, exposed flame heaters, flare pots, or open flame lights within 50 feet of the refueling area or fueling equipment. All entrances to the refueling area must be posted with "NO SMOKING" signs.

(v) Before starting refueling operations, the fueling equipment and the helicopter are grounded and the fueling nozzle is electrically bonded to the helicopter. The use of a conductive hose is not acceptable to accomplish this bonding. All grounding and bonding connections must be electrically and mechanically firm to clean unpainted metal parts.

(vi) To control spills, fuel is pumped either by hand or power. Pouring or gravity flow must not be permitted. Self-closing nozzles or deadman controls must be used and must not be blocked open. Nozzles must not be dragged along the ground.

(vii) In case of a spill, the fueling operation is immediately stopped until the person in charge determines that it is safe to resume the refueling operation.

(viii) Ambient temperatures have been in the 100 degree F range for an extended period of time, all refueling of helicopters with the engines running become suitable to resume refueling with the engines running.

(D) Helicopters with their engines stopped while being refueled with aviation gasoline or Jet B (turbine) type fuel must also comply with (i) – (viii) of subparagraph C.

(Eff. 12/6/95, Register 136)