OSHA'S ADOPTED RULE VS. OSHA'S PROPOSED RULE VS. DOSH'S PROPOSED RULE
JULY, 2010

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Sec. 1926.1400 Scope.	**§ 1926.1400 Scope.**	**WAC 296-155-52900 Scope.**
(a) This subpart applies to power-operated equipment used in construction that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: Articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as fixed jib ("hammerhead boom"), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in paragraph (c) of this section are excluded from the scope of this subpart.	(a) This standard applies to power-operated equipment, when used in construction, that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheelmounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/ mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as a fixed jib, i.e., "hammerhead boom"), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in paragraph (c) of this section are excluded from the scope of this standard.	(1) Except as provided in paragraph (3) of this section, this part applies to power-operated cranes and derricks used in construction that can hoist, lower and horizontally move a suspended load (with or without attachments). Such equipment includes, but is not limited to: Articulating boom cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multipurpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as fixed jib ("hammerhead boom"), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; side-boom tractors; derricks; and variations of such equipment.
(b) Attachments. This subpart applies to equipment included in paragraph (a) of this section when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: Hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.	(b) *Attachments*. This standard applies to equipment included in paragraph (a) of this section when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.	(2) Attachments. This standard applies to equipment included in paragraph (1) when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.
(c) Exclusions. This subpart does not cover: (1) Machinery included in paragraph (a) of this section	(c) *Exclusions*. This subpart does not cover: (1) Machinery included in paragraph (a) of this section	Exemptions. WAC 296-155-529 through 296-155-53300 do not apply to the following:

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while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps. (2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles. (4) Service trucks with mobile lifting devices designed specifically for use in the power line and electric service industries, such as digger derricks (radial boom derricks), when used in these industries for auguring holes to set power and utility poles, or handling associated materials to be installed or removed from utility poles. (5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes. (8) Powered industrial trucks (forklifts). (9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair. (10) Machinery that hoists by using a come-a-long or chainfall. (11) Dedicated drilling rigs. (12) Gin poles used for the erection of communication towers. (13) Tree trimming and tree removal work. (14) Anchor handling with a vessel or barge using an affixed A-frame.	while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps. (2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles. (4) Digger derricks when used for augering holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles. Digger derricks used in work subject to 29 CFR part 1926, subpart V, must comply with 29 CFR 1910.269. Digger derricks used in construction work for telecommunication service (as defined at 29 CFR 1910.268(s)(40)) must comply with 29 CFR 1910.268. (5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes. (8) Powered industrial trucks (forklifts), except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load. (9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair. (10) Machinery that hoists by using a come-a-long or chainfall. (11) Dedicated drilling rigs.	(a) Cranes having a maximum rated capacity of one ton or less are exempt from this rule for the purposes of crane certification and operator certification. (b) Equipment included in subsection (1) of this section while it has been converted or adapted for nonhoisting/lifting use. Such conversions/adaptations include, but are not limited to, power shovels, excavators and concrete pumps. (c) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (d) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles. (e) Digger derricks when used for augering holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles. Digger derricks used in work subject to chapter 296-45 WAC, Safety Standards for Electrical Workers, must comply with chapter 296-45 WAC. Digger derricks used in construction work for telecommunication service (as defined in chapter 296-32 WAC, Safety Standards for Telecommunications) must comply with chapter 296-32 WAC. (f) Equipment originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (g) Hydraulic jacking systems, including telescopic/hydraulic gantries. (h) Stacker cranes. (i) Powered industrial trucks (forklifts). (j) Mechanic's truck with a hoisting device when used in

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(15) Roustabouts.	(12) Gin poles when used for the erection of communication towers. (13) Tree trimming and tree removal work. (14) Anchor handling or dredge-related operations with a vessel or barge using an affixed A-frame. (15) Roustabouts. (16) Helicopter cranes.	activities related to equipment maintenance and repair. (k) Equipment that hoists by using a come-a-long or chainfall. (l) Dedicated drilling rigs. (m) Gin poles used for the erection of communication towers. (n) Tree trimming and tree removal work. (o) Anchor handling with a vessel or barge using an affixed A-frame. (p) Roustabouts. (q) Service cranes with booms that rotate manually. (r) Machines equipped with a boom that is limited to up and down movement only and does not rotate. (s) Conveyors. (t) Pump hoists with booms that do not rotate. (u) Cranes used on-site in manufacturing facilities or powerhouses for occasional or routine maintenance and repair work; and (v) Crane operators operating cranes on-site in manufacturing facilities or powerhouses for occasional or routine maintenance and repair work.
	(17) *Material Delivery* (i) Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting. (ii) Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning	

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	automatic overload prevention device. Such sheet goods or packaged materials include, but are not limited to: sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt. (iii) This exclusion does not apply when: (A) The articulating/knuckle-boom crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure; (B) The material being handled by the articulating/knuckle-boom crane is a prefabricated component. Such prefabricated components include, but are not limited to: precast concrete members or panels, roof trusses (wooden, cold-formed metal, steel, or other material), prefabricated building sections such as, but not limited to: floor panels, wall panels, roof panels, roof structures, or similar items; (C) The material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building (as defined in 29 CFR 1926 subpart R). (D) The activity is not specifically excluded under §1400(c)(17)(i) and (ii).	
(d) All sections of this subpart apply to the equipment covered by this subpart unless specified otherwise.	(d) All sections of this subpart CC apply to the equipment covered by this standard unless specified otherwise.	
(e) The duties of controlling entities under this subpart include, but are not limited to, the duties specified in Sec. 1926.1402(c), Sec. 1926.1402(e), and Sec. 1926.1424(b).	(e) The duties of controlling entities under this subpart include, but are not limited to, the duties specified in § 1926.1402(c), § 1926.1402(e) and § 1926.1424(b).	
(f) Where provisions of this subpart direct an operator, crewmember, or other employee to take certain actions, the employer shall establish, effectively communicate to the relevant persons, and enforce work rules, to ensure	(f) Where provisions of this standard direct an operator, crewmember, or other employee to take certain actions, the employer must establish, effectively communicate to the relevant persons, and enforce, work rules to ensure	(4) Where provisions of this standard direct an operator, crewmember, or other employee to take certain actions, the employer must establish, effectively communicate to the relevant persons, and enforce work rules, to ensure

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compliance with such provisions.	compliance with such provisions.	compliance with such provisions.
	(g) For work covered by subpart V of this part, compliance with 29 CFR § 1910.269(p) is deemed compliance with §§ 1926.1407 through 1926.1411.	(5) For work covered by Chapter 296-45 WAC, Safety Standards for Electrical Workers, is deemed in compliance with WAC 296-155-53408.
	(h) Section 1926.1402 does not apply to cranes designed for use on railroad tracks, when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213, and that comply with applicable Federal Railroad Administration requirements. See § 1926.1402(f).	(6) WAC 296-155-53400 (26) through (30) does not apply to cranes designed for use on railroad tracks, when used on railroad tracks that are used as part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR, Part 213, and that comply with applicable Federal Railroad Administration requirements. See WAC 296-155-53400 (30).
		WAC 296-155-52901 Certification and proof load testing – requirement. Effective January 1, 2010, all cranes and derricks covered in WAC 296-155-52900 and not exempt in paragraph (3) of that section, must be certified and proof load tested annually by an accredited crane certifier recognized by the department. Note: For additional inspection criteria and proof load testing requirements for specific types of cranes, see: WAC 296-155-53202 for Mobile cranes. WAC 296-155-53204 for Articulating boom cranes. WAC 296-155-53206 for Tower cranes. WAC 296-155-53208 for Self-erecting tower cranes. WAC 296-155-53210 for Overhead and bridge cranes. WAC 296-155-53212 for Derricks.
Sec. 1926.1401 Definitions.	**§ 1926.1401 Definitions.**	**WAC 296-155-52902 Definitions.**
		Accredited crane certifier means a crane inspector who has been accredited by the department.
A/D supervisor (Assembly/Disassembly supervisor) means an individual who meets this standard's requirements for an	*A/D director (Assembly/Disassembly director)* means an individual who meets this subpart's requirements for an A/D	**A/D Director (Assembly/Disassembly director)** means an individual who meets the requirements in this part for an

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A/D supervisor, irrespective of the person's formal job title or whether the person is non-management or management personnel.	director, irrespective of the person's formal job title or whether the person is non-management or management personnel.	A/D director, irrespective of the person's formal job title or whether the person is non-management or management personnel.
		Angle of loading means the acute angle between horizontal and the leg of the rigging, often referred to as horizontal angle. See Figures 18 and 33. (ASME B30.9 and 26)
		Anti two-block device means a device that, when activated, disengages all crane functions whose movement can cause two-blocking. (ASME B30.5)
		Apprentice operator or trainee means a crane operator who has not met requirements established by the department under RCW 49.17.430.
Articulating crane means a crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.	*Articulating crane* means a crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.	**Articulating boom crane** means a crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.
Assembly/Disassembly means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, "erecting and climbing" replaces the term "assembly," and "dismantling" replaces the term "disassembly."	*Assembly/Disassembly* means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, "erecting and climbing" replaces the term "assembly," and "dismantling" replaces the term "disassembly." Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.	**Assembly/Disassembly** means the assembly and/or disassembly of equipment covered under this part. With regard to tower cranes, "erecting and climbing" replaces the term "assembly," and "dismantling" replaces the term "disassembly." Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing height of the crane is an erection process.
Assist crane means a crane used to assist in assembling or disassembling a crane.	*Assist crane* means a crane used to assist in assembling or disassembling a crane.	**Assist crane** means a crane used to assist in assembling or disassembling a crane.
Attachments means any device that expands the range of tasks that can be done by the equipment. Examples include, but are not limited to: An auger, drill, magnet, pile-driver, and boom-attached personnel platform.	*Attachments* means any device that expands the range of tasks that can be done by the equipment. Examples include, but are not limited to: an auger, drill, magnet, pile-driver, and boom-attached personnel platform.	**Attachments** means any device that expands the range or tasks that can be done by the equipment. Examples include~~:~~, but are not limited to: an auger, drill, magnet, pile-driver, and boom-attached personnel platform.
Audible signal means a signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.	*Audible signal* means a signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.	**Audible signal** means a signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.

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		Basket hitch means a method of rigging a sling in which the sling is passed around the load and both loop eyes or end fittings are attached to the lifting device. (ASME B30.9)
		Below-the hook lifting device means a device used for attaching loads to a hoist. The device may contain components such as slings, hooks, rigging hardware, and lifting attachments. (ASME B30.20)
		Bird caging means the twisting of fiber or wire rope in an isolated area of the rope in the opposite direction of the rope lay, thereby causing it to take on the appearance of a bird cage.
Blocking (also referred to as "cribbing") is wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support latticed boom sections during assembly/ disassembly and under outrigger floats.	*Blocking* (also referred to as "cribbing") is wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support lattice boom sections during assembly/ disassembly and under outrigger and stabilizer floats.	**Blocking (also referred to as "cribbing")** means wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support latticed boom sections during assembly/disassembly and under outrigger and stabilizer floats.
Boatswain's chair means a single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.	*Boatswain's chair* means a single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.	**Boatswain's Chair** means a single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.
Bogie means "travel bogie," which is defined below.	*Bogie* means "travel bogie," which is defined below.	**Bogie**. See "travel bogie."
Boom (equipment other than tower crane) means an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	*Boom (equipment other than tower crane)* means an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	**Boom (equipment other than tower crane)** means an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.
Boom (tower cranes): On tower cranes, if the "boom" (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a	*Boom (tower cranes)*: On tower cranes, if the "boom" (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a	**Boom (tower cranes)** on tower cranes: If the "boom" (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a

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boom.	boom.	boom.
Boom angle indicator means a device which measures the angle of the boom relative to horizontal.	*Boom angle indicator* means a device which measures the angle of the boom relative to horizontal.	**Boom angle indicator** means a device which measures the angle of the boom relative to horizontal.
Boom hoist limiting device includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.	*Boom hoist limiting device* includes boom hoist disengaging device, boom hoist shutoff, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.	**Boom hoist limiting device** includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.
Boom length indicator indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	*Boom length indicator* indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	**Boom length indicator** indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.
Boom stop includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.	*Boom stop* includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.	**Boom stop** includes boom stops (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.
Boom suspension system means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	*Boom suspension system* means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	**Boom suspension systems** means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.
		Braided wire rope means a wire rope formed by plaiting component wire ropes. (ASME B30.9 & Ch. 24)
		Bridle wire rope sling means a sling composed of multiple legs with the top ends gathered in a fitting that goes over the lifting hook. (ASME B30.9 & Ch. 24)
Builder means ~~an employer~~ builder/constructor of equipment.	*Builder* means the builder/constructor of equipment.	**Builder** means ~~an employer~~the builder/constructor of equipment.
		Cable laid endless sling-mechanical joint means a wire

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		rope sling made endless from one continuous length of cable laid rope with the ends joined by one or more metallic fittings. (ASME B30.9)
		Cable laid grommet-hand tucked means an endless wire rope sling made from one continuous length of rope formed to make a body composed of six ropes around a rope core. The rope ends are tucked into the body, thus forming the core, No sleeves are used. (ASME B30.9)
Calculate includes use of a calculator.		NO DOSH COMPARABLE
Center of gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.	*Center of gravity*: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.	**Center of gravity:** The center of gravity of any ~~means the point in an~~ object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.
		Certified crane inspector means a crane certifier accredited by the department.
Certified welder means a welder who meets nationally recognized certification requirements applicable to the task being performed.	*Certified welder* means a welder who meets nationally recognized certification requirements applicable to the task being performed.	**Certified welder** means a welder who meets nationally recognized certification requirements applicable to the task being performed.
		Choker hitch means a method of rigging a sling in which the sling is passed around the load, then through one loop eye, end fitting, or other device, with the other loop eye or end fitting attached to the lifting device. This hitch can be done with a sliding choker hook or similar device. (ASME B30.9)
Climbing means the process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).	*Climbing* means the process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).	**Climbing** means the process in which a tower crane is raised or lowered to a new working height, either by adding or removing ~~additional~~ tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised or lowered inside the structure (inside climbing).
Come-a-long means a mechanical device typically consisting of a chain or cable attached at each end that is	*Come-a-long* means a mechanical device typically consisting of a chain or cable attached at each end that is	**Come-a-long** means a mechanical device typically consisting of a chain or cable attached at each end that is

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used to facilitate movement of materials through leverage.	used to facilitate movement of materials through leverage.	used to facilitate movement of materials through leverage.
Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.	*Competent person* means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.	**Competent person** means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
Controlled load lowering means lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.	*Controlled load lowering* means lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.	**Controlled load lowering** means lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.
Controlling entity means a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project--its planning, quality and completion.	*Controlling entity* means an employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project – its planning, quality and completion.	**Controlling entity** means an employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the projects - ~~, including~~ its planning, quality and completion.
		Counterjib (counterweight jib) means a horizontal member of the tower crane on which the counterweights and usually the hoisting machinery are mounted.
Counterweight means a weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.	*Counterweight* means a weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.	**Counterweight** means weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.
Crane/derrick includes all equipment covered by this subpart.	*Crane/derrick* includes all equipment covered by this subpart.	**Crane** means power-operated equipment used in construction that can hoist, lower, and horizontally move a suspended load. "Crane" includes, but is not limited to: Articulating boom cranes, such as knuckle-boom cranes; crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes, such as wheel-mounted, rough-terrain, all-terrain, commercial truck mounted, and

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		boom truck cranes; multipurpose machines when configured to hoist and lower by means of a winch or hook and horizontally move a suspended load; industrial cranes, such as carry-deck cranes; dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes, such as fixed jib, hammerhead boom, luffing boom, and self-erecting; pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; side-boom tractors; derricks; and variations of such equipment.
		Crane/derrick type means cranes or derricks as established by American Society of Mechanical Engineers (ASME). Crane operator means an individual engaged in the operation of a crane.
		Crane level indicator means a device for determining true horizontal (also see safety devices).
Crawler crane means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.	*Crawler crane* means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.	**Crawler crane** means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.
		Critical lift means a lift that: • Exceeds seventy-five percent of the crane or derrick rated load chart capacity; or • Requires the use of more than one crane or derrick.
		Cross rod means a wire used to join spirals of metal mesh to form a complete fabric (See Figure 22 located in WAC 296-155-55810). (ASME B30.9 & Ch. 24)
Crossover points means locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum,	*Crossover points* means locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum,	**Crossover points** means locations on a wire rope which is spooled on a drum where one layer of rope climbs up on and crosses over the previous layer. This takes place at each flange of the drum as the rope is spooled onto the drum,

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reaches the flange, and begins to wrap back in the opposite direction.	reaches the flange, and begins to wrap back in the opposite direction.	reaches the flange, and begins to wrap back in the opposite direction.
Dedicated channel means a line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).	*Dedicated channel* means a line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).	**Dedicated channel** means a line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).
		Dedicated drilling rig means a machine which creates bore holes and/or shafts in the ground.
Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.	*Dedicated pile-driver* is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.	**Dedicated pile-driver** is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.
Dedicated spotter (power lines): In order to be considered a dedicated spotter, the requirements of Sec. 1926.1428 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and: the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.	*Dedicated spotter (power lines)*: To be considered a dedicated spotter, the requirements of § 1926.1428 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and: the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.	**Dedicated spotter (power lines)** To be considered a dedicated spotter ~~means a person who meets~~ the requirements of WAC 296-155-53302 (signal person qualifications) must be met and ~~whose~~his/her sole responsibility is to watch the separation between the power line and; the equipment, the load line and ~~the~~ load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.
		Derrick is an apparatus consisting of a mast or equivalent member held at the end by guys or braces, with or without a boom, for use with a hoisting mechanism and operating ropes.
		Design factor means the ratio between nominal or minimum breaking strength and rated load. (ASME B30.9)
Directly under the load means a part or all of an employee is directly beneath the load.	*Directly under the load* means a part or all of an employee is directly beneath the load.	**Directly under the load** means a part or all of an employee is directly beneath the load.
Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different	*Dismantling* includes partial dismantling (such as dismantling to shorten a boom or substitute a different	**Dismantling** includes partial dismantling (such as dismantling to shorten a boom or substitute a different

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component).	component).	component).
Drum rotation indicator means a device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	*Drum rotation indicator* means a device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	**Drum rotation indicator** is a device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.
Electrical contact occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.	*Electrical contact* occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.	**Electrical contact** means when a person, object, or equipment makes contact or comes close in proximity with an energized conductor or equipment that allows the passage of current.
Employer-made equipment means floating cranes/derricks designed and built by an employer for the employer's own use.	*Employer-made equipment* means floating cranes/derricks designed and built by an employer for the employer's own use.	**Employer-made equipment** means floating cranes/derricks ~~equipment~~ designed and built by an employer for ~~its~~ the employer's own use.
Encroachment is where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this subpart requires to be maintained from a power line.	*Encroachment* is where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this subpart requires to be maintained from a power line.	**Encroachment** is where ~~means when~~ any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this part requires to be maintained from a power line.
Equipment means equipment covered by this subpart.	*Equipment* means equipment covered by this subpart.	**Equipment** means equipment covered by this part.
Equipment criteria means instructions, recommendations, limitations and specifications.	*Equipment criteria* means instructions, recommendations, limitations and specifications.	**Equipment criteria** means instructions, recommendations, limitations and specifications.
		Fabric (metal mesh) means the flexible portion of the sling exclusive of end fittings consisting of a series of transverse spirals and cross rods. (ASME B30.9)
Fall protection equipment means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	*Fall protection equipment* means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	**Fall protection equipment** means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.
Fall restraint system means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.	*Fall restraint system* means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.	**Fall restraint system** means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.
Fall zone means the area (including but not limited to the	*Fall zone* means the area (including but not limited to the	**Fall zone** means the area (including but not limited to the

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area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.	area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.	area directly beneath the load) in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.
Flange points are points of contact between rope and drum flange where the rope changes layers.	*Flange points* are points of contact between rope and drum flange where the rope changes layers.	**Flange points** means a point of contact between rope and drum flange where the rope changes layers.
Floating cranes/derricks means equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.	*Floating cranes/derricks* means equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.	**Floating cranes/derricks** means equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.
For example means "one example, although there are others."	*For example* means "one example, although there are others."	NO DOSH COMPARABLE
Free fall (of the load line) means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).	*Free fall (of the load line)* means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).	**Free fall (of the load line)** means when only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).
		Free rated load test means testing stability and operation of crane, carrier, wheels, tires, tracks, brakes, etc., under load, when lifting without outriggers and/or traveling with the load are permitted at the activity for the type of crane being tested.
Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.	*Free surface effect* is the uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.	**Free surface effect** ~~means~~is the uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.
		Functional testing means the testing of a crane, typically done with a light load or no load, to verify the proper operation of a crane's primary function, i.e. hoisting, braking, booming, swinging, etc. A functional test is contrasted to testing the crane's structural integrity with heavy loads.
		Gin pole derrick means a boom without a mast which has guys arranged from its top to permit leaning the mast in one or more directions. The load is lifted and lowered by ropes

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		reeved through sheaves or blocks at the top of the mast and the lower block. See Figure 45.
		"Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness).
		Ground crew means those individuals who are involved in the personnel lift, other than the hoisting equipment operator and the platform occupants. These individuals include riggers, signalpersons, and supervision. (ASME B30.23)
		Gudgeon pins means a pin connecting the mast cap to the mast allowing rotation of the mast.
		Guy means a rope used to steady or secure the mast, boom, or other member in the desired position.
		Hairpin anchors means a hairpin-shaped, guy-supporting anchor that is placed in footings or walls before concrete is poured and held in place by the cured concrete.
		Hitch (hitched) means a method of rigging (attaching) a sling temporarily to a load or object for the purpose of lifting. (ASME B30.9)
Hoist means a mechanical device for lifting and lowering loads by winding rope onto or off a drum.	*Hoist* means a mechanical device for lifting and lowering loads by winding a line onto or off a drum.	**Hoist** means a mechanical device for lifting and lowering loads by winding rope onto or off a drum.
Hoisting is the act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, "hoisting" can be done by means other than wire rope/ hoist drum equipment.	*Hoisting* is the act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, "hoisting" can be done by means other than wire rope/ hoist drum equipment.	**Hoisting** means the act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, "hoisting" can be done by means other than wire rope/hoist drum equipment.
		Hoisting equipment means a machine for lifting or lowering a load and moving it horizontally. The machine may be fixed or mobile and be driven manually, by power, or by a combination of both. (ASME B30.23)
		Hook latch means a mechanical device used to close the throat opening of a hook. (ASME B30.10)

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Include/including means "including, but not limited to."	*Include/including* means "including, but not limited to."	NO DOSH COMPARABLE
Insulating link/device means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	*Insulating link/device* means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	**Insulating link/device** means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.
		Intermediate rail means the middle member of a barrier along the edges of a platform, located approximately one-half the distance between the platform floor and the top rail. (ASME B30.23)
Jib stop (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.	*Jib stop* (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.	**Jib** means an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles in the vertical plane of the boom. For tower cranes, see boom (tower cranes).
Land crane/derrick is equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.	*Land crane/derrick* is equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.	**Land crane/derrick** means equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of flotation.
List means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	*List* means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	**List** means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of flotation.
		Live boom means a boom whose lowering is controlled by a brake without the aid of other lowering retarding devices (free-fall capable). (ASME B30.23)
		Live load line means a load line whose lowering is controlled by a break without the aid of other lowering retarding devices (free-fall capable). (ASME B30.23)
Load refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.	*Load* refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.	**Load** is the weight of the object being lifted or lowered, including the weight of the load-attaching equipment such as the load block, ropes, slings, shackles, and any other auxiliary attachment.
Load moment (or rated capacity) indicator means a system which aids the equipment operator by sensing the	*Load moment (or rated capacity) indicator* means a system which aids the equipment operator by sensing (directly or	**Load moment (or rated capacity) indicator** means a system which aids the equipment operator by sensing the

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overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.	indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.	overturning moment on the equipment, i.e., load X radius. It compares this lifting condition to the equipment's rated capacity, and indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.
Load moment (or rated capacity) limiter means a system which aids the equipment operator by sensing the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.	*Load moment (or rated capacity) limiter* means a system which aids the equipment operator by sensing (directly or indirectly) the overturning moment on the equipment, i.e., load multiplied by radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.	**Load moment (or rated capacity) limiter** means a system which aids the equipment operator by sensing the overturning moment on the equipment, i.e., load X radius. It compares this lifting condition to the equipment's rated capacity, and when the rated capacity is reached, it shuts off power to those equipment functions which can increase the severity of loading on the equipment, e.g., hoisting, telescoping out, or luffing out. Typically, those functions which decrease the severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.
		Load ratings means a set of rated loads for stipulated hoisting equipment configurations and operating conditions. (ASME B30.23)
		Load sustaining/bearing parts means those parts of a crane that support the crane or load and upon failure could cause dropping, uncontrolled shifting, or uncontrolled movement of the crane or load.
Locomotive crane means a crane mounted on a base or car equipped for travel on a railroad track.	*Locomotive crane* means a crane mounted on a base or car equipped for travel on a railroad track.	**Locomotive crane** means a crane mounted on a base or car equipped for travel on a railroad track.
		Luffing boom is a member hinged to the rotating superstructure and used for supporting the hoisting tackle.
Luffing jib limiting device is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	*Luffing jib limiting device* is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	**Luffing jib limiting device** is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.

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Marine hoisted personnel transfer device means a device, such as a "transfer net," that is designed to protect the employees being hoisted during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain's chairs when hoisted by equipment covered by this standard.	*Marine hoisted personnel transfer device* means a device, such as a "transfer net," that is designed to protect the employees being hoisted during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain's chairs when hoisted by equipment covered by this standard.	NO DOSH COMPARABLE
Marine worksite means a construction worksite located in, on or above the water.	*Marine worksite* means a construction worksite located in, on or above the water.	**Marine worksite** means a construction worksite located in, on or above the water.
		Master coupling link means an alloy steel welded coupling link used as an intermediate link to join alloy steel chain to master links. (ASME B30.9 & Ch. 24)
		Master link means forged or welded steel link used to support all members (legs) of an alloy steel chain sling or wire rope sling. (ASME B30.9 & Ch. 24)
		Mechanical coupling link (alloy steel chain) means a non-welded, mechanically closed link used primarily to attach fittings to alloy steel chain. (ASME B30.9)
Mobile crane means a lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.	*Mobile crane* means a lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.	**Mobile cranes** means a lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road. These are referred to in Europe as a crane mounted on a truck carrier.
Moving point-to-point means the times during which an employee is in the process of going to or from a work station.	*Moving point-to-point* means the times during which an employee is in the process of going to or from a work station.	**Moving point-to-point** means the times during which an employee is in the process of going to or from a work station.
Multi-purpose machine means a machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When	*Multi-purpose machine* means a machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When	Multi-purpose machine means a machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch. When

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configured with the tongs, it is not covered by this subpart. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this subpart.	configured with the forks/tongs, it is not covered by this subpart. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this subpart.	configured with the forks/tongs, it is not covered by this subpart. When configured with a winch pack, jib (with a hook at the end) or jib used in conjunction with a winch, it is covered by this subpart.
		Multiple lift rigging means a rigging assembly manufactured by wire rope rigging suppliers that facilitates the attachment of up to five independent loads to the hoist rigging of a crane.
Nationally recognized accrediting agency is an organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations.	*Nationally recognized accrediting agency* is an organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations. Examples of such accrediting agencies include, but are not limited to, the National Commission for Certifying Agencies and the American National Standards Institute.	**Nationally recognized accrediting agency** is an organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations.
Non-conductive means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).	*Nonconductive* means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).	**Nonconductive** means that, because of the nature and condition of the materials, used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).
		Nonstandard tower crane base means any deviation from the structural support or base configuration recommended by the crane manufacturer.
		Occasional or routine maintenance and repair work means regular, customary and foreseeable work necessary to keep equipment in good repair and/or condition. This also includes regular, customary and foreseeable work necessary to return equipment to sound condition after damage.
Operational aids are devices that assist the operator in the safe operation of the crane by providing information or	*Operational aids* are devices that assist the operator in the safe operation of the crane by providing information or	**Operational aid** means an accessory that provides information to facilitate operation of a crane or that takes

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automatically taking control of a crane function. These include, but are not limited to, the devices listed in Sec. 1926.1416 ("listed operational aids").	automatically taking control of a crane function. These include, but are not limited to, the devices listed in § 1926.1416 ("listed operational aids").	control of particular functions without action of the operator when a limiting condition is sensed. Examples of such devices include, but are not limited to, the following: Anti-two-block device, rated capacity indicator, rated capacity (load) limiter, boom angle or radius indicator, lattice boom hoist disconnect device, boom length indicator, drum rotation indicator, load indicator, and wind speed indicator.
Operational controls means levers, switches, pedals and other devices for controlling equipment operation.	*Operational controls* means levers, switches, pedals and other devices for controlling equipment operation.	**Operational controls** means levers, switches, pedals and other devices for controlling equipment operation.
Operator means a person who is operating the equipment.	*Operator* means a person who is operating the equipment.	**Operator** is a person who is operating the equipment.
		Outriggers means extendable or fixed members attached to the mounting base, which rests on supports at the outer ends, used to support the crane. (ASME B30.5)
Overhead and gantry cranes includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.	*Overhead and gantry cranes* includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.	**Overhead and gantry cranes** includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.
Paragraph refers to a paragraph in the same section of this subpart that the word "paragraph" is used, unless otherwise specified.	*Paragraph* refers to a paragraph in the same section of this subpart that the word "paragraph" is used, unless otherwise specified.	**Paragraph** refers to a paragraph in the same section of this part that the word "paragraph" is used, unless otherwise specified.
Pendants includes both wire and bar types. Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.	*Pendants* includes both wire and bar types. Wire type: a fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type: instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.	**Pendants** includes both wire and bar types. Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.
Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a	*Personal fall arrest system* means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a	**Personal fall arrest system** means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, and a body harness and may include

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lanyard, deceleration device, lifeline, or suitable combination of these.	lanyard, deceleration device, lifeline, or suitable combination of these.	a lanyard, deceleration device, lifeline, or suitable combination of these.
		Personnel lifting means raising, lowering, or transporting personnel using hoisting equipment. (ASME B30.23)
		Personnel platform—boom attached means a platform attached to the boom of the hoist equipment. (ASME B30.23)
		Personnel platform—suspended means a platform attached to hoisting equipment using wire rope, chain, or a jointed attachment and that has no installed motion controls for the platform itself. (ASME B30.23)
		Personnel Platform Suspension system means the rope or chain slings and other components, including fastening devices, used to connect the hoisting equipment to the personnel platform. (ASME B30.23)
		Platform occupant means a person who is within the guardrail barrier while the personnel platform is in a hoisted position. (ASME B30.23) delete??
		Platform rating means the maximum capacity of a personnel lifting platform, established by the platform manufacturer, in terms of total weight and the number of occupants allowed. (ASME B30.23)
Portal crane is a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	*Portal crane* is a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	**Portal crane,** ~~Portal means~~is a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.
		Power controlled lowering means a system or device in the power train, other than the load hoist brake, that can regulate the lowering rate of speed of the load hoist mechanism. (ASME B30.23)

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		Powerhouse means a plant wherein electric energy is produced by conversion from some other form of energy (e.g., chemical, nuclear, solar, mechanical, or hydraulic) by means of suitable apparatus. This includes all generating station auxiliaries and other associated equipment required for the operation of the plant. Not included are stations producing power exclusively for use with communication systems.
Power lines means electric transmission and distribution lines.	*Power lines* means electric transmission and distribution lines.	**Power lines** means electrical distribution and electrical transmission lines.
Procedures include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols, and limitations.	*Procedures* include, but are not limited to: instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.	**Procedures include~~:~~, but are not limited to:** instructions, diagrams, recommendations, warnings, specifications, protocols, and limitations.
Proximity alarm is a device that provides a warning of proximity to a power line that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	*Proximity alarm* is a device that provides a warning of proximity to a power line and that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	**Proximity alarm** ~~means~~is a device that provides a warning of proximity to a power line that has been listed, labeled or accepted ~~approved~~ by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.
		Qualified crane operator means a crane operator who meets the requirements established by the department under RCW 49.17.430.
Qualified evaluator (not a third party) means a person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	*Qualified evaluator (not a third party)* means a person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	**Qualified evaluator (not a third party)** means a person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the qualification requirements in this part for a signal person.
Qualified evaluator (third party) means an entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	*Qualified evaluator (third party)* means an entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	**Qualified evaluator (third party)** means an ~~independent~~ entity that, due to its independence and expertise, has ~~is widely recognized as having~~ demonstrated that it is ~~its~~ competent~~ce to~~in accurately assessing whether individuals meet the qualification requirements in this part for a signal person.
Qualified person means a person who, by possession of a	*Qualified person* means a person who, by possession of a	**Qualified person** means a person who, by possession of a

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recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.	recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.	recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/resolve problems relating to the subject matter, the work, or the project.
Qualified rigger is a rigger who meets the criteria for a qualified person.	*Qualified rigger* is a rigger who meets the criteria for a qualified person.	Qualified rigger is a rigger who meets the criteria for a qualified person.
		Qualified signalperson is a signalperson who meets the criteria for a qualified person.
	Range control limit device is a device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.	*Range control limit device* is a device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.
Range control warning device is a device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.	*Range control warning device* is a device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.	**Range control warning device** ~~means~~ is a device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.
Rated capacity means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	*Rated capacity* means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	**Rated capacity** means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.
Rated capacity indicator: See load moment indicator.	*Rated capacity indicator*: See load moment indicator.	**Rated capacity indicator**, see load moment indicator.
Rated capacity limiter: See load moment limiter.	*Rated capacity limiter*: See load moment limiter.	**Rated capacity limiter**, see load moment limiter.
Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	*Repetitive pickup points* refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	**Repetitive pickup points** ~~means~~ refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.
		Rotation resistant rope means a type of wire rope construction which reduces the tendency of a rope to rotate about its axis under load. Usually, this consists of an inner system of core strands laid in one direction covered by an

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		outer system of strands laid in the opposite direction.
		RPE means a registered professional engineer licensed under RCW 18.43.040(1).
		RPSE means a registered professional structural engineer licensed under RCW 18.43.040(1).
Running wire rope means a wire rope that moves over sheaves or drums.	*Running wire rope* means a wire rope that moves over sheaves or drums.	**Running wire rope** is a wire rope that moves over sheaves or drums.
Runway means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.	*Runway* means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.	**Runway** means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.
		Safety devices, examples of safety devices are, but are not limited to, the following: Horn, boom/jib or trolley stops, crane level indicator, hydraulic holding device/check valve, rail clamps, rail stops, brakes, deadman control or forced neutral return control, emergency stop switch, guards, handrails, audible and visual alarms, etc.
		Safety or health standard means a standard adopted under this chapter.
Section means a section of this subpart, unless otherwise specified.	*Section* means a section of this subpart, unless otherwise specified.	**Section** means a section of this part, unless otherwise specified.
Sideboom crane means a track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.	*Sideboom crane* means a track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.	**Side-boom crane** means a track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering, or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.
		Sling means an assembly to be used for lifting when connected to a lifting mechanism. The upper portion of the sling is connected to the lifting mechanism and the lower supports the load, as described in this part. (ASME B30.9)
Special hazard warnings means warnings of site-specific	*Special hazard warnings* means warnings of site-specific	**Special hazard warnings** means warnings of site-specific

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hazards (for example, proximity of power lines).	hazards (for example, proximity of power lines).	hazards (for example, proximity of power lines).
		Spiral means a single transverse coil that is the basic element from which metal mesh is fabricated. (See Figure 22.) (ASME B30.9 & Ch. 24)
Stability (flotation device) means the tendency of a barge, pontoons, vessel or other means of floatation to return to an upright position after having been inclined by an external force.	*Stability (flotation device)* means the tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.	**Stability (flotation device)** means the tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.
		Stabilizer means an extendable or fixed member attached to the mounting base to increase the stability of the crane, but that may not have the capability of relieving all of the weight from the wheels or tracks. (ASME B30.5)
Standard Method means the protocol in Appendix A of this subpart for hand signals.	*Standard Method* means the protocol in Appendix A of this subpart for hand signals.	**Standard method** means the hand signals established in the applicable ASME B30 series~~.3-2004 and ASME B30.5-2004~~ and WAC 296-155-56400, Mobile Crane Hand Signal Chart.
		Standing wire rope means a supporting wire rope which maintains a constant distance between the points of attachment to the two components connected by the wire rope.
Such as means "such as, but not limited to."	*Such as* means "such as, but not limited to."	NO DOSH COMPARABLE
Superstructure: See Upperworks.	*Superstructure*: See Upperworks.	**Superstructure:** See upperworks~~structure~~.
		"Supporting materials" means blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.
Tagline means a rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	*Tagline* means a rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	**Taglines** means a rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.
Tender means an individual responsible for monitoring and communicating with a diver.	*Tender* means an individual responsible for monitoring and communicating with a diver.	**Tender** means an individual responsible for monitoring and communicating with a diver.

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Tilt up or tilt down operation means raising/lowering a load from the horizontal to vertical or vertical to horizontal.	*Tilt up or tilt down operation* means raising/lowering a load from the horizontal to vertical or vertical to horizontal.	**Tilt up or tilt down operation** means raising/ ~~or~~ lowering a load from the horizontal to vertical or vertical to horizontal.
		Toe board means a vertical barrier at foot level, along the edges of the platform, to protect against material from falling over the edge. (B30.23)
		Top rail means the top member of a barrier along the edges of a platform to protect against persons from falling off the platform. (ASME B30.23)
Tower crane is a type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations.	*Tower crane* is a type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with luffing jib and/or tower attachments are not considered tower cranes under this section.	**Tower crane** means a type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal~~ly~~ or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of ~~about~~ the tower (top slewing) or by the rotation of the tower (bottom slewing) ~~center to swing loads~~. The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with luffing jib and/or tower attachment are noto considered tower cranes under this section.
		Travel means the function of the hoisting equipment moving under its own power from one location to another. (ASME B30.23)
Travel bogie (tower cranes) is an assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.	*Travel bogie (tower cranes)* is an assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.	**Travel bogie (tower cranes)** means an assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.
Trim means angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.	*Trim* means angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.	**Trim** means the angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of flotation.
Two blocking means a condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component.	*Two blocking* means a condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component.	**Two blocking** means a condition in which a component that is uppermost on the hoist line such as the load block, hook block, overhaul ball, or similar component, comes in contact with the boom tip, fixed upper block or similar component.

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This binds the system and continued application of power can cause failure of the hoist rope or other component.	This binds the system and continued application of power can cause failure of the hoist rope or other component.	This binds the system and continued application of power can cause failure of the hoist rope or other component. MAY NEED TO ADD "TWO-BLOCKING WARNING FEATURE" & TWO-BLOCK DAMAGE PREVENTION FAILURE" FROM b30.5
Unavailable procedures means procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	*Unavailable procedures* means procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	**Unavailable procedures** means procedures that are no longer available from the manufacturer, or have never been available from the manufacturer.
Upperstructure: See upperworks.	*Upperstructure*: See Upperworks.	**Upperstructure:** See upperworks.
Upperworks means the revolving frame of equipment on which the engine and operating machinery are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.	*Upperworks* means the revolving frame of equipment on which the operating machinery (and many cases the engine) are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.	**Upperworks** ~~**(also referred to as superstructure or upperstructure)**~~ means the revolving frame of equipment on which the operating machinery (and many cases the engine) ~~and operating machinery~~ are mounted along with the operator's cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.
Up to means "up to and including."	*Up to* means "up to and including."	**Up to** means "up to and including."
		Vertical hitch means a method of rigging a sling in which the load is attached to the loop eye or end fitting at one end of the sling and the loop eye or end fitting at the other end is attached to the lifting device. Any hitch less than 5 deg from the vertical may be considered a vertical hitch. (ASME B30.9)
		ADD OSHA'S DEFINITON OF WALKING/working surface from Part M in 1926.
Wire rope means rope made of wire.	*Wire rope* means a flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.	**Wire rope** means a flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope~~made of wire~~.

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		Working load means the external load applied to the hoisting equipment, including the personnel lifting platform, its contents, and the load attaching equipment, such as lowered load block, shackles, and slings. (ASME B30.23)
Sec. 1926.1402 Ground conditions.	**§ 1926.1402 Ground conditions.**	
(a) Definitions. (1) "Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness). (2) "Supporting materials" means blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.	(a) *Definitions.* (1) "Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness). (2) "Supporting materials" means blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.	Will be added to the definition section.
(b) The equipment shall not be assembled or used unless ground conditions are firm, drained ~~(except for marshes/wetlands)~~, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met.	(b) The equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.	**WAC 296-155-53400(34)** (34) The crane/derrick must not be assembled or used unless ground conditions are firm, drained and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the crane/derrick manufacturer's specifications for adequate support and degree of level of the crane/derrick are met. The requirement for the ground to be drained does not apply to marshes/wetlands.
(c) The controlling entity shall: (1) Ensure that ground preparations necessary to meet the requirements in paragraph (b) of this section are provided. (2) Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) that are identified in documents (such as site drawings, as-built drawings, and soil analyses) if they are available to the controlling entity.	(c) The controlling entity must: (1) Ensure that ground preparations necessary to meet the requirements in paragraph (b) of this section are provided. (2) Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.	**WAC 296-155-53400(36)** (36) The controlling entity must: (a) Ensure that ground preparations necessary to meet the requirements in subsection (34) of this section are provided. (b) Inform the user of the crane/derrick and the operator of the location of hazards beneath the crane/derrick set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as-built drawings, and soil analyses) if they are available to the controlling entity that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to

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		that controlling entity.
(d) If there is no controlling entity for the project, the requirement in paragraph (c)(1) of this section shall be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet paragraph (b) of this section.	(d) If there is no controlling entity for the project, the requirement in paragraph (c)(1) of this section must be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet paragraph (b) of this section.	**WAC 296-155-53400(37)** (37) If there is no controlling entity for the project, the requirement in subsection (36)(a) of this section must be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet subsection (34) of this section.
(e) If the A/D supervisor or the operator determines that ground conditions do not meet the requirements in paragraph (b) of this section, that person's employer shall have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements in paragraph (b) of this section can be met.	(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in paragraph (b) of this section, that person's employer must have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements in paragraph (b) of this section can be met.	**WAC 296-155-53400(38)** (38) If the assembly/disassembly director or the operator determines that ground conditions do not meet the requirements in subsection (34) of this section, that person's employer must have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements in subsection (34) of this section can be met.
	(f) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213 and that comply with applicable Federal Railroad Administration requirements.	**WAC 296-155-53400(39)** (39) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR, part 213, and that comply with applicable Federal Railroad Administration requirements.
Sec. 1926.1403 Assembly/Disassembly--selection of manufacturer or employer procedures.	**§ 1926.1403 Assembly/Disassembly – selection of manufacturer or employer procedures.**	**WAC 296-155-53402 Assembly/Disassembly**
When assembling and disassembling equipment (or attachments), the employer shall comply with either: (a) Manufacturer procedures applicable to assembly and disassembly, or (b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the	When assembling or disassembling equipment (or attachments), the employer must comply with all applicable manufacturer prohibitions and must comply with either: (a) Manufacturer procedures applicable to assembly and disassembly, or (b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer	(1) When assembling and disassembling equipment (or attachments), the employer must comply with all applicable manufacturer prohibitions and must comply with either: (a) Manufacturer procedures applicable to assembly and disassembly; or (b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer

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requirements in Sec. 1926.1406.	can demonstrate that the procedures used meet the requirements in § 1926.1406. NOTE: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. (See § 1926.1404(r).)	can demonstrate that the procedures used meet the requirements in subsection (17) of this section. NOTE: The employer must follow manufacturer procedures when an employer uses slings during assembly or disassembly rigging. (See subsection (18) of this section)
Sec. 1926.1404 Assembly/Disassembly--general requirements (applies to all assembly and disassembly operations).	**§ 1926.1404 Assembly/Disassembly – general requirements (applies to all assembly and disassembly operations).**	
(a) Supervision--competent-qualified person. (1) Assembly/disassembly must be supervised by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons ("A/D supervisor"). (2) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this subpart, that person is considered the A/D supervisor.	(a) *Supervision – competent-qualified person*. (1) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons ("A/D director"). (2) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.	(2) Supervision--competent-qualified person. (a) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons ("assembly/disassembly director"). (b) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this part, that person is considered the assembly/disassembly director.
(b) Knowledge of procedures. The A/D supervisor must understand the applicable assembly/disassembly procedures.	(b) *Knowledge of procedures*. The A/D director must understand the applicable assembly/disassembly procedures.	(3) Knowledge of procedures. The assembly/disassembly director must understand the applicable assembly/disassembly procedures.
(c) Review of procedures. The A/D supervisor must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D supervisor has applied them to the same type and configuration of equipment (including accessories, if any) ~~so that they are already known and understood.~~	(c) *Review of procedures*. The A/D director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the A/D director ~~understands the procedures and~~ has applied them to the same type and configuration of equipment (including accessories, if any).	(4) Review of procedures. The assembly/disassembly director must review the applicable assembly/disassembly procedures immediately prior to the commencement of assembly/disassembly unless the assembly/disassembly director has applied them to the same type and configuration of equipment (including accessories, if any) so that they are already known and understood.
(d) Crew instructions. (1) Before commencing assembly/disassembly operations, the A/D supervisor must determine that the crew members	(d) *Crew instructions*. (1) Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members	(5) Crew instructions. (a) Before commencing assembly/disassembly operations, the assembly/disassembly director must ensure that the crew

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understand the following: (i) Their tasks. (ii) The hazards associated with their tasks. (iii) The hazardous positions/locations that they need to avoid. (2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in paragraphs (d)(1)(i) through (d)(1)(iii) of this section must be met ~~with respect to the crew member's understanding regarding that task.~~	understand all of the following: (i) Their tasks. (ii) The hazards associated with their tasks. (iii) The hazardous positions/locations that they need to avoid. (2) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in paragraphs (d)(1)(i) through (d)(1)(iii) of this section must be met.	members understand the following: (i) Their tasks. (ii) The hazards associated with their tasks. (iii) The hazardous positions/locations that they need to avoid. (b) During assembly/disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in subsection (5)(a)(i) through (5)(a)(iii) of this section must be met with respect to the crew member's understanding regarding that task.
(e) Protecting assembly/disassembly crew members out of operator view. (1) Before a crew member goes to a location that is out of view of the operator and is either: in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member shall inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by paragraph (e)(1) of this section, the operator shall not move any part of the equipment (or load) until the operator: (i) Gives a warning that is understood by the crew member as a signal that the equipment (or load) is about to be moved and allows time for the crew member to get to a safe position, or (ii) Is informed in accordance with a pre-arranged system of communication that the crew member is in a safe position.	(e) *Protecting assembly/disassembly crew members out of operator view*. (1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by paragraph (e)(1) of this section, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a prearranged system of communication that the crew member is in a safe position.	(6) Protecting assembly/disassembly crew members out of operator view. (a) Before a crew member goes to a location that is out of view of the operator and is either: in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that they are going to that location. (b) Where the operator knows that a crew member went to a location covered by subsection (6)(a) of this section, the operator must not move any part of the equipment (or load) until the operator: (i) Gives a warning that is understood by the crew member as a signal that the equipment (or load) is about to be moved and allows time for the crew member to get to a safe position, or (ii) Is informed in accordance with a pre-arranged system of communication that the crew member is in a safe position.
(f) Working under the boom, jib or other components. (1) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other	(f) *Working under the boom, jib or other components*. (1) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other	(7) Working under the boom, jib or other components. (a) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other

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components, except where the requirements of paragraph (f)(2) of this section are met. (2) Exception. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D supervisor must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See Non-mandatory Appendix D of this subpart for an example.)	components, except where the requirements of paragraph (f)(2) of this section are met. (2) *Exception*. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See Non-mandatory Appendix B of this subpart for an example.)	components, except where the requirements of subsection (7)(b) of this section are met. (b) Exception. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the assembly/disassembly director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See Non-mandatory Appendix D of this part for an example.)
(g) Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories shall not be exceeded for the equipment being assembled/disassembled.	(g) *Capacity limits*. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, must not be exceeded for the equipment being assembled/disassembled.	(8) Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories must not be exceeded for the equipment being assembled/disassembled.
(h) Addressing specific hazards. The A/D supervisor supervising the assembly/disassembly operation must address the hazards associated with the operation ~~with methods to protect the employees from them, as follows:~~ (1) Site and ground bearing conditions. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see Sec. 1926.1402 for ground condition requirements). (2) Blocking material. The size, amount, condition and method of stacking blocking must be sufficient to sustain the loads and maintain stability.	(h) *Addressing specific hazards*. The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include: (1) *Site and ground bearing conditions*. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see § 1926.1402 for ground condition requirements). (2) *Blocking material*. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability.	(9) Addressing specific hazards. The assembly/disassembly director supervising the assembly/disassembly operation must address the hazards associated with the operation with methods to protect the employees from them, as follows: (a) Site and ground bearing conditions. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see WAC 296-155-53400, subsection (34) through (38) for ground condition requirements). (b) Blocking material. The size, amount, condition and method of stacking blocking must be sufficient to sustain the loads and maintain stability.
(3) Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to:	(3) *Proper location of blocking*. When used to support lattice booms or components, blocking must be appropriately placed to:	(c) Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to:

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(i) Protect the structural integrity of the equipment, and (ii) Prevent dangerous movement and collapse.	(i) Protect the structural integrity of the equipment, and (ii) Prevent dangerous movement and collapse.	(i) Protect the structural integrity of the equipment, and (ii) Prevent dangerous movement and collapse.
(4) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with Sec. 1926.1417(o)(3) before assembly/disassembly begins ~~in order to prevent exceeding rated capacity limits for the assist crane.~~ (5) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components.	(4) *Verifying assist crane loads*. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with § 1926.1417(o)(3) before assembly/disassembly begins. (5) *Boom and jib pick points*. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components.	(d) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/disassembly must be verified in accordance with WAC 296-155-53400(63) before assembly/disassembly begins in order to prevent exceeding rated capacity limits for the assist crane. (e) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components.
(6) Center of gravity. (i) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. (ii) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used. (See Non-mandatory Appendix D of this subpart for an example.)	(6) *Center of gravity*. (i) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. (ii) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used. (See Non-mandatory Appendix B of this subpart for an example.)	(f) Center of gravity. (i) The center of gravity of the load must be identified if it is necessary for the method used for maintaining stability. (ii) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used. (See Non-mandatory Appendix D of this subpart for an example.)
(7) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), or components must be rigged or supported to maintain stability upon the removal of the pins.	(7) *Stability upon pin removal*. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components must be rigged or supported to maintain stability upon the removal of the pins.	(g) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components must be rigged or supported to maintain stability upon the removal of the pins.
(8) Snagging. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).	(8) *Snagging*. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).	(h) Snagging. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).
(9) Struck by counterweights. The potential for unexpected	(9) *Struck by counterweights*. The potential for unintended	(i) Struck by counterweights. The potential for unexpected

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movement from inadequately supported counterweights and from hoisting counterweights.	movement from inadequately supported counterweights and from hoisting counterweights.	movement from inadequately supported counterweights and from hoisting counterweights.
(10) Boom hoist brake failure. Where reliance is placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake shall be tested to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure shall be used.	(10) *Boom hoist brake failure*. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake must be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure must be used.	(j) Boom hoist brake failure. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly/disassembly, the brake must be tested prior to such reliance to determine if it is sufficient to prevent boom movement. If it is not sufficient, a boom hoist pawl, other locking device/back-up braking device, or another method of preventing dangerous movement of the boom (such as blocking or using an assist crane) from a boom hoist brake failure must be used.
(11) Loss of backward stability. Backward stability ~~must be considered~~ before swinging the upperworks, travel, and when attaching or removing equipment components. ~~See, for example, Figure 1.~~	(11) *Loss of backward stability*. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.	(k) Loss of backward stability. Backward stability must be considered before swinging the upperworks, travel, and when attaching or removing equipment components. See, for example, Figure 1.
Figure 1		
(12) Wind speed and weather. Wind speed and weather must be considered so that the safe assembly/disassembly of the equipment is not compromised.	(12) *Wind speed and weather*. The effect of wind speed and weather on the equipment.	(l) Wind speed and weather. The effect of wind speed and weather must be determined so that the safe assembly/disassembly of the crane/derrick is not compromised.
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering shall not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved shall determine this limitation in writing, which shall not be exceeded.	(j) *Cantilevered boom sections*. Manufacturer limitations on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which must not be exceeded.	(10) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering must not be exceeded. Where these are unavailable, a registered professional engineer familiar with the type of crane/derrick involved must determine this limitation in writing, which must not be exceeded.
(k) Weight of components. The weight of the components must be readily available.	(k) *Weight of components*. The weight of each of the components must be readily available.	(11) Weight of components. The weight of each of the components must be readily available.
(l) [Reserved.]	(l) [*Reserved*.]	
(m) Components and configuration.	(m) *Components and configuration*.	(12) Components and configuration.

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(1) The selection of components and configuration of the equipment that affect the capacity or safe operation of the equipment must be in accordance with: (i) Manufacturer instructions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (ii) Approved modifications that meet the requirements of Sec. 1926.1434 (Equipment modifications). (2) Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (m)(1) of this section (see Sec. 1926.1412(c) for post-assembly inspection requirements).	(1) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment must be in accordance with: (i) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (ii) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications). (2) *Post-assembly inspection*. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (m)(1) of this section (see § 1926.1412(c) for post-assembly inspection requirements).	(a) The selection of components and configuration of the equipment that affect the capacity or safe operation of the equipment must be in accordance with: (i) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (ii) Approved modifications that meet the requirements of WAC 296-155-53400 (60) and (61) (Equipment modifications). (b) Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with subsection (12)(a) of this section and as follows: (i) Upon completion of assembly, the equipment must be inspected by a qualified person to assure that it is configured in accordance with manufacturer equipment criteria. For tower cranes, this inspection must be done by an accredited crane certifier.
~~(n) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.~~	(n) [*Reserved*.]	(13) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.
(o) Shipping pins. Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.	(o) *Shipping pins*. Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.	(14) Shipping pins. Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.
(p) Pile driving. Equipment used for pile driving shall not have a jib attached during pile driving operations.	(p) *Pile driving*. Equipment used for pile driving must not have a jib attached during pile driving operations.	(15) Pile driving. Equipment used for pile driving must not have a jib attached during pile driving operations.
(q) Outriggers. When the load to be handled and the operating radius require the use of outriggers, or at any time when outriggers are used, the following requirements shall be met:	(q) *Outriggers and Stabilizers*. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements must be met	**WAC 296-155-53402(18)** (18) *Outriggers and stabilizers*. When the load to be handled and the operating radius require the use of outriggers or stabilizers, or at any time when outriggers or

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(1) The outriggers shall be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart. (2) The outriggers shall be set to remove the equipment weight from the wheels, except for locomotive cranes (see paragraph (q)(6) of this section for use of outriggers on locomotive cranes). (3) When outrigger floats are used, they shall be attached to the outriggers. (4) Each outrigger shall be visible to the operator or to a signal person during extension and setting. (5) Outrigger blocking shall: (i) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section. (ii) Be placed only under the outrigger float/pad of the ~~outrigger~~ jack or, where the outrigger is designed without a jack, under the outer bearing surface of the extended outrigger beam. (6) For locomotive cranes, when using outriggers to handle loads, the manufacturer's procedures shall be followed. When lifting loads without using outriggers, the manufacturer's procedures shall be met regarding truck wedges or screws.	(except as otherwise indicated): (1) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart. (2) The outriggers must be set to remove the equipment weight from the wheels, except for locomotive cranes (see paragraph (q)(6) of this section for use of outriggers on locomotive cranes). This provision does not apply to stabilizers. (3) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers. (4) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting. (5) Outrigger and stabilizer blocking must: (i) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section. (ii) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam. (6) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures must be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures must be met regarding truck wedges or screws.	stabilizers are used, all of the following requirements must be met (except as otherwise indicated: (a) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart. (b) The outriggers must be set to remove the equipment weight from the wheels. (c) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used , they must be attached to the stabilizers. (d) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting. (e) Outrigger and stabilizer blocking must: (i) Meet the requirements in paragraphs (9)(b) and (9)(c) of this section. (ii) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam.
	(r) *Rigging*. In addition to following the requirements in 29 CFR 1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that: (1) The rigging work is done by a qualified rigger. (2) Synthetic slings are protected from: abrasive, sharp or	**WAC 296-155-53402** (19) Rigging. In addition to following the requirements in WAC 296-155-556, 296-155-558, 296-155-560 and 296-155-562 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that:

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	acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. NOTE: Requirements for the protection of wire rope slings are contained in 29 CFR 1926.251(c)(9). (3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.	(a) The rigging work is done by a qualified rigger. See WAC 296-155-53306. (b) Synthetic slings are protected from: abrasive, sharp or acute edges, and configurations that could cause a reduction of the sling's rated capacity, such as distortion or localized compression. See WAC 296-155-55815(6), 296-155-55820(6) and 296-155-55825(6). **Note:** Requirements for the protection of wire rope slings are contained in WAC 296-155-55805. (c) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.
Sec. 1926.1405 Disassembly--additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures).	**§ 1926.1405 Disassembly – additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures).**	
	Dismantling (including dismantling for changing the length of) booms and jibs.	
(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension. ~~See, for example, Figure 2.~~	(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.	**WAC 296-155-53402 Assembly/disassembly** (16) The following are additional requirements for dismantling of booms and jibs, including dismantling for changing the length of booms and jibs (applies to both the use of manufacturer procedures and employer procedures): (a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension. See, for example, Figure 2.
Figure 2. Pins (indicated by arrows) are not to be removed while pendants remain in tension.		
(b) None of the pins (top and bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension. ~~See, for example, Figures~~	(b) None of the pins (top or bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension.	(b) None of the pins (top and bottom) on boom sections located between the pendant attachment points and the crane/derrick body are to be removed (partly or completely) when the pendants are in tension. See, for example, Figures

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~~3 and 4.~~		3 and 4.
Figure 3. Pendant is in tension while connected to uppermost boom section, and no pins are to be removed.		
Figure 4. Pendant is in tension, and pins between pendant attachment point and crane body (indicated by arrows) are not to be removed. Note that, because the cantilevered portion of the boom is not supported, only the bottom pins ahead of the pendant may be removed. See Figure 6.		
(c) None of the pins (top and bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support). ~~See, for example, Figure 5.~~	(c) None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support).	(c) None of the pins (top and bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support). See, for example, Figure 5.
Figure 5. Uppermost boom section is resting on ground, and no pins between uppermost boom section and crane body are to be removed.		
(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported. ~~See, for example, Figures 6 and 7.~~	(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.	(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported. See, for example, Figures 6 and 7.
Figure 6. Cantilevered portion of boom is not supported, and top pins therefore are not to be removed. Bottom pins (circled) may be removed.		
Figure 7. Cantilevered portion of boom is supported, and top pins (circled) may therefore be removed.		
Sec. 1926.1406 Assembly/disassembly--employer procedures--general requirements.	**§ 1926.1406 Assembly/Disassembly – employer procedures – general requirements.**	
(a) When using employer procedures instead of manufacturer procedures for assembling or disassembling,	(a) When using employer procedures instead of manufacturer procedures for assembly/disassembly, the	(17) When using employer procedures instead of manufacturer procedures for assembling or disassembling,

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the employer shall ensure that the procedures ~~are designed to~~: (1) Prevent unintended dangerous movement, and ~~to~~ prevent collapse, of all parts of the equipment. (2) Provide adequate support and stability of all parts of the equipment ~~during the assembly/disassembly process~~. (3) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized.	employer must ensure that the procedures: (1) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment. (2) Provide adequate support and stability of all parts of the equipment. (3) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized.	the employer must ensure that the procedures are designed to: (a) Prevent unintended dangerous movement, and to prevent collapse, of any parts of the equipment. (b) Provide adequate support and stability of all parts of the equipment during the assembly/disassembly process. (c) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized.
(b) Qualified person. Employer procedures must be developed by a qualified person.	(b) *Qualified person*. Employer procedures must be developed by a qualified person.	(d) Qualified person. Employer procedures must be developed by a qualified person.
Sec. 1926.1407 Power line safety (up to 350 kV)--assembly and disassembly.	**§ 1926.1407 Power line safety (up to 350 kV) – assembly and disassembly.**	**WAC 296-155-53408 Power Line Safety**
(a) Before assembling or disassembling equipment, the employer must determine if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) ~~(see paragraphs (a)(1), (a)(2) and (a)(3) of this section),~~ as follows: (1) Option (1)--Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (2) Option (2)--20 foot clearance. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (3) Option (3)--Table A clearance.	(a) Before assembling or disassembling equipment, the employer must determine if any part of the equipment, load line, or load (including rigging and lifting accessories) could get, in the direction or area of assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (1) *Option (1) – Deenergize and ground*. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (2) *Option (2) – 20 foot clearance*. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (3) *Option (3) – Table A clearance*. (i) Determine the line's voltage and the minimum clearance	(1) Assembly and disassembly of crane/derrick. (a) Before assembling or disassembling crane/derrick, the employer must determine if any part of the crane/derrick, load line or load (including rigging and lifting accessories) could get, in the direction or area of assembly, closer than 20 feet of a power line that is up to 350 kV or closer than 50 feet of a power line that exceeds 350 kV during the assembly/disassembly process. If so, the employer must meet the requirements in option (1), option (2), or option (3), as follows: (i) *Option (1) – deenergize and ground.* Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (ii) *Option (2) – clearance.* Ensure that no part of the crane/derrick, load line or load (including rigging and lifting accessories), gets closer than 20 feet of a power line that is up to 350 kV or closer than 50 feet of a power line that exceeds 350 kV by implementing the measures specified in

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(i) Determine the line's voltage and the minimum clearance distance permitted under Table A (see Sec. 1926.1408). (ii) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum approach distance to the power line permitted under Table A (see Sec. 1926.1408). If so, then the employer must follow the requirements in paragraph (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	distance permitted under Table A (see § 1926.1408). (ii) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A (see § 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum clearance distance.	subsection (1)(b) of this section. (iii) *Option (3) – Table 4 clearance.* (A) Determine the line's voltage and the minimum approach distance permitted under Table 4 of this section. (B) Determine if any part of the crane/derrick, load line or load (including rigging and lifting accessories), could get closer than the minimum approach distance of the power line permitted under Table 4 of this section. If so, then the employer must follow the requirements in subsection (1)(b) of this section to ensure that no part of the crane/derrick, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2), or Option (3) ~~(see paragraphs (a)(2) or (a)(3) of this section),~~ the following requirements must be met: (1) Conduct a planning meeting with the Assembly/Disassembly supervisor (A/D supervisor), operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution. (2) If tag lines are used, they must be non-conductive. (3) At least one of the following additional measures must be in place: (i) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: a clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post	(b) *Preventing encroachment/electrocution*. Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements must be met: (1) Conduct a planning meeting with the Assembly/Disassembly director (A/D director), operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution. (2) If tag lines are used, they must be nonconductive. (3) At least one of the following additional measures must be in place. The measure selected from this list must be effective in preventing encroachment. The additional measures are: (i) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: a clearly visible line painted	(b) Preventing encroachment/electrocution. Where encroachment precautions are required under option (2), or option (3), all of the following requirements must be met: (i) Conduct a planning meeting with the assembly/disassembly director, operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/electrocution. (ii) If tag lines are used, they must be non-conductive. (iii) At least one of the following additional measures must be in place. The measure selected from this list must be effective in preventing encroachment. The additional measures are: (A) Use a dedicated spotter who is in continuous contact with the crane/derrick operator. The dedicated spotter must: (I) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include: a clearly visible line painted on the ground; a clearly visible line on stanchions; a set of clearly visible

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behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator, ~~in accordance with Sec. 1926.1420 (Radio, telephone, or other electronic transmission of signals).~~ (D) Give timely information to the operator so that the required clearance distance can be maintained. (ii) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment. (v) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	on the ground; a clearly visible line of stanchions; a set of clearly visible line-of sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained. (ii) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment. (v) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter.) (II) Be positioned to effectively gauge the clearance distance. (III) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator, in accordance with WAC 296-155-53406(13) (radio, telephone, or other electronic transmission of signals). (IV) Give timely information to the operator so that the required clearance distance can be maintained. (B) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (C) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (D) A device that automatically limits range of movement, set to prevent encroachment. (E) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.
(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.	(c) *Assembly/disassembly below power lines prohibited*. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.	(c) Assembly/disassembly below power lines is prohibited. No part of a crane/derrick, load line or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.
(d) Assembly/disassembly inside Table A clearance prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially	(d) *Assembly/disassembly inside Table A clearance prohibited*. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially	(d) Assembly/disassembly inside Table 4 clearance is prohibited. No part of a crane/derrick, load line or load (including rigging and lifting accessories), whether partially

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or fully assembled, is allowed closer than the minimum approach distance under Table A (see Sec. 1926.1408) to a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.	or fully assembled, is allowed closer than the minimum approach distance under Table A (see § 1926.1408) to a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.	or fully assembled, is allowed closer than the minimum approach distance under Table 4 of a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line.
(e) Voltage information. Where Option (3) ~~(see paragraph (a)(3)~~ of this section) is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(e) *Voltage information*. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(e) Voltage information. Where option (3) is used, the utility owner/operator of power lines must provide the requested voltage information within two working days of the employer's request.
(f) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	(f) *Power lines presumed energized*. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	(f) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.
(g) Posting of electrocution warnings. There must be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.	(g) *Posting of electrocution warnings*. There must be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.	(g) Posting of electrocution warnings. There must be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the crane/derrick.
Sec. 1926.1408 Power line safety (up to 350 kV)--equipment operations.	**§ 1926.1408 Power line safety (up to 350 kV) – equipment operations.**	
(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer must: (1) Identify the work zone by either: (i) ~~Defining a work zone by~~ demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibit the operator from operating the equipment past those boundaries, or (ii) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working	(a) *Hazard assessments and precautions inside the work zone*. Before beginning equipment operations, the employer must: (1) *Identify the work zone by either*: (i) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or (ii) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working	(2) Operation of crane/derrick. (a) Hazard assessments and precautions inside the work zone. Before beginning crane/derrick operations, the employer must: (i) Identify the work zone. (A) Define a work zone by demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the crane/derrick past those boundaries, or (B) Define the work zone as the area 360 degrees around the

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radius. (2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) ~~(see paragraph (a)(2)(i), (a)(2)(ii), and (a)(2)(iii)~~ of this section), as follows: (i) Option (1)--Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (ii) Option (2)--20 foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (iii) Option (3)--Table A clearance. (A) Determine the line's voltage and the minimum approach distance permitted under Table A (see Sec. 1926.1408). (B) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A (see Sec. 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	radius. (2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (i) *Option (1) – Deenergize and ground*. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (ii) *Option (2) – 20 foot clearance*. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (iii) *Option (3) – Table A clearance*. (A) Determine the line's voltage and the minimum approach distance permitted under Table A (see § 1926.1408). (B) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A (see § 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	crane/derrick, up to its maximum working radius. (ii) Determine if any part of the crane/derrick, load line or load (including rigging and lifting accessories), if operated up to its maximum working radius in the work zone, could get closer than 20 feet of a power line that is up to 350 kV or closer than 50 feet of a power line that exceeds 350 kV. If so, the employer must meet the requirements in option (1), option (2), or option (3) as follows: (A) *Option (1) – deenergize and ground.* Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (B) *Option (2) – 20 foot clearance.* Ensure that no part of the crane/derrick, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (2)(b) of this section. (C) *Option (3) – Table 4 clearance.* (I) Determine the line's voltage and the minimum approach distance permitted under Table 4 of this section. (II) Determine if any part of the crane/derrick, load line or load (including rigging and lifting accessories), while operating up to its maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table 4 of this section. If so, then the employer must follow the requirements in subsection (2)(b) of this section to ensure that no part of the crane/derrick, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) ~~(see paragraphs (a)(2)(ii) and (a)(2)(iii)~~ of this	(b) *Preventing encroachment/electrocution*. Where encroachment precautions are required under Option (2) or Option (3) of this section, all of the following requirements	(b) Preventing encroachment/electrocution. Where encroachment precautions are required under option (2), or option (3), all of the following requirements must be met:

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section), the following requirements must be met: (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution. (2) If tag lines are used, they must be non-conductive. (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) ~~(see paragraph (a)(2)(ii)~~ of this section)) or at the minimum approach distance under Table A (see Sec. 1926.1408) (if using Option (3) ~~(see paragraph (a)(2)(iii)~~ of this section)). (4) Implement at least one of the following measures: (i) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the	must be met: (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution. (2) If tag lines are used, they must be non-conductive. (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (see § 1926.1408) (if using Option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter must be used as described in § 1926.1408(b)(4)(ii) in addition to implementing one of the measures described in §§ 1926.1408(b)(4)(i), (iii), (iv) and (v). (4) Implement at least one of the following measures: (i) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: a clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance	(i) Conduct a planning meeting with the operator and the other workers who will be in the area of the crane/derrick or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/electrocution. (ii) If tag lines are used, they must be non-conductive. (iii) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from a power line that is up to 350 kV or 50 feet from a power line that exceeds 350 kV (if using option (2)) or at the minimum approach distance under Table 4 of this section (if using option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter must be used as described in subsection (2)(b)(iv)(B) in addition to implementing one of the measures described in subsection (2)(b)(i), (iii), (iv) and (v). (iv) Implement at least one of the following measures: (A) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (B) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: (I) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include: a clearly visible line painted on the ground; a clearly visible line on stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (II) Be positioned to effectively gauge the clearance distance.

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required clearance distance can be maintained. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment. (v) An insulating link/device installed at a point between the end of the load line (or below) and the load. (5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.	distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment. (v) An insulating link/device, as defined in § 1926.1401, installed at a point between the end of the load line (or below) and the load. (5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.	(III) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (IV) Give timely information to the operator so that the required clearance distance can be maintained. (C) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (D) A device that automatically limits range of movement, set to prevent encroachment. (E) An insulating link/device installed at a point between the end of the load line (or below) and the load. (v) The requirements of subsection (2)(b)(iv) of this section do not apply to work covered by chapter 296-45 WAC.
(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(c) *Voltage information*. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(c) Voltage information. Where option (3) is used, operators of power lines must provide the requested voltage information within two working days of the employer's request.
(d) Operations below power lines. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph (d)(2) of this section applies. (2) Exceptions. Paragraph (d)(1) of this section is inapplicable where the employer demonstrates that one of the following applies: (i) The work is covered by subpart V of this part. (ii) For equipment with non-extensible booms: The	(d) *Operations below power lines*. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph (d)(2) of this section applies. (2) *Exceptions*. Paragraph (d)(1) of this section is inapplicable where the employer demonstrates that one of the following applies: (i) The work is covered by subpart V of this part. (ii) For equipment with non-extensible booms: The	(d) Operations below power lines. (i) No part of the crane/derrick, load line or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in subsection (2)(d)(ii) of this section apply. (ii) Exceptions. Subsection (2)(d)(i) of this section is inapplicable where the employer demonstrates that one of the following applies: (A) The work is covered by chapter 296-45 WAC. (B) For cranes/derricks with non-extensible booms: The

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uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A (of this section) minimum clearance distance below the plane of the power line. (iii) For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A (of this section)minimum clearance distance below the plane of the power line. (iv) The employer demonstrates that compliance with paragraph (d)(1) of this section is infeasible and meets the requirements of Sec. 1926.1410.	uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line. (iii) For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line. (iv) The employer demonstrates that compliance with paragraph (d)(1) of this section is infeasible and meets the requirements of § 1926.1410.	uppermost part of the crane/derrick, with the boom at true vertical, would be more than 20 feet below the plane of a power line that is up to 350 kV, 50 feet below the plane of a power line that exceeds 350 kV or more than the Table 4 minimum clearance distance below the plane of the power line. (C) For cranes with articulating or extensible booms: The uppermost part of the crane, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of a power line that is up to 350 kV, 50 feet below the plane of a power line that exceeds 350 kV or more than the Table 4 minimum clearance distance below the plane of the power line. (D) The employer demonstrates that compliance with subsection (2)(d)(i) of this section is infeasible and meets the requirements of subsection (3) of this section.
(e) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	(e) *Power lines presumed energized*. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	(e) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.
(f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter shall be deenergized or the following precautions shall be taken ~~when necessary to dissipate induced voltages~~: (1) The equipment shall be provided with an electrical ground. (2) ~~Non-conductive rigging or an insulating link/device shall be used.~~	(f) When working near transmitter/communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter must be deenergized or the following precautions must be taken: (1) The equipment must be provided with an electrical ground. (2) If tag lines are used, they must be non-conductive.	(3) Prior to working near a transmitter/communication tower where an electrical charge can be induced in the crane/derrick or materials being handled, the transmitter must be deenergized or the following precautions must be taken: (a) The crane/derrick must be provided with an electrical ground directly to the crane/derrick frame; and (b) Ground jumper cables must be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews must be provided with nonconductive poles having

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		large alligator clips or other similar protection to attach the ground cable to the load. (c) Combustible and flammable materials must be removed from the immediate area prior to operations. (d) If tag lines are used, they must be non-conductive.
(g) Training. (1) Operators and crew assigned to work with the equipment shall be trained on the following: (i) The procedures to be followed in the event of electrical contact with a power line. Such training shall include: (A) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. (B) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. (C) The safest means of evacuating from equipment that may be energized. (D) The danger of the potentially energized zone around the equipment. (E) The need for crew in the area to avoid approaching or touching the equipment. (F) Safe clearance distance from power lines. (ii) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (iii) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is	(g) *Training*. (1) The employer must train each operator and crew member assigned to work with the equipment on all of the following: (i) The procedures to be followed in the event of electrical contact with a power line. Such training must include: (A) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. (B) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. (C) The safest means of evacuating from equipment that may be energized. (D) The danger of the potentially energized zone around the equipment (step potential). (E) The need for crew in the area to avoid approaching or touching the equipment and the load. (F) Safe clearance distance from power lines. (ii) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (iii) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power	(f) Training. (i) The employer must train each operator and crew member assigned to work with the crane/derrick on all the following: (A) The procedures to be followed in the event of electrical contact with a power line. Such training must include: (I) Information regarding the danger of electrocution from the operator simultaneously touching the crane/derrick and the ground. (II) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. (III) The safest means of evacuating from the crane/derrick that may be energized. (IV) The danger of the potentially energized zone around the crane/derrick (step potential). (V) The need for crew in the area to avoid approaching or touching the crane/derrick and the load. (VI) Safe clearance distance from power lines. (B) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized, and visibly grounded at the worksite. (C) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a power line is

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insulated. (iv) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used. (2) Employees working as dedicated spotters shall be trained to enable them to effectively perform their task, including training on the applicable requirements of this section.	transmission and distribution confirms that a line is insulated. (iv) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used. (v) The procedures to be followed to properly ground equipment and the limitations of grounding. (2) Employees working as dedicated spotters must be trained to enable them to effectively perform their task, including training on the applicable requirements of this section. (3) Training under this section must be administered in accordance with §1926.1430(g).	insulated. (D) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used. (E) The procedures to be followed to properly ground equipment and the limitations of grounding. (ii) Employees working as dedicated spotters must be trained to enable them to effectively perform their task, including training on the applicable requirements of this section. (iii) Training under this section must be administered in accordance with WAC 296-155-53409(2).
(h) Devices originally designed by the manufacturer for use as: a safety device (see Sec. 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, shall meet the manufacturer's procedures for use and conditions of use.	(h) Devices originally designed by the manufacturer for use as: a safety device (see § 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the manufacturer's procedures for use and conditions of use.	(g) Devices originally designed by the manufacturer for use as: a safety device (see WAC 296-155-53410), operational aid (see WAC 296-155-53412), or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the manufacturer's procedures for use and conditions of use.
Table A--Minimum Clearance Distances Voltage (nominal, kV, alternating current) Minimum clearance distance (feet) up to 50..... 10 over 50 to 200..... 15 over 200 to 350..... 20 over 350 to 500..... 25 over 500 to 750..... 35 over 750 to 1,000..... 45 over 1,000..... (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).	**Table A – Minimum Clearance Distances** Voltage (nominal, kV, alternating current) Minimum clearance distance (feet) up to 50 10 over 50 to 200 15 over 200 to 350 20 over 350 to 500 25 over 500 to 750 35 over 750 to 1,000 45 over 1,000 (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) Note: The value that follows "to" is up to and includes that	**Table 4--Minimum Clearance Distances** ---------- Voltage (nominal, kV, alternating current) Minimum clearance distance (feet) ---------- up to 50..... 10 over 50 to 200..... 15 over 200 to 350..... 20 over 350 to 500..... 25 over 500 to 750..... 35 over 750 to 1,000..... 45 over 1,000..... (as established by the utility owner/operator or registered professional engineer who is a

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Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.	value. For example, over 50 to 200 means up to and including 200kV.	qualified person with respect to electrical power transmission and distribution). ---------- Note: The value that follows "to" is up to and includes that value.
Sec. 1926.1409 Power line safety (over 350 kV).	**§ 1926.1409 Power line safety (over 350 kV).**	
The requirements of Sec. 1926.1407 and Sec. 1926.1408 apply to power lines over 350 kV, except that wherever the distance "20 feet" is specified, the distance "50 feet" shall apply in its place.	The requirements of § 1926.1407 and § 1926.1408 apply to power lines over 350 kV except: (a) For power lines at or below 1000 kV, wherever the distance "20 feet" is specified, the distance "50 feet" must be substituted; and (b) For power lines over 1000 kV, the minimum clearance distance must be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.	WAC 296-155-53408 (6) The requirements of subsection (1) and (2) of this section apply to power lines over 350 kV, and below 1000 kV except that wherever the distance "20 feet" is specified, the distance "50 feet" must be substituted. (7) For power lines over 1000 kV, the minimum clearance distance must be established by the utility owner/operator or a registered professional engineer who is a qualified person with respect to power transmission and distribution.
Sec. 1926.1410 Power line safety (all voltages)--equipment operations closer than the Table A zone.	**§ 1926.1410 Power line safety (all voltages) – equipment operations closer than the Table A zone.**	
Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of Sec. 1926.1408 to an energized power line is prohibited, except where the employer demonstrates that the following requirements are met:	Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of § 1926.1408 to an energized power line is prohibited, except where the employer demonstrates that all of the following requirements are met:	(4) Operation of the crane/derrick inside the Table 4 zone. Operations in which any part of the crane/derrick, load line or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table 4 of an energized power line is prohibited, except where the employer demonstrates that all the following requirements are met:
(a) The employer determines that it is infeasible to do the work without breaching the minimum approach distance under Table A of Sec. 1926.1408.	(a) The employer determines that it is infeasible to do the work without breaching the minimum approach distance under Table A of § 1926.1408.	(a)The employer determines that it is infeasible to do the work without breaching the minimum approach distance under Table 4 of this section.
(b) The employer determines that, after consultation with the utility owner/operator, it is infeasible to deenergize and ground the power line or relocate the power line.	(b) The employer determines that, after consultation with the utility owner/operator, it is infeasible to deenergize and ground the power line or relocate the power line.	(b) The employer determines that, after consultation with the utility owner/operator, it is infeasible to deenergize and ground the power line or relocate the power line.
(c) Minimum clearance distance.	(c) *Minimum clearance distance*.	(c) Minimum clearance distance.

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(1) The power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution determines the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this determination include, but are not limited to: conditions affecting atmospheric conductivity; time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions, and other conditions affecting the ability to prevent electrical contact. (2) Paragraph (c)(1) of this section does not apply to work covered by subpart V of this part; instead, for such work, the minimum clearance distances specified in Sec. 1926.950 Table V-1 apply. Employers engaged in subpart V of this part work are permitted to work closer than the distances in Sec. 1926.950 Table V-1 where both the requirements of this section and Sec. 1926.952(c)(2)(iii) or (iv) are met.	(1) The power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution determines the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this determination include, but are not limited to: conditions affecting atmospheric conductivity; time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions, and other conditions affecting the ability to prevent electrical contact. (2) Paragraph (c)(1) of this section does not apply to work covered by subpart V of this part; instead, for such work, the minimum clearance distances specified in § 1926.950 Table V-1 apply. Employers engaged in subpart V work are permitted to work closer than the distances in § 1926.950 Table V-1 where both the requirements of this section and § 1926.952(c)(3)(i) or (ii) are met.	(i) The power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution determines the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this determination include: conditions affecting atmospheric conductivity; time necessary to bring the crane/derrick, load line and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions, and other conditions affecting the ability to prevent electrical contact. (ii) Subsection (3)(a)(iii)(A) of this section does not apply to work covered by chapter 296-45 WAC; instead, for such work, the minimum clearance distances specified in chapter 296-45 WAC, Table 1 apply. Employers covered by chapter 296-45 WAC are permitted to work closer than the distances in chapter 296-45 WAC, Table 1, where both the requirements of this rule and WAC 296-45-375(10) are met.
(d) A planning meeting with the employer and utility owner/operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) is held to determine the procedures that will be followed to prevent electrical contact and electrocution. At a minimum these procedures shall include: (1) If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line contact, the automatic reclosing feature of the circuit interrupting device must be made inoperative before work begins.	(d) A planning meeting with the employer and utility owner/operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) is held to determine the procedures that will be followed to prevent electrical contact and electrocution. At a minimum these procedures must include: (1) If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line contact, before the work begins, the automatic reclosing feature of the circuit interrupting device must be made inoperative if the design of the device permits.	(d) A planning meeting with the employer and power line operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) is held to determine the procedures that will be followed to prevent electrical contact and electrocution. At a minimum these procedures must include: (i) If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line contact, before the work begins, the automatic reclosing feature of the circuit interrupting device must be made inoperative if the design of the device permits.

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(2) A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must: (i) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (ii) Be positioned to effectively gauge the clearance distance. (iii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iv) Give timely information to the operator so that the required clearance distance can be maintained. (3) An elevated warning line, or barricade (not attached to the crane), in view of the operator (either directly or through video equipment), equipped with flags or similar high-visibility markings, to prevent electrical contact. However, this provision does not apply to work covered by subpart V of this part. (4) Insulating link/device. (i) An insulating link/device installed at a point between the end of the load line (or below) and the load. (ii) For work covered by subpart V of this part, the requirement in paragraph (d)(4)(i) of this section applies only when working inside the Sec. 1926.950 Table V-1 clearance distances.	(2) A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must: (i) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: a line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (ii) Be positioned to effectively gauge the clearance distance. (iii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iv) Give timely information to the operator so that the required clearance distance can be maintained. (3) An elevated warning line, or barricade (not attached to the crane), in view of the operator (either directly or through video equipment), equipped with flags or similar high-visibility markings, to prevent electrical contact. However, this provision does not apply to work covered by subpart V of this part. (4) *Insulating link/device*. (i) An insulating link/device installed at a point between the end of the load line (or below) and the load. (ii) For work covered by subpart V of this part, the requirement in paragraph (d)(4)(i) of this section applies only when working inside the § 1926.950 Table V-1 clearance distances. (iii) For work covered by subpart V of this part involving operations where use of an insulating link/device is infeasible, the requirements of § 1910.269(p)(4)(iii)(B) or (C) may be substituted for the requirement in (d)(4)(i) of	(ii) A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include: a clearly visible line painted on the ground; a clearly visible line on stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained. (iii) An elevated warning line, or barricade (not attached to the crane), in view of the operator (either directly or through video equipment), equipped with flags or similar high-visibility markings, to prevent electrical contact. However, this provision does not apply to work covered by chapter 296-45 WAC. (iv) Insulating link/device. (A) An insulating link/device installed at a point between the end of the load line (or below) and the load. (B) For work covered by chapter 296-45 WAC, the requirement in subsection (3)(a)(iv)(D)(I) of this section applies only when working inside the clearance distances of Table 1 in chapter 296-45 WAC. (C) For work covered by Chapter 296-45 WAC, Electrical Workers, involving operations where use of an insulating link/device is infeasible, the requirements of WAC 296-45-375 (10)(c)(ii) or (iii) may be substituted for the requirement

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	this section. (iv) Until [INSERT DATE 1 YEAR AND 90 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], the following procedure may be substituted for the requirement in paragraph (d)(4)(i) of this section: all employees, excluding equipment operators located on the equipment, who may come in contact with the equipment, the load line, or the load must be insulated or guarded from the equipment, the load line, and the load. Insulating gloves rated for the voltage involved are adequate insulation for the purposes of this paragraph. (v) Until [INSERT DATE 3 YEARS AND 90 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], the following procedure may be substituted for the requirement in (d)(4)(i) of this section: (A) The employer must use a link/device manufactured on or before [INSERT DATE 1 YEAR AND 90 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], that meets the definition of an insulating link/device, except that it has not been approved by a Nationally Recognized Testing Laboratory, and that is maintained and used in accordance with manufacturer requirements and recommendations, and is installed at a point between the end of the load line (or below) and the load; and (B) All employees, excluding equipment operators located on the equipment, who may come in contact with the equipment, the load line, or the load must be insulated or guarded from the equipment, the load line, and the load through an additional means other than the device described in paragraph (d)(4)(v)(A) of this section. Insulating gloves rated for the voltage involved are adequate additional means of protection for the purposes of this paragraph.	in (3)(d)(iv) of this section. (v) Until one year after the effective date of this part, the following procedure may be substituted for the requirement in paragraph (3)(d)(iv) of this section: all employees, excluding equipment operators located on the equipment, who may come in contact with the equipment, the load line, or the load must be insulated or guarded from the equipment, the load line, and the load. Insulating gloves rated for the voltage involved are adequate insulation for the purposes of this paragraph. (vi) Until three years after the effective date of this part the following procedure may be substituted for the requirement in (3)(d)(iv) of this section: (A) The employer must use a link/device manufactured on or before one year after the effective date of this part that meets the definition of an insulating link/device, except that it has not been approved by a Nationally Recognized Testing Laboratory, and that is maintained and used in accordance with manufacturer requirements and recommendations, and is installed at a point between the end of the load line (or below) and the load; and (B) All employees, excluding equipment operators located on the equipment, who may come in contact with the equipment, the load line, or the load must be insulated or guarded from the equipment, the load line, and the load through an additional means other than the device described in paragraph (3)(d)(v)(A) of this section. Insulating gloves rated for the voltage involved are adequate additional means of protection for the purposes of this paragraph. (vii) Use non-conductive rigging if the rigging may be within the Table 4 distance during the operation. (viii) If the crane/derrick is equipped with a device that

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(5) Non-conductive rigging if the rigging may be within the Table A (of Sec. 1926.1408) distance during the operation. (6) If the equipment is equipped with a device that automatically limits range of movement, it must be used and set to prevent any part of the equipment, load line, or load (including rigging and lifting accessories) from breaching the minimum approach distance established under paragraph (c) of this section. (7) If a tag line is used, it must be of the non-conductive type. (8) Barricades forming a perimeter at least 10 feet away from the equipment to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade shall be as far from the equipment as feasible. (9) Workers other than the operator must be prohibited from touching the load line above the insulating link/device and crane. (10) Only personnel essential to the operation ~~shall be~~ permitted to be in the area of the crane and load. (11) The equipment must be properly grounded. (12) Insulating line hose or cover-up shall be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.	(5) Nonconductive rigging if the rigging may be within the Table A of §1926.1408 distance during the operation. (6) If the equipment is equipped with a device that automatically limits range of movement, it must be used and set to prevent any part of the equipment, load line, or load (including rigging and lifting accessories) from breaching the minimum approach distance established under paragraph (c) of this section. (7) If a tag line is used, it must be of the nonconductive type. (8) Barricades forming a perimeter at least 10 feet away from the equipment to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade must be as far from the equipment as feasible. (9) Workers other than the operator must be prohibited from touching the load line above the insulating link/device and crane. Operators remotely operating the equipment from the ground must use either wireless controls that isolate the operator from the equipment or insulating mats that insulate the operator from the ground. (10) Only personnel essential to the operation are permitted to be in the area of the crane and load. (11) The equipment must be properly grounded. (12) Insulating line hose or cover-up must be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.	automatically limits range of movement, it must be used and set to prevent any part of the crane/derrick, load line or load (including rigging and lifting accessories) from breaching the minimum approach distance established under subsection (3)(a)(iii) of this section. (ix) If a tag line is used, it must be of the non-conductive type. (x) Barricades forming a perimeter at least 10 feet away from the crane/derrick to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade must be as far from the crane/derrick as feasible. (xi) Workers other than the operator must be prohibited from touching the load line above the insulating link/device and crane. Operators remotely operating the equipment from the ground must use either wireless controls that isolate the operator from the equipment or insulating mats that insulate the operator from the ground. (xii) Only personnel essential to the operation are permitted to be in the area of the crane and load. (xiii) The crane/derrick must be properly grounded. (xiv) Insulating line hose or cover-up must be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.
(e) The procedures developed to comply with paragraph (d) of this section are documented and immediately available on-site.	(e) The procedures developed to comply with paragraph (d) of this section are documented and immediately available on-site.	(e) The procedures developed to comply with subsection (3)(a)(iv) of this section are documented and immediately available on-site.
(f) The equipment user and utility owner/operator meet with the equipment operator and the other workers who will be in	(f) The equipment user and utility owner/operator (or registered professional engineer) meet with the equipment	(f) The crane/derrick user and utility owner/operator (or registered professional engineer) meet with the operator and

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the area of the equipment or load to review the procedures that will be implemented to prevent breaching the minimum approach distance established in paragraph (c) of this section and prevent electrocution.	operator and the other workers who will be in the area of the equipment or load to review the procedures that will be implemented to prevent breaching the minimum approach distance established in paragraph (c) of this section and prevent electrocution.	the other workers who will be in the area of the crane/derrick or load to review the procedures that will be implemented to prevent breaching the minimum approach distance established in subsection (3)(a)(iii) of this section and prevent electrocution.
(g) The procedures developed to comply with paragraph (d) of this section are implemented.	(g) The procedures developed to comply with paragraph (d) of this section are implemented.	(g) The procedures developed to comply with subsection (3)(a)(iv) of this section are implemented.
(h) The utility owner/operator and all employers of employees involved in the work shall identify one person who will direct the implementation of the procedures. The person identified in accordance with this paragraph shall direct the implementation of the procedures and shall have the authority to stop work at any time to ensure safety.	(h) The utility owner/operator (or registered professional engineer) and all employers of employees involved in the work must identify one person who will direct the implementation of the procedures. The person identified in accordance with this paragraph must direct the implementation of the procedures and must have the authority to stop work at any time to ensure safety.	(h) The utility owner/operator (or registered professional engineer) and all employers of employees involved in the work must identify one person who will direct the implementation of the procedures. The person identified in accordance with this paragraph must direct the implementation of the procedures and must have the authority to stop work at any time to ensure safety.
(i) [Reserved.]	(i) [*Reserved*.]	
(j) If a problem occurs implementing the procedures being used to comply with paragraph (d) of this section, or indicating that those procedures are inadequate to prevent electrocution, the employer shall safely stop operations and either develop new procedures to comply with paragraph (d) of this section or have the utility owner/operator deenergize and visibly ground or relocate the power line before resuming work.	(j) If a problem occurs implementing the procedures being used to comply with paragraph (d) of this section, or indicating that those procedures are inadequate to prevent electrocution, the employer must safely stop operations and either develop new procedures to comply with paragraph (d) of this section or have the utility owner/operator deenergize and visibly ground or relocate the power line before resuming work.	(i) If a problem occurs implementing the procedures being used to comply with subsection (3)(a)(iv) of this section, or indicating that those procedures are inadequate to prevent electrocution, the employer must safely stop operations and either develop new procedures to comply with subsection (3)(a)(iv) of this section or have the utility owner/operator deenergize and visibly ground or relocate the power line before resuming work.
(k) Devices originally designed by the manufacturer for use as: A safety device (see Sec. 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, shall meet the manufacturer's procedures for use and conditions of use.	(k) Devices originally designed by the manufacturer for use as a safety device (see § 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must comply with the manufacturer's procedures for use and conditions of use.	(j) Devices originally designed by the manufacturer for use as: safety devices (see WAC 296-155-53410), operational aids (see WAC 296-155-53412), or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the manufacturer's procedures for use and conditions of use.
	(l) [*Reserved*.]	
	(m) The employer must train each operator and crew member assigned to work with the equipment in accordance	(k) The employer must train each operator and crew member assigned to work with the equipment in accordance

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	with § 1926.1408(g).	with subsection (2)(f) of this section.
Sec. 1926.1411 Power line safety--while traveling.	**§ 1926.1411 Power line safety – while traveling under or near power lines with no load.**	
(a) This section establishes procedures and criteria that must be met for equipment traveling under a power line on the construction site with no load.	(a) This section establishes procedures and criteria that must be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by §§ 1926.1408, 1926.1409 or 1926.1410, whichever is appropriate, and § 1926.1417(u).	(4) Cranes while traveling. (a) This section establishes procedures and criteria that must be met for cranes traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by subsection (2), (4), (6) and (7) of this section, whichever is appropriate, and WAC 296-155-53400(35).
(b) The employer shall ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer shall ensure that a dedicated spotter who is in continuous contact with the operator is used. The dedicated spotter must: (i) Be positioned to effectively gauge the clearance distance. (ii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iii) Give timely information to the operator so that the required clearance distance can be maintained. (5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility,	(b) The employer must ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) *Dedicated spotter*. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer must ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter must: (i) Be positioned to effectively gauge the clearance distance. (ii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iii) Give timely information to the operator so that the required clearance distance can be maintained. (5) *Additional precautions for traveling in poor visibility*. When traveling at night, or in conditions of poor visibility,	(b) The employer must ensure that: (i) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this section. (ii) The clearances specified in Table 5 of this section are maintained. (iii) The effects of speed and terrain on crane movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table 5 of this section to be breached. (iv) Dedicated spotter. If any part of the crane while traveling will get closer than 20 feet of the power line, the employer must ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter must: (A) Be positioned to effectively gauge the clearance distance. (B) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (C) Give timely information to the operator so that the required clearance distance can be maintained. (v) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility,

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in addition to the measures specified in paragraphs (b)(1) through (4) of this section, the employer shall ensure that: (i) The power lines are illuminated or another means of identifying the location of the lines ~~shall be~~ used. (ii) A safe path of travel is identified and used.	in addition to the measures specified in paragraphs (b)(1) through (4) of this section, the employer must ensure that: (i) The power lines are illuminated or another means of identifying the location of the lines is used. (ii) A safe path of travel is identified and used.	in addition to the measures specified in subsection (4)(b)(i) through (4)(b)(iv) of this section, the employer must ensure that: (A) The power lines are illuminated or another means of identifying the location of the lines must be used. (B) A safe path of travel is identified and used.
		(5) The requirements of subsection (1) and (2) of this section apply to power lines over 350 kV, except that wherever the distance "20 feet" is specified, the distance "50 feet" must be substituted.
Table T--Minimum Clearance Distances While Traveling With No Load and Boom/Mast Lowered Voltage (nominal, kV, alternating current) While traveling--minimum clearance distance (feet) up to 0.75..... 4 (while traveling/boom lowered). over .75 to 50..... 6 (while traveling/boom lowered). over 50 to 345..... 10 (while traveling/boom lowered). over 345 to 750..... 16 (while traveling/boom lowered). Over 750 to 1,000..... 20 (while traveling/boom lowered). Over 1,000..... (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)	**Table T – Minimum Clearance Distances While Traveling With No Load** Voltage (nominal, kV, alternating current) While Traveling – Minimum clearance distance (feet) up to 0.75 4 over .75 to 50 6 over 50 to 345 10 over 345 to 750 16 Over 750 to 1,000 20 Over 1,000 (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)	**Table 5--Minimum Clearance Distances While Traveling With No Load and** **Boom/Mast Lowered** ---------- Voltage (nominal, kV, alternating current) While traveling--minimum clearance distance (feet) ---------- up to 0.75..... 4 (while traveling/boom lowered). over .75 to 50..... 6 (while traveling/boom lowered). over 50 to 345..... 10 (while traveling/boom lowered). over 345 to 750..... 16 (while traveling/boom lowered). Over 750 to 1,000..... 20 (while traveling/boom lowered). Over 1,000..... (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)
Sec. 1926.1412 Inspections.	**§ 1926.1412 Inspections.**	**WAC 296-155-53405 Inspections**

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(a) Modified equipment. (1) Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operator aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) or capacity shall be inspected by a qualified person after such modifications/additions have been completed, prior to initial use. The inspection shall meet the following requirements: (i) The inspection shall assure that the modifications or additions have been done in accordance with the approval obtained pursuant to Sec. 1926.1434 (Equipment modifications). (ii) The inspection shall include functional testing. (2) Equipment shall not be used until an inspection under this paragraph demonstrates that the requirements of paragraph (a)(1)(i) of this section have been met.	(a) *Modified equipment*. (1) Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) or capacity must be inspected by a qualified person after such modifications/additions have been completed, prior to initial use. The inspection must meet all of the following requirements: (i) The inspection must assure that the modifications or additions have been done in accordance with the approval obtained pursuant to § 1926.1434 (Equipment modifications). (ii) The inspection must include functional testing of the equipment. (2) Equipment must not be used until an inspection under this paragraph demonstrates that the requirements of paragraph (a)(1)(i) of this section have been met.	(1) Cranes that have had modifications or additions which affect the safe operation of the crane (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) or capacity must be inspected by an accredited crane certifier after such modifications/additions have been completed, prior to initial use, see WAC 296-155-53214.
(b) Repaired/adjusted equipment. (1) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), shall be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use. The inspection shall meet the following requirements: (i) The qualified person shall determine if the repair/adjustment meets manufacturer equipment criteria	(b) *Repaired/adjusted equipment*. (1) Equipment that has had a repair or adjustment that relates to safe operation (such as: a repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use. The inspection must meet all of the following requirements: (i) The qualified person must determine if the repair/adjustment meets manufacturer equipment criteria	TALK WITH STAKEHOLDERS. REFERENCING A QUALIFIED PERSON AS A MINIMUM OR DO WE WANT TO INSIST ON AN ACCREDITED CERTIFIER AS WE DID WITH MODIFICATIONS. 8-17-10

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(where applicable and available). (ii) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person shall: (A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed, the employer shall ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer shall ensure that they are developed by an RPE. (B) Determine if the repair/adjustment meets the criteria developed in accordance with paragraph (b)(1)(ii)(A) of this section. (iii) The inspection shall include functional testing. (2) Equipment shall not be used until an inspection under this paragraph demonstrates that the repair/adjustment meets the requirements of paragraph (b)(1)(i) of this section (or, where applicable, (b)(1)(ii) of this section).	(where applicable and available). (ii) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person must: (A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed, the employer must ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (B) Determine if the repair/adjustment meets the criteria developed in accordance with paragraph (b)(1)(ii)(A) of this section. (iii) The inspection must include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment. (4) Equipment must not be used until an inspection under this paragraph demonstrates that the repair/adjustment meets the requirements of paragraph (b)(1)(i) of this section (or, where applicable, paragraph (b)(1)(ii) of this section).	
(c) Post-assembly. (1) Upon completion of assembly, the equipment shall be inspected by a qualified person to assure that it is configured in accordance with manufacturer equipment criteria. (2) Where manufacturer equipment criteria are unavailable, a qualified person shall: (i) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an RPE is not needed, the employer shall ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer shall ensure that they are developed by an RPE. (ii) Determine if the equipment meets the criteria developed	(c) *Post-assembly*. (1) Upon completion of assembly, the equipment must be inspected by a qualified person to assure that it is configured in accordance with manufacturer equipment criteria. (2) Where manufacturer equipment criteria are unavailable, a qualified person must: (i) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an RPE is not needed, the employer must ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (ii) Determine if the equipment meets the criteria developed	**WAC 296-155-53402 (12)(b)** (12) Components and configuration. (b) Post-assembly inspection. Upon completion of assembly, the crane/derrick must be inspected to ensure compliance with subsection (12)(a) of this section and as follows: (i) Upon completion of assembly, the crane/derrick must be inspected by a qualified person to assure that it is configured in accordance with manufacturer's criteria. For tower cranes, this inspection must be done by an accredited crane certifier. (ii) Where manufacturer's criteria is unavailable, a qualified person must determine if a registered professional engineer

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in accordance with paragraph (c)(2)(i) of this section. (3) Equipment shall not be used until an inspection under this paragraph demonstrates that the equipment is configured in accordance with the applicable criteria.	in accordance with paragraph (c)(2)(i) of this section. (3) Equipment must not be used until an inspection under this paragraph demonstrates that the equipment is configured in accordance with the applicable criteria.	(RPE) familiar with the type of crane/derrick involved is needed to develop criteria for the configuration. If an RPE is not needed, the employer must ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (c) Crane/derrick must not be used until an inspection demonstrates that it's configured in accordance with the applicable criteria.
(d) Each shift. (1) A competent person shall begin a visual inspection prior to each shift, which shall be completed before or during that shift. The inspection shall consist of observation for apparent deficiencies. Disassembly is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating disassembly is needed. Determinations made in conducting the inspection shall be reassessed in light of observations made during operation. At a minimum the inspection shall include the following: (i) Control mechanisms for maladjustments interfering with proper operation. (ii) Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter. (iii) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation. (iv) Hydraulic system for proper fluid level. (v) Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat. (vi) Wire rope reeving for compliance with the manufacturer's specifications.	(d) *Each shift*. (1) A competent person must begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift. The inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed. Determinations made in conducting the inspection must be reassessed in light of observations made during operation. At a minimum the inspection must include all of the following: (i) Control mechanisms for maladjustments interfering with proper operation. (ii) Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter. (iii) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation. (iv) Hydraulic system for proper fluid level. (v) Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat.	**WAC 296-155-53405** (2) A competent person must begin a visual inspection prior to each shift the crane will be used, which must be completed before or during that shift. The inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart crane components or booming down is needed. Determinations made in conducting the inspection must be reassessed in light of observations made during operation. At a minimum, the inspection must include all of the following: (a) Control mechanisms for maladjustments interfering with proper operation; (b) Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter; (c) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation; (d) Hydraulic system for proper fluid level; (e) Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat;

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(vii) Wire rope, in accordance with Sec. 1926.1413(a). (viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (ix) Tires (when in use) for proper inflation and condition. (x) Ground conditions around the equipment for proper support, including ground settling under and around outriggers and supporting foundations, ground water accumulation, or similar conditions. (xi) The equipment for level position, both shift and after each move and setup. (xii) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (xiii) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. (xiv) Safety devices and operational aids for proper operation. (2) If any deficiency in paragraphs (d)(1)(i) through (xiv) of this section (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination shall be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment shall be removed from service until it has been corrected. (3) If any deficiency in paragraph (d)(1)(xiv) of this section (safety devices/operational aids) is identified, the action specified in Sec. 1926.1415 and Sec. 1926.1416 shall be taken prior to using the equipment.	(vi) Wire rope reeving for compliance with the manufacturer's specifications. (vii) Wire rope, in accordance with § 1926.1413(a). (viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (ix) Tires (when in use) for proper inflation and condition. (x) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. This paragraph does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (xi) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup. (xii) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (xiii) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This paragraph does not apply to the inspection of rails, rail stops, rail clamps and supporting surfaces when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (xiv) Safety devices and operational aids for proper operation. (2) If any deficiency in paragraphs (d)(1)(i) through (xiii) of	(f) Wire rope reeving for compliance with the manufacturer's specifications; (g) Wire rope, in accordance with WAC 296-155-53404; (h) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation; (i) Tires (when in use) for proper inflation and condition; (j) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. This paragraph does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR, Part 213; (k) The crane for level position within the tolerances specified by the crane manufacturer's recommendations, both before each shift and after each move and setup. (l) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (m) Rails, rail stops, rail clamps and supporting surfaces when the crane has rail traveling. This paragraph does not apply to the inspection of rails, rail stops, rail clamps and supporting surfaces when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR, Part 213. (n) Safety devices and operational aids for proper operation. If any deficiency is identified, the actions specified in WAC 296-155-53410 and 296-155-53412 must be taken prior to using the crane.

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	this section (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment must be taken out of service until it has been corrected. See § 1926.1417. (3) If any deficiency in paragraph (d)(1)(xiv) of this section (safety devices/operational aids) is identified, the action specified in § 1926.1415 and § 1926.1416 must be taken prior to using the equipment.	(4) The crane must not be used until safety deficiencies identified during the frequent inspection have been corrected, and approved by a qualified person.
		(3) The employer must keep at least one record of the frequent inspection per month (see items listed in subsection (2) of this section. This inspection record must be kept for at least three months. This report must contain the following information: (a) The items checked and the results of the inspection; (b) The name and signature of the person who conducted the inspection and the date.
(e) Monthly. (1) Each month the equipment is in service it shall be inspected in accordance with paragraph (d) (each shift) of this section. (2) Equipment shall not be used until an inspection under this paragraph demonstrates that no corrective action under paragraphs (d)(2) and (3) of this section is required. (3) Documentation. (i) The following information shall be documented by the employer that conducts the inspection: (A) The items checked and the results of the inspection. (B) The name and signature of the person who conducted	(e) *Monthly*. (1) Each month the equipment is in service it must be inspected in accordance with paragraph (d) of this section (each shift). (2) Equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraphs (d)(2) and (3) of this section is required. (3) *Documentation*. (i) The following information must be documented and maintained by the employer that conducts the inspection: (A) The items checked and the results of the inspection. (B) The name and signature of the person who conducted	

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the inspection and the date. (ii) This document shall be retained for a minimum of three months.	the inspection and the date. (ii) This document must be retained for a minimum of three months.	
(f) Annual/comprehensive. (1) At least every 12 months the equipment shall be inspected by a qualified person in accordance with paragraph (d) (each shift) of this section except that the corrective action set forth in this paragraph (f), Annual/comprehensive, of this section shall apply. (2) In addition, at least every 12 months, the equipment shall be inspected by a qualified person for the following: (i) Equipment structure (including the boom and, if equipped, the jib): (A) Structural members: Deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose, failed or significantly corroded. (C) Welds for cracks. (ii) Sheaves and drums for cracks or significant wear. (iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear. (iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear. (v) Safety devices and operational aids for proper operation (including significant inaccuracies). (vi) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation. (vii) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch. (viii) Travel steering, brakes, and locking devices, for	(f) *Annual/comprehensive*. (1) At least every 12 months the equipment must be inspected by a qualified person in accordance with paragraph (d) of this section (each shift) except that the corrective action set forth in paragraphs (f)(4), (f)(5), and (f)(6) of this section must apply in place of the corrective action required by paragraphs (d)(2) and (d)(3) of this section. (2) In addition, at least every 12 months, the equipment must be inspected by a qualified person. Disassembly is required, as necessary, to complete the inspection. The equipment must be inspected for all of the following: (i) Equipment structure (including the boom and, if equipped, the jib): (A) Structural members: deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose, failed or significantly corroded. (C) Welds for cracks. (ii) Sheaves and drums for cracks or significant wear. (iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear. (iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear. (v) Safety devices and operational aids for proper operation (including significant inaccuracies). (vi) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper	(5) *Annual/comprehensive*. (a) At least every 12 months the crane must be inspected by a qualified person in accordance with subsection (2) of this section (each shift) except that the corrective action set forth in subsections (5)(d), (5)(e), and (5)(f) of this section must apply in place of the corrective action required by subsection (2) of this section. (b) In addition, at least every 12 months, the crane must be inspected by a qualified person. Disassembly is required, as necessary, to complete the inspection. The crane must be inspected for all of the following: (i) Crane structure (including the boom and, if equipped, the jib): (A) Structural members: deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose, failed or significantly corroded. (C) Welds for cracks. (ii) Sheaves and drums for cracks or significant wear. (iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear. (iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear. (v) Safety devices and operational aids for proper operation (including significant inaccuracies). (vi) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.

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proper operation. (ix) Tires for damage or excessive wear. (x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing. (xi) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks. (xii) Hydraulic and pneumatic valves, as follows: (A) Spools: sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed). (xiii) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks. (C) Cylinder rods for scores, nicks, or dents. (D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: loose or deformed. (xiv) Outrigger pads/floats for excessive wear or cracks.	operation. (vii) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch. (viii) Travel steering, brakes, and locking devices, for proper operation. (ix) Tires for damage or excessive wear. (x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing. (xi) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks. (xii) Hydraulic and pneumatic valves, as follows: (A) Spools: sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed). (xiii) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks.	(vii) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch. (viii) Travel steering, brakes, and locking devices, for proper operation. (ix) Tires for damage or excessive wear. (x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing. (xi) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks. (xii) Hydraulic and pneumatic valves, as follows: (A) Spools: sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed). (xiii) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks. (C) Cylinder rods for scores, nicks, or dents.

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(xv) Slider pads for excessive wear or cracks (xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations. (xvii) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: missing or unreadable. (xviii) Originally equipped operator seat: missing. (xix) Operator seat: unusable. (xx) Originally equipped steps, ladders, handrails, guards: missing. (xxi) Steps, ladders, handrails, guards: in unusable/unsafe condition. (3) This inspection shall include functional testing to determine that the equipment as configured in the inspection is functioning properly. (4) If any deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections. (5) If the qualified person determines that a deficiency is a safety hazard, the equipment shall be removed from service until it has been corrected. (6) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the monthly inspections. (7) Documentation of annual/comprehensive inspection. The following information shall be documented and maintained by the employer that conducts the inspection: (i) The items checked and the results of the inspection. (ii) The name and signature of the person who conducted	(C) Cylinder rods for scores, nicks, or dents. (D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: loose or deformed. (xiv) Outrigger or stabilizer pads/floats for excessive wear or cracks. (xv) Slider pads for excessive wear or cracks (xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations. (xvii) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: missing or unreadable. (xviii) Originally equipped operator seat (or equivalent): missing. (xix) Operator seat: unserviceable. (xx) Originally equipped steps, ladders, handrails, guards: missing. (xxi) Steps, ladders, handrails, guards: in unusable/unsafe condition. (3) This inspection must include functional testing to determine that the equipment as configured in the inspection is functioning properly. (4) If any deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections. (5) If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in § 1926.1416(d) or § 1926.1435(e). See § 1926.1417. (6) If the qualified person determines that, though not	(D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: loose or deformed. (xiv) Outrigger or stabilizer pads/floats for excessive wear or cracks. (xv) Slider pads for excessive wear or cracks (xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations. (xvii) Warning labels and decals originally supplied with the crane by the manufacturer or otherwise required under this standard: missing or unreadable. (xviii) Originally equipped operator seat (or equivalent): missing. (xix) Operator seat: unserviceable. (xx) Originally equipped steps, ladders, handrails, guards: missing. (xxi) Steps, ladders, handrails, guards: in unusable/unsafe condition. (c) This inspection must include functional testing to determine that the crane as configured in the inspection is functioning properly. (d) If any deficiency is identified, an immediate determination must be made by a qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored on a monthly basis. (e) If a qualified person determines that a deficiency is a safety hazard, the crane must be taken out of service until it has been corrected, evaluated, and approved by a qualified person, except when temporary alternative measures are implemented as allowed in WAC 296-155-53412 and for tower cranes see WAC 296-155-54100(62). (f) If a qualified person determines that, though not

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the inspection and the date. (iii) This document shall be retained for a minimum of 12 months.	presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections. (7) *Documentation of annual/comprehensive inspection*. The following information must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: (i) The items checked and the results of the inspection. (ii) The name and signature of the person who conducted the inspection and the date.	presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections. (g) Documentation of annual/comprehensive inspection. The following information must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: (i) The items checked and the results of the inspection. (ii) The name and signature of the person who conducted the inspection and the date.
(g) Severe service. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer shall stop using the equipment and a qualified person shall: (1) Inspect the equipment for structural damage. (2) In light of the use/conditions determine whether any items/conditions listed in paragraph (f) of this section need to be inspected; if so, the qualified person shall inspect those items/conditions. (3) If a deficiency is found, the employer shall follow the requirements in paragraphs (f)(4) through (6) of this section.	(g) *Severe service*. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer must stop using the equipment and a qualified person must: (1) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely. (2) In light of the use/conditions determine whether any items/conditions listed in paragraph (f) of this section need to be inspected; if so, the qualified person must inspect those items/conditions. (3) If a deficiency is found, the employer must follow the requirements in paragraphs (f)(4) through (6) of this section.	(6) Severe service. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer must stop using the crane and a qualified person must: (a) Inspect the crane for structural damage to determine if the crane can continue to be used safely. (b) In light of the use/conditions determine whether any items/conditions listed in paragraph (5) of this section need to be inspected; if so, the qualified person must inspect those items/conditions. (c) If a deficiency is found, the employer must follow the requirements in paragraphs (5)(d) through (f) of this section.
(h) Equipment not in regular use. Equipment that has been idle for 3 months or more shall be inspected by a qualified person in accordance with the requirements of paragraph (e) (Monthly) of this section before initial use.	(h) *Equipment not in regular use*. Equipment that has been idle for 3 months or more must be inspected by a qualified person in accordance with the requirements of paragraph (e) (Monthly) of this section before initial use.	(7) Cranes not in regular use. Cranes that have been idle for 3 months or more must be inspected by a qualified person in accordance with the requirements of subsection (2) of this section before initial use.
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety	(j) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety	(8) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety

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device or operator aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule than the requirements of this section shall be followed. ~~Additional documentation requirements by the manufacturer are not required.~~	device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section must be followed.	device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section must be followed.
	(k) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	(9) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.
Sec. 1926.1413 Wire rope--inspection.	**§ 1926.1413 Wire rope – inspection.**	**WAC 296-155-53404 Wire Rope.**
(a) Shift inspection. (1) A competent person shall begin a visual inspection prior to each shift, which shall be completed before or during that shift. The inspection shall consist of observation of wire ropes (running and standing) that are ~~reasonably~~ likely to be in use during the shift for apparent deficiencies, including those listed in paragraph (a)(2) of this section. Untwisting (opening) of wire rope or booming down is not required as part of this inspection.	(a) *Shift inspection*. (1) A competent person must begin a visual inspection prior to each shift the equipment is used, which must be completed before or during that shift. The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including those listed in paragraph (a)(2) of this section. Untwisting (opening) of wire rope or booming down is not required as part of this inspection.	(2) Inspection of wire ropes. (a) Shift inspection. (i) A competent person must complete a visual inspection prior to commencement of crane operations during each shift. The inspection must consist of observation of wire ropes (running and standing) that are reasonable likely to be in use during the shift for apparent deficiencies, including those listed in subsection (2)(a)(ii) of this section. Untwisting (opening) of wire rope or booming down is not required as part of this inspection.
(2) Apparent deficiencies.	(2) *Apparent deficiencies*.	
(i) Category I. Apparent deficiencies in this category include the following: (A) Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. (B) Significant corrosion. (C) Electric arc (from a source other than power lines) or heat damage. (D) Improperly applied end connections. (E) Significantly corroded, cracked, bent, or worn end	(i) *Category I*. Apparent deficiencies in this category include the following: (A) Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. (B) Significant corrosion. (C) Electric arc damage (from a source other than power lines) or heat damage. (D) Improperly applied end connections. (E) Significantly corroded, cracked, bent, or worn end	(A) Category I. Apparent deficiencies in this category include the following: (I) Distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. (II) Corrosion. (III) Electric arc damage (from a source other than power lines) or heat damage. (IV) Improperly applied end connections. (V) Corroded, cracked, bent, or worn end connections (such

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connections (such as from severe service).	connections (such as from severe service).	as from severe service).
(ii) Category II. Apparent deficiencies in this category are: (A) Visible broken wires, as follows: (1) In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope. (2) In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters. (3) In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection. (B) A diameter reduction of more than 5% from nominal diameter.	(ii) *Category II*. Apparent deficiencies in this category are: (A) Visible broken wires, as follows: *(1)* In running wire ropes: six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope. *(2)* In rotation resistant ropes: two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters. *(3)* In pendants or standing wire ropes: more than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection. (B) A diameter reduction of more than 5% from nominal diameter.	(B) Category II. Apparent deficiencies in this category are: (I) Visibly broken wires in running wire ropes: six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope; (II) Visibly broken wires in rotation resistant ropes: two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters; (III) Visibly broken wires in pendants or standing wire ropes: more than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire at an end connection; and (IV) A diameter reduction of more than five percent from nominal diameter.
(iii) Category III. Apparent deficiencies in this category include the following:	(iii) *Category III*. Apparent deficiencies in this category include the following:	(C) Category III. Apparent deficiencies in this category include the following:
(A) In rotation resistant wire rope, core protrusion or other distortion indicating core failure. (B) Electrical contact with a power line. (C) A broken strand.	(A) In rotation resistant wire rope, core protrusion or other distortion indicating core failure. (B) Prior electrical contact with a power line. (C) A broken strand.	(I) In rotation resistant wire rope, core protrusion or other distortion indicating core failure. (II) Prior electrical contact with a power line. (III) A broken strand.
(3) Critical review items. The competent person shall give particular attention to:	(3) *Critical review items*. The competent person must give particular attention to all of the following:	(ii) Critical review items. The competent person must give particular attention to all of the following:
(i) Rotation resistant wire rope in use.	(i) Rotation resistant wire rope in use.	(A) Rotation resistant wire rope in use.
(ii) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.	(ii) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.	(B) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.
(iii) Wire rope at flange points, crossover points and repetitive pickup points on drums.	(iii) Wire rope at flange points, crossover points and repetitive pickup points on drums.	(C) Wire rope at flange points, crossover points and repetitive pickup points on drums.
(iv) Wire rope adjacent to end connections.	(iv) Wire rope at or near terminal ends.	(D) Wire rope at or near terminal ends.
(v) Wire rope at and on equalizer sheaves.	(v) Wire rope in contact with saddles, equalizer sheaves or	(E) Wire rope in contact with saddles, equalizer sheaves or

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	other sheaves where rope travel is limited.	other sheaves where rope travel is limited.
(4) Removal from service.	(4) *Removal from service*.	(iii) Removal from service.
(i) If a deficiency in Category I (see paragraph (a)(2)(i) of this section) is identified, an immediate determination shall be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until:	(i) If a deficiency in Category I (see paragraph (a)(2)(i) of this section) is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until:	(A) If a deficiency in Category I is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until:
(A) The wire rope is replaced, or	(A) The wire rope is replaced (see § 1926.1417), or	(I) The wire rope is replaced, or
(B) If the deficiency ~~(other than power line contact)~~ is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited.	(B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	(II) If the deficiency is localized, the problem is corrected by removing the damaged section of the wire rope; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
(ii) If a deficiency in Category II (see paragraph (a)(2)(ii) of this section) is identified, the employer shall comply with Option A (see paragraph (a)(2)(ii) (A) of this section) or Option B (see paragraph (a)(2)(ii)(B) of this section), as follows:	(ii) If a deficiency in Category II (see paragraph (a)(2)(ii) of this section) is identified, operations involving use of the wire rope in question must be prohibited until:	(B) If a deficiency in Category II is identified, operations involving use of the wire rope in question must be prohibited until:
(A) Option A. Consider the deficiency to constitute a safety hazard where it meets the wire rope manufacturer's established criterion for removal from service or meets a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope. If the deficiency is considered a safety hazard, operations involving use of the wire rope in question shall be prohibited until the wire rope is replaced, or the damage is removed in accordance with all of the requirements and restrictions in paragraph (a)(4)(i)(B) of this section.	(A) The employer complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope (see § 1926.1417),	(I) The employer complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope,

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(B) Option B. Institute the alternative measures specified in paragraph (a)(4)(iii) of this section.	(B) The wire rope is replaced (see § 1926.1417), or	(II) The wire rope is replaced, or
(iii) Alternative measures for a Category II deficiency. The wire rope may continue to be used if the employer ensures that the following measures are implemented:	(C) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	(C) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
(A) A qualified person assesses the deficiency in light of the load and other conditions of use and determines it is safe to continue to use the wire rope as long as the conditions established under this paragraph are met.		
(B) A qualified person establishes the parameters for the use of the equipment with the deficiency, including a reduced maximum rated capacity.		
(C) A qualified person establishes a specific number of broken wires, or diameter reduction that, when reached, will require the equipment to be taken out of service until the wire rope is replaced, or the damage is removed in accordance with all of the requirements and restrictions in paragraph (a)(4)(i)(B) of this section.		
(D) A qualified person sets a time limit, not to exceed 30 days from the date the deficiency is first identified, by which the wire rope must be replaced, or the damage removed in accordance with all of the requirements and restrictions in paragraph (a)(4)(i)(B) of this section.		
(E) The workers who will conduct the shift inspections are informed of this deficiency and the measures taken under this paragraph.		
(F) The qualified person's findings and procedures in paragraphs (a)(4)(iii)(A) through (D) of this section are		

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documented.		
(iv) If a deficiency in Category III is identified, operations involving use of the wire rope in question shall be prohibited until:	(iii) If a deficiency in Category III is identified, operations involving use of the wire rope in question must be prohibited until:	(D) If a deficiency in category III is identified, operations involving use of the wire rope in question must be prohibited until:
(A) The wire rope is replaced, or	(A) The wire rope is replaced (see § 1926.1417), or	(I) The wire rope is replaced, or
(B) If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited.	(B) If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	(II) If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.
(v) Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope shall be tagged-out, in accordance with Sec. 1926.1417(f)(1), until the wire rope is repaired or replaced.	(iv) Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope must be tagged-out, in accordance with § 1926.1417(f)(1), until the wire rope is repaired or replaced.	(E) Where a wire rope is required to be removed from service under this section, either the crane/derrick (as a whole) or the hoist with that wire rope must be tagged-out, in accordance with WAC 296-155-53400(69), until the wire rope is repaired or replaced.
(b) Monthly inspection. (1) Each month an inspection shall be conducted in accordance with paragraph (a) (shift inspection) of this section. (2) Wire ropes on equipment shall not be used until an inspection under this paragraph demonstrates that no corrective action under paragraph (a)(4) of this section is required. (3) The inspection shall be documented according to Sec. 1926.1412(e)(3) (monthly inspection documentation).	(b) *Monthly inspection*. (1) Each month an inspection must be conducted in accordance with paragraph (a) (shift inspection) of this section. (2) The inspection must include any deficiencies that the qualified person who conducts the annual inspection determines under paragraph (c)(3)(ii) of this section must be monitored. (3) Wire ropes on equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraph (a)(4) of this section is required. (4) The inspection must be documented according to §	(b) Monthly inspection. (i) Each month an inspection must be conducted in accordance with subsection (2)(a) of this section (shift inspection). (2) The inspection must include any deficiencies that the qualified person who conducts the annual inspection determines under paragraph (2)(c)(iii) of this section must be monitored. (ii) Wire ropes on a crane/derrick must not be used until an inspection under this subsection demonstrates that no corrective action under subsection (2)(a)(iii) of this section is required. (iii) This inspection must be documented and be kept and

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	1926.1412(e)(3) (monthly inspection documentation).	made available upon request. Electronic records are acceptable.
(c) Annual/comprehensive. (1) At least every 12 months, wire ropes in use on equipment shall be inspected by a qualified person in accordance with paragraph (a) (shift inspection) of this section. (2) In addition, at least every 12 months, the wire ropes in use on equipment shall be inspected by a qualified person, as follows: (i) The inspection shall be for deficiencies of the types listed in paragraph (a)(2) of this section. (ii) The inspection shall be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to: (A) Critical review items listed in paragraph (a)(3) of this section. (B) Those sections that are normally hidden during shift and monthly inspections. ~~(C) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.~~ (D) Wire rope subject to reverse bends. (E) Wire rope passing over sheaves. (F) Wire rope at or near terminal ends. (iii) Exception: In the event an inspection under paragraph (c)(2) of this section is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections shall be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly.	(c) *Annual/comprehensive*. (1) At least every 12 months, wire ropes in use on equipment must be inspected by a qualified person in accordance with paragraph (a) of this section (shift inspection). (2) In addition, at least every 12 months, the wire ropes in use on equipment must be inspected by a qualified person, as follows: (i) The inspection must be for deficiencies of the types listed in paragraph (a)(2) of this section. (ii) The inspection must be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following: (A) Critical review items listed in paragraph (a)(3) of this section. (B) Those sections that are normally hidden during shift and monthly inspections. (C) Wire rope subject to reverse bends. (D) Wire rope passing over sheaves. (iii) *Exception*: In the event an inspection under paragraph (c)(2) of this section is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections must be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly. (3) If a deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard.	(c) Annual/comprehensive, for cranes and derricks not covered by WAC 296-155-529 through 296-155-53214. (i) At least every 12 months, wire ropes in use on the crane/derrick must be inspected by a qualified person in accordance with subsection (2)(a) of this section (shift inspection). (ii) In addition, at least every 12 months, the wire ropes in use on the crane/derrick must be inspected by a qualified person, as follows: (A) The inspection must be for deficiencies of the types listed in subsection (2)(a)(i)(B) of this section. (B) The inspection must be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following: (I) Critical review items listed in subsection (2)(a)(ii) of this section. (II) Those sections that are normally hidden during shift and monthly inspections. (III) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited. (IV) Wire rope subject to reverse bends. (V) Wire rope passing over sheaves. (VI) Wire rope at or near terminal ends. (C) Exception: In the event an inspection under subsection (2)(c)(ii) of this section is not feasible due to existing set-up and configuration of the crane/derrick (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections must be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the

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(3) If a deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. (i) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until: (A) The wire rope is replaced, or (B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. (ii) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the monthly inspections. (4) The inspection shall be documented according to Sec. 1926.1412(f)(7) (annual/comprehensive inspection documentation).	(i) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position. (ii) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections. (4) The inspection must be documented according to § 1926.1412(f)(7) (annual/comprehensive inspection documentation).	time of disassembly. (iii) If a deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard. (A) If the deficiency is determined to constitute a safety hazard, operations involving the use of the wire rope in question is prohibited until: (I) The wire rope is replaced, or (II) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this subsection, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position. (B) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections. (iv) This inspection must be documented and be kept and made available upon request. Electronic records are acceptable.
(d) Rope lubricants that are of the type that hinder inspection shall not be used.	(d) Rope lubricants that are of the type that hinder inspection must not be used.	(d) Rope lubricants that are of the type that hinder inspection must not be used.
	(e) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	(e) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.
Sec. 1926.1414 Wire rope--selection and installation criteria.	**§ 1926.1414 Wire rope – selection and installation criteria.**	(1) Selection and installation criteria.
(a) Selection of replacement wire rope shall be in accordance with the requirements of this section and the recommendations of the wire rope manufacturer, the	(a) Original equipment wire rope and replacement wire rope must be selected and installed in accordance with the requirements of this section. Selection of replacement wire	(a) Original crane/derrick wire rope and replacement wire must be selected and installed in accordance with the requirements of this section. Selection of replacement wire

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equipment manufacturer, or a qualified person.	rope must be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.	rope must be in accordance with the recommendations of the wire rope manufacturer, the crane/derrick manufacturer, or a qualified person.
	(b) *Wire rope design criteria*: Wire rope (other than rotation resistant rope) must comply with either Option (1) or Option (2) of this section, as follows: (1) *Option (1)*. Wire rope must comply with section 5-1.7.1 of ASME B30.5- 2004 (incorporated by reference, see § 1926.6) except that section's paragraph (c) must not apply. (2) *Option (2)*. Wire rope must be designed to have, in relation to the equipment's rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in § 1926.1413 will be an effective means of preventing sudden rope failure.	(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) must comply with either Option (1) or Option (2) of this section, as follows: (1) *Option (1)*. Wire rope must comply with section 5-1.7.1 of ASME B30.5- 2007 except that section's paragraph (c) must not apply. (2) Option (2). Wire rope must be designed to have, in relation to the cranes/derricks rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in this section will be an effective means of preventing sudden rope failure.
	(c) Wire rope must be compatible with the safe functioning of the equipment.	(c) Wire rope must be compatible with the safe functioning of the crane/derrick.
(b) Boom hoist reeving. (1) Fiber core ropes shall not be used for boom hoist reeving, except for derricks. (2) Rotation resistant ropes shall be used for boom hoist reeving only where the requirements of paragraph (c) of this section are met.	(d) *Boom hoist reeving*. (1) Fiber core ropes must not be used for boom hoist reeving, except for derricks. (2) Rotation resistant ropes must be used for boom hoist reeving only where the requirements of paragraph (e)(4)(ii) of this section are met.	(b) Boom hoist reeving. (i) Fiber core ropes must not be used for boom hoist or luffing attachment reeving, except for derricks. (ii) Rotation resistant ropes must be used for boom hoist reeving only where the requirements of subsection (1)(c) of this section are met.
(c) Rotation resistant ropes.	(e) *Rotation resistant ropes*.	(c) Rotation resistant ropes.
(1) Definitions. (i) Type I rotation resistant wire rope (" Type I"). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(1) *Definitions*. (i) *Type I rotation resistant wire rope (" Type I")*. Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(i) Definitions. (A) Type I rotation resistant wire rope ("Type I"). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.

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(ii) Type II rotation resistant wire rope ("Type II"). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer. (iii) Type III rotation resistant wire rope ("Type III"). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(ii) *Type II rotation resistant wire rope ("Type II")*. Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer. (iii) *Type III rotation resistant wire rope ("Type III")*. Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(B) Type II rotation resistant wire rope ("Type II"). Type II rotation resistant rope is stranded rope constructed to have resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer. (C) Type III rotation resistant wire rope ("Type III"). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.
(2) Requirements. (i) Types II and III with an operating design factor of less than 5 shall not be used for duty cycle or repetitive lifts. (ii) Rotation resistant ropes (including Types I, II and III) shall have an operating design factor of no less than 3.5. (iii) Type I shall have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing. (iv) Types II and III shall have an operating design factor of no less than 5, except where the requirements of paragraph (c)(3) of this section are met.	(2) *Requirements*. (i) Types II and III with an operating design factor of less than 5 must not be used for duty cycle or repetitive lifts. (ii) Rotation resistant ropes (including Types I, II and III) must have an operating design factor of no less than 3.5. (iii) Type I must have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing. (iv) Types II and III must have an operating design factor of no less than 5, except where the requirements of paragraph (e)(3) of this section are met.	(ii) Requirements. (A) Types II and III with an operation design factor of less than five must not be used for duty cycle or repetitive lifts. (B) Rotation resistant ropes (including Types I, II and III) must have an operating design factor of no less than 3.5. (C) Type I must have an operating design factor of no less than five, except where the wire rope manufacturer and the crane/derrick manufacturer approves the design factor, in writing. (D) Types II and III must have an operating design factor of no less than five, except where the requirements of subsection (1)(c)(iii) of this section are met.
(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements shall be met for each lifting operation: (i) A qualified person shall inspect the rope in accordance with Sec. 1926.1413(a). The rope shall be used only if the	(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements must be met for each lifting operation: (i) A qualified person must inspect the rope in accordance with § 1926.1413(a). The rope must be used only if the	(iii) When Types II and III with an operation design factor of less than five are used (for non-duty cycle, non-repetitive lifts), the following requirements must be met for each lifting operation: (A) A qualified person must inspect the rope in accordance with paragraph (2)(a) of this section. The rope must be used

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qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay shall be considered a hazard. (ii) Operations shall be conducted in such a manner and at such speeds as to minimize dynamic effects. (iii) Each lift made under these provisions shall be recorded in the monthly and annual inspection documents. Such prior uses shall be considered by the qualified person in determining whether to use the rope again.	qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay must be considered a hazard. (ii) Operations must be conducted in such a manner and at such speeds as to minimize dynamic effects. (iii) Each lift made under § 1926.1414(e)(3) must be recorded in the monthly and annual inspection documents. Such prior uses must be considered by the qualified person in determining whether to use the rope again.	only if the qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than one broken wire in any one rope lay must be considered a hazard. (B) Operations must be conducted in such a manner and at such speeds as to minimize dynamic effects. (C) Each lift made under these provisions must be recorded in the monthly and annual inspection documents. Such prior uses must be considered by the qualified person in determining whether to use the rope again.
(4) Additional requirements for rotation resistant ropes for boom hoist reeving. (i) Rotation resistant ropes shall not be used for boom hoist reeving, except where the requirements of paragraph (c)(4)(ii) of this section are met. (ii) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, the following requirements shall be met: (A) The drum shall provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (B) The requirements in Sec. 1926.1426(a) (irrespective of the date of manufacture of the equipment), and Sec. 1926.1426(b). (C) The requirements in ASME B30.5-2004, section 5-1.3.2 (a), (a)(2) through (a)(4), (b) and (d), except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used instead of the value of 16 specified in section 5-1.3.2(d). (D) All sheaves used in the boom hoist reeving system shall	(4) *Additional requirements for rotation resistant ropes for boom hoist reeving*. (i) Rotation resistant ropes must not be used for boom hoist reeving, except where the requirements of paragraph (e)(4)(ii) of this section are met. (ii) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements must be met: (A) The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (B) The requirements in § 1926.1426(a) (irrespective of the date of manufacture of the equipment), and § 1926.1426(b). (C) The requirements in ASME B30.5-2004 sections 5-1.3.2(a), (a)(2) through (a)(4), (b) and (d) (incorporated by reference, see § 1926.6) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5- 1.3.2(d)). (D) All sheaves used in the boom hoist reeving system must	(iv) Additional requirements for rotation resistant ropes for boom hoist reeving. (A) Rotation resistant ropes must not be used for boom hoist reeving, except where the requirements of subsection (1)(c)(iv)(B) of this section are met. (B) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements must be met: (I) The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (II) The requirements in WAC 296-155-53700(9) (irrespective of the date of manufacture of the crane/derrick), and WAC 296-155-53700(10). (III) The requirements of ANSI/ASME B30.5-2007, Section 5-1.3.2(a), (a)(2) through (a)(4), (b) and (d), except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used instead of the value of 16 specified in Section 5-1.3.2(d). (IV) All sheaves used in the boom hoist reeving system

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have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (E) The operating design factor for the boom hoist reeving system shall be not less than five. (F) The operating design factor for these ropes shall be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity. (G) When provided, a power-controlled lowering system shall be capable of handling rated capacities and speeds as specified by the manufacturer.	have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (E) The operating design factor for the boom hoist reeving system must be not less than five. (F) The operating design factor for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity. (G) When provided, a power-controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.	must have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (V) The operating design factor for the boom hoist reeving system must be not less than 5. (VI) The operating design factor for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the crane's/derrick's rated capacity. (VII) When provided, a power-controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.
(d) Wire rope clips used in conjunction with wedge sockets shall be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for dead-ending rope in a wedge socket is permitted.	(f) Wire rope clips used in conjunction with wedge sockets must be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for dead-ending rope in a wedge socket is permitted.	(d) Wire rope clips used in conjunction with wedge sockets must be attached to the unloaded dead end of the rope only, except that the use of devices specifically designed for dead-ending rope in a wedge socket is permitted.
(e) Socketing shall be done in the manner specified by the manufacturer of the wire rope or fitting.	(g) Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting.	(e) Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting.
(f) Prior to cutting a wire rope, seizings shall be placed on each side of the point to be cut. The length and number of seizings shall be in accordance with the wire rope manufacturer's instructions.	(h) Prior to cutting a wire rope, seizings must be placed on each side of the point to be cut. The length and number of seizings must be in accordance with the wire rope manufacturer's instructions.	(f) Prior to cutting a wire rope, seizings must be placed on each side of the point to be cut. The length and number of seizings must be in accordance with the wire rope manufacturer's instructions.
Sec. 1926.1415 Safety devices.	**§ 1926.1415 Safety devices.**	**WAC 296-155-53410 Safety Devices**
(a) Safety devices. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified: (1) Crane level indicator. (i) The equipment shall have a crane level indicator that is either built into the equipment or is available on the equipment. (ii) If a built-in crane level indicator is not working properly, it shall be tagged-out or removed.	(a) *Safety devices*. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified: (1) *Crane level indicator*. (i) The equipment must have a crane level indicator that is either built into the equipment or is available on the equipment. (ii) If a built-in crane level indicator is not working properly, it must be tagged-out or removed. If a removable	(1) Safety devices. The following safety devices are required on all cranes/derricks, except tower cranes, covered by this part, unless otherwise specified. For requirements relating to operational aids and safety devices for tower cranes, see WAC 296-155-53900(61) and (62). (a) Crane level indicator. (i) The crane must have a level indicator that is either built into the crane or is available on the crane. (ii) If a built-in crane level indicator is not working

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(iii) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation. (2) Boom stops, except for derricks and hydraulic booms. (3) Jib stops (if a jib is attached), except for derricks. (4) Equipment with foot pedal brakes shall have locks, ~~except for portal cranes and floating cranes~~. (5) Hydraulic outrigger jacks shall have an integral holding device/check valve. (6) Equipment on rails shall have rail clamps and rail stops, except for portal cranes.	crane level indicator is not working properly, it must be removed. (iii) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation. (2) Boom stops, except for derricks and hydraulic booms. (3) Jib stops (if a jib is attached), except for derricks. (4) Equipment with foot pedal brakes must have locks. (5) Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve. (6) Equipment on rails must have rail clamps and rail stops, except for portal cranes. (7) *Horn* (i) The equipment must have a horn that is either built into the equipment or is on the equipment and immediately available to the operator. (ii) If a built-in horn is not working properly, it must be tagged-out or removed. If a removable horn is not working properly, it must be removed.	properly, it must be tagged-out or removed. If a removable crane level indicator is not working properly, it must be removed. (iii) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation. (b) Boom stops, except for derricks and hydraulic booms. (c) Jib stops (if a jib is attached), except for derricks. (d) Cranes with foot pedal brakes must have locks, except for portal cranes and floating cranes. (e) Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve. (f) Cranes on rails must have rail clamps and rail stops, except for portal cranes. (g) Horn (i) The crane/derrick must have a built-in horn or a removable horn that is available to the operator.. (ii) If a built-in horn is not working properly, it must be tagged-out or removed. If a removable horn is not working properly, it must be removed.
(b) Proper operation required. Operations shall not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator shall safely stop operations. Operations shall not resume until the device is again working properly. Alternative measures are not permitted to be used.	(b) *Proper operation required*. Operations must not begin unless all of the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. If any of the devices listed in this section are not in proper working order, the equipment must be taken out of service and operations must not resume until the device is again working properly. See § 1926.1417 (Operation). Alternative measures are not permitted to be used.	(2) Proper operation required. Operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. If any of the devices listed in this section are not in proper working order, the equipment must be taken out of service and operations must not resume until the device is again working properly. Alternative measures are not permitted to be used for items listed in subsection (1) (b) through (g) of this section.
Sec. 1926.1416 Operational aids.	**§ 1926.1416 Operational aids.**	**WAC 296-155-53412 Operational Aids**
(a) The devices listed in this section ("listed operational	(a) The devices listed in this section ("listed operational	(1) The devices listed in this section ("listed operational

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aids") are required on all equipment covered by this subpart, unless otherwise specified.	aids") are required on all equipment covered by this subpart, unless otherwise specified. (1) The requirements in paragraphs (e)(1), (e)(2), and (e)(3) of this section do not apply to articulating cranes. (2) The requirements in paragraphs (d)(3), (e)(1), and (e)(4) of this section apply only to those digger derricks manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].	aids") are required on all crane/derrick, except tower cranes, covered by this part, unless otherwise specified. For requirements relating to operational aids and safety devices for tower cranes, see WAC 296-155-53900(61) and (62). Note: • The requirements in subsections (5)(a), (b) and (c) of this section do not apply to articulating cranes. • The requirements in subsections (4)(c), (5)(a) and (5)(d) of this section only apply to those digger derricks manufactured after the effective date of this section.
(b) Operations shall not begin unless the listed operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the crane/derrick manufacturer, if any, shall be followed.	(b) Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in paragraphs (d) and (e) of this section. More protective alternative measures specified by the crane/derrick manufacturer, if any, must be followed.	(2) Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in paragraphs (4) and (5) of this section. More protective alternative measures specified by the crane/derrick manufacturer, if any, must be followed.
(c) If a listed operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under Sec. 1926.1434.	(c) If a listed operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under § 1926.1434.	(3) If a listed operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under WAC 296-155-53400 (60) and (61) (crane/derrick modifications).
(d) Category I operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly shall be repaired no later than 7 days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 days of the	(d) *Category I operational aids and alternative measures*. Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 calendar days	(4) Category I operational aids and alternative measures. Operational aids listed in this subsection that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. **Exception:** If the employer documents that it has ordered

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occurrence of the deficiency, the repair shall be completed within 7 days of receipt of the parts.	of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts. See § 1926.1417(j) for additional requirements.	the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts.
(1) Boom hoist limiting device. (i) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. Temporary alternative measures (use at least one): (A) Use a boom angle indicator. (B) Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark. (C) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius. (ii) If the equipment was manufactured on or before December 16, 1969, and was not ~~originally~~ equipped with a boom hoist limiting device, at least one of the measures in paragraphs (d)(1)(i)(A) through (C) of this section shall be used, ~~on a permanent basis~~.	(1) *Boom hoist limiting device*. (i) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. *Temporary alternative measures (use at least one)*. One or more of the following methods must be used: (A) Use a boom angle indicator. (B) Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark. (C) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius. (ii) If the equipment was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the measures in paragraphs (d)(1)(i)(A) through (C) of this section must be used.	(a) Boom hoist limiting device (except for derricks with base mounted drums). (i) For cranes manufactured after December 16, 1969, a boom hoist limiting device is required. Temporary alternative measures. One or more of the following methods must be used: (A) Use a boom angle indicator. (B) Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark. (C) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius. (ii) If the crane was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the measures in subsection (4)(a)(i)(A) through (C) of this section must be used.
(2) Luffing jib limiting device. Equipment with a luffing jib shall have a luffing jib limiting device. Temporary alternative measures are the same as in paragraph (d)(1)(i) of this section, except to limit the movement of the luffing jib.	(2) *Luffing jib limiting device*. Equipment with a luffing jib must have a luffing jib limiting device. Temporary alternative measures are the same as in paragraph (d)(1)(i) of this section, except to limit the movement of the luffing jib rather than the boom hoist.	(b) Luffing jib limiting device. Cranes with a luffing jib must have a luffing jib limiting device. Temporary alternative measures are the same as in subsection (4)(a)(i) of this section, except to limit the movement of the luffing jib rather than the boom hoist.
(3) Anti two-blocking device. (i) Telescopic boom cranes manufactured after February 28,	(3) *Anti two-blocking device*. (i) Telescopic boom cranes manufactured after February 28,	(c) Anti two-blocking device. (This does not apply to dedicated pile drivers)

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1992, shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. Temporary alternative measures: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.	1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. *Temporary alternative measures*: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.	(i) Telescopic boom cranes manufactured after February 28, 1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. (A) Temporary alternative measures: Clearly mark the ~~cable~~ hoist rope (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and (B) ~~u~~Use a spotter when extending the boom.
(ii) Lattice boom cranes. (A) Lattice boom cranes manufactured after Feb 28, 1992, shall be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device(s) must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. (B) Lattice boom cranes, and derricks, manufactured one year after the effective date of this standard shall be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage/failure at all points where two-blocking could occur. (C) Exception. The requirements in paragraphs (d)(3)(ii)(A) and (B) of this section do not apply to such lattice boom	(ii) *Lattice boom cranes*. (A) Lattice boom cranes manufactured after Feb 28, 1992, must be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. (B) Lattice boom cranes and derricks manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage/failure at all points where two-blocking could occur. (C) *Exception*. The requirements in paragraphs (d)(3)(ii)(A)	(ii) Lattice boom cranes. (A) Lattice boom cranes manufactured after Feb 28, 1992, must be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device(s) must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. (B) Lattice boom cranes, and derricks, manufactured after the effective date of this standard must be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage/failure at all points where two-blocking could occur. **Exception:** The requirements in subsection (4)(c)(ii)(A) and (B) of this section do not apply to such lattice boom cranes

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equipment when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work. (D) Temporary alternative measures. Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter.	and (B) of this section do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work. (D) *Temporary alternative measures*. Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter.	when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work. (C) Temporary alternative measures. Clearly mark the hoist rope (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter.
	(iii) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoist must be equipped with a device that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device must prevent such damage at all points where two-blocking could occur. *Temporary alternative measures*: When two-blocking could only occur with movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. When two-blocking could occur without movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.	(iii) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoist must be equipped with a device that automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device must prevent such damage at all points where two-blocking could occur. *Temporary alternative measures*: When two-blocking could only occur with movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. When two-blocking could occur without movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.
(e) Category II operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly shall be repaired no later than 30 days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 days of the occurrence of the deficiency, and the part is not received in	(e) *Category II operational aids and alternative measures*. Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the	(5) Category II operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. **Exception:** If the employer documents that it has ordered

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time to complete the repair in 30 days, the repair shall be completed within 7 days of receipt of the parts.	part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts. See § 1926.1417(j) for additional requirements.	the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts.
(1) Boom angle or radius indicator. The equipment shall have a boom angle or radius indicator readable from the operator's station. Temporary alternative measures: Radii or boom angle shall be determined by measuring the radii or boom angle with a measuring device.	(1) *Boom angle or radius indicator*. The equipment must have a boom angle or radius indicator readable from the operator's station. *Temporary alternative measures*: Radii or boom angle must be determined by measuring the radii or boom angle with a measuring device.	(a) Boom angle or radius indicator (except for derricks with base mounted drum hoists). The crane must have a boom angle or radius indicator readable from the operator's station. Temporary alternative measures: Radii or boom angle must be determined by measuring the radii or boom angle with a measuring device.
(2) Jib angle indicator if the equipment has a luffing jib. Temporary alternative measures: Radii or jib angle shall be determined by ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.	(2) Jib angle indicator if the equipment has a luffing jib. *Temporary alternative measures*: Radii or jib angle must be determined by ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.	(b) Jib angle indicator if the crane has a luffing jib. Temporary alternative measures: Radii or jib angle must be determined by ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device.
(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length. Temporary alternative measures: One of the following methods shall be used: (i) Mark the boom with measured marks to calculate boom length; ~~or~~ (ii) Calculate boom length from boom angle and radius measurements; ~~or~~ (iii) Measure the boom with a measuring device.	(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length. *Temporary alternative measures*. One or more of the following methods must be used: (i) Mark the boom with measured marks to calculate boom length, (ii) Calculate boom length from boom angle and radius measurements, (iii) Measure the boom with a measuring device.	(c) Boom length indicator if the crane has a telescopic boom, except where the rated capacity is independent of the boom length. Temporary alternative measures: One or more of the following methods must be used: (i) Mark the boom with measured marks to calculate boom length; or (ii) Calculate boom length from boom angle and radius measurements; or (iii) Measure the boom with a measuring device.
(4) Load weighing and similar devices. Equipment (other than derricks) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds shall have at least one of the following: Load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter. Temporary alternative measures: The weight of the load shall be determined from a ~~reliable~~ source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a	(4) *Load weighing and similar devices*. (i) Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter. *Temporary alternative measures*: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a	(d) Load weighing and similar devices (this also applies to dedicated pile drivers manufactured more than one year after the effective date of this section). Cranes (other than derricks and articulating cranes) manufactured after March 29, 2003 must have at least one of the following: Load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter. (i) Temporary alternative measures: The weight of the load must be determined from a reliable source (such as the

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known per foot weight), ~~or by other equally reliable means~~. This information shall be provided to the operator prior to the lift.	calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift. (ii) Articulating cranes manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must have at least one of the following: automatic overload prevention device, load weighing device, load moment (or rated capacity) indicator, or load moment (rated capacity) limiter. *Temporary alternative measures*: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift.	load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift. (ii) Articulating cranes manufactured after the effective date of this section must have at least one of the following: automatic overload prevention device, load weighing device, load moment (or rated capacity) indicator, or load moment (rated capacity) limiter. *Temporary alternative measures*: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information must be provided to the operator prior to the lift.
(5) The following devices are required on equipment manufactured after January 1, 2008: (i) Outrigger position (horizontal beam extension) sensor/monitor if the equipment has outriggers. Temporary alternative measures: the operator shall verify that the position of the outriggers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger deployment. (ii) Hoist drum rotation indicator if the drum is not visible from the operator's station. Temporary alternative measures: Mark the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.	(5) The following devices are required on equipment manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]: (i) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. *Temporary alternative measures*: the operator must verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment. (ii) Hoist drum rotation indicator if the equipment has a hoist drum not visible from the operator's station. *Temporary alternative measures*: Mark the drum to indicate	(e) The following devices are required on cranes manufactured after the effective date of this section: (i) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the crane has outriggers or stabilizers. Temporary alternative measures: the operator must verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment. (ii) Hoist drum rotation indicator if the crane/derrick has a hoist drum is not visible from the operator's station. Temporary alternative measures: Mark the drum to indicate the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.

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	the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.	
Sec. 1926.1417 Operation.	**§ 1926.1417 Operation.**	
(a) The employer shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	(a) The employer must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	**WAC 296-155-53400(8)** (8) The employer must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.
(b) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer shall develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls must be developed by a qualified person. (3) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.	(b) *Unavailable operation procedures*. (1) Where the manufacturer procedures are unavailable, the employer must develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls must be developed by a qualified person. (3) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.	**WAC 296-155-53400 General Requirements.** (4) Unavailable operation procedures. (a) Where the manufacturer procedures are unavailable, the employer must provide all procedures necessary for the safe operation of the crane/derrick and attachments. (b) Procedures for the operational controls must be developed by a qualified person. (c) Procedures related to the capacity of the crane/derrick must be developed and signed by a registered professional engineer familiar with this equipment.
(c) Accessibility of procedures. (1) The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, shall be readily available in the cab at all times for use by the operator. (2) Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.	(c) *Accessibility of procedures*. (1) The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator. (2) Where rated capacities are available in the cab only in electronic form: in the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.	**WAC 296-155-53400(6)** (6) The procedures applicable to the operation of the crane/derrick including a legible and applicable operator's manual and load rating chart, written in the English language with customary grammar and punctuation, must be in the operator's cab or station when the crane is in operation. Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.
(d) The operator shall not engage in any practice that diverts his/her attention while actually engaged in operating the	(d) The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in	**WAC 296-155-53400(9)** (9) The operator must not engage in any practice or activity

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crane, such as the use of cell phones (other than when used for signal communications) ~~or other attention-diverting activities.~~	operating the equipment, such as the use of cellular phones (other than when used for signal communications).	that diverts his/her attention while actually engaged in operating the crane/derrick, such as the use of cellular phones (other than when used for signal communications).
(e) Leaving the equipment unattended. (1) The operator shall not leave the controls while the load is suspended, except where the following are met: (i) The operator remains adjacent to the equipment and is not engaged in any other duties. (ii) The load is to be held suspended for a period of time exceeding normal lifting operations. (iii) The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger functions. (iv) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees, including those listed in Sec. 1926.1425(b)(1) through (3), Sec. 1926.1425(d) or Sec. 1926.1425(e), shall be permitted in the fall zone. (2) The provisions in paragraph (e) of this section do not apply to working gear (such as slings, spreader bars, ladders, and welding machines) where the load is not suspended over an entrance or exit.	(e) *Leaving the equipment unattended*. (1) The operator must not leave the controls while the load is suspended, except where all of the following are met: (i) The operator remains adjacent to the equipment and is not engaged in any other duties. (ii) The load is to be held suspended for a period of time exceeding normal lifting operations. (iii) The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions. (iv) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees, including those listed in §§ 1926.1425(b)(1) through (3), § 1926.1425(d) or § 1926.1425(e), are permitted in the fall zone. (2) The provisions in § 1926.1417(e)(1) do not apply to working gear (such as slings, spreader bars, ladders, and welding machines) where the weight of the working gear is negligible relative to the lifting capacity of the equipment as positioned, and the working gear is suspended over an area other than an entrance or exit.	**WAC 296-155-53400(52)** (52) Leaving the crane/derrick unattended. The operator must not leave the controls while the load is suspended, except where all of the following are met: (a) The operator remains adjacent to the crane/derrick and is not engaged in any other duties. (b) The load is to be held suspended for a period of time exceeding normal lifting operations. (c) The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizers functions. (d) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees, including those listed in subsection (33)(b), (d) and (e) of this section, must be permitted in the fall zone. **Note:** For additional requirements relating to leaving the crane unattended for tower, self-erecting, overhead/bridge and derricks see: • WAC 296-155-53915, Tower cranes • WAC 296-155-54115, Self-erecting cranes • WAC 296-155-54215. Overhead/bridge • WAC 296-155-54320, Derricks ~~**Note:** Paragraph (37) of this section does not apply to working gear (such as slings, spreader bars, ladders, welding machines, generators, oxygen acetylene bottles) where the load is not suspended over an entrance or exit and the employer ensures there is no exposure of safety hazards to~~

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		~~employees.~~
(f) Tag-out. (1) Tagging out of service equipment/functions. Where the employer has taken the equipment out of service, a tag shall be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag shall be placed in a conspicuous position stating that the function is out of service and is not to be used. (2) Response to "do not operate"/tag-out signs. (i) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator shall not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it, or until the operator has verified that: (A) No one is servicing, working on, or otherwise in a dangerous position on the machine. (B) The equipment has been repaired and is working properly. (ii) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator shall not activate that switch or control until the sign has been removed by a person authorized to remove it, or until the operator has verified that the requirements in paragraphs (f)(2)(i)(A) and (B) of this section have been met.	(f) *Tag-out*. (1) *Tagging out of service equipment/functions*. Where the employer has taken the equipment out of service, a tag must be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used. (2) *Response to "do not operate"/ tag-out signs*. (i) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator must not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it, or until the operator has verified that: (A) No one is servicing, working on, or otherwise in a dangerous position on the machine. (B) The equipment has been repaired and is working properly. (ii) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator must not activate that switch or control until the sign has been removed by a person authorized to remove it, or until the operator has verified that the requirements in paragraphs (f)(2)(i)(A) and (B) of this section have been met.	**WAC 296-155-53400(69)** (69) Tag-out. (a) Tagging out of service. Where the employer has taken the crane/derrick out of service, a tag must be placed in the cab or at the operator station stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used. (b) Response to "do not operate"/tag-out signs. (i) If there is a warning (tag-out or maintenance/do not operate) sign on the crane/derrick or starting control, the operator must not activate the switch or start the crane/derrick until the sign has been removed by a person authorized to remove it, or until the operator has verified that: (A) No one is servicing, working on or otherwise in a dangerous position around the machine. (B) The crane/derrick has been repaired and is working properly. (ii) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator must not activate that switch or control until the sign has been removed by a person authorized to remove it, or until the operator has verified that the requirements in subsection (54)(b)(i)(A) and (B) of this section have been met. **Note:** For additional lockout/ tagout procedures for

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		electrical circuits, see WAC 296-155-429.
(g) Before starting the engine, the operator shall verify that all controls are in the proper starting position and that all personnel are in the clear.	(g) Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.	**WAC 296-155-53400 (16)** (16) Before starting the engine, the operator must verify that all controls are in the proper starting position and that all personnel are in the clear.
(h) Storm warning. When a local storm warning has been issued, the competent person shall determine whether it is necessary to implement manufacturer recommendations for securing the equipment.	(h) *Storm warning*. When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment.	**WAC 296-155-53400(67)** (67) Storm warning. When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the crane/derrick.
(i) [Reserved.]	(i) [*Reserved.*]	
(j) The operator shall be familiar with the equipment and its proper operation. If adjustments or repairs are necessary, the operator shall promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator.	(j) If equipment adjustments or repairs are necessary: (1) The operator must, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator; and (2) The employer must notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.	**WAC 296-155-53400(70)** (70) If equipment adjustments or repairs are necessary: (a) The operator must, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator; and (b) The employer must notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.
(k) Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.	(k) Safety devices and operational aids must not be used as a substitute for the exercise of professional judgment by the operator.	**WAC 296-155-53400(66)** (66) Safety devices and/or operational aids must not be used as a substitute for the exercise of professional judgment by the operator.
(l) [Reserved.]	(l) [*Reserved.*]	
(m) If the competent person determines that there is a slack rope condition requiring re-spooling of the rope, it shall be verified (before starting to lift) that the rope is seated on the drum and in the sheaves as the slack is removed.	(m) If the competent person determines that there is a slack rope condition requiring re-spooling of the rope, it must be verified (before starting to lift) that the rope is seated on the drum and in the sheaves as the slack is removed.	**WAC 296-155-53400 (54)** (54) Before starting to lift the following conditions must be met: (d) If there is slack rope condition, it must be determined that the rope is seated on the drum and in the sheaves as the slack is removed.
(n) The competent person shall consider the effect of wind,	(n) The competent person must adjust the equipment and/or	**WAC 296-155-53400 (54)**

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ice, and snow on equipment stability and rated capacity.	operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.	(54) Before starting to lift the following conditions must be met: (e) The competent person must adjust the crane/derrick and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.
(o) Compliance with rated capacity. (1) The equipment shall not be operated in excess of its rated capacity. (2) The operator shall not be required to operate the equipment in a manner that would violate paragraph (o)(1) of this section. (3) Load weight. The operator shall verify that the load is within the rated capacity of the equipment by at least one of the following methods: (i) The weight of the load shall be determined from a ~~reliable~~ source (such as the load's manufacturer), by a ~~reliable~~ calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information shall be provided to the operator prior to the lift; or (ii) The operator shall begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter, if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation. If it does, the operator shall not proceed with the lift until he/she verifies the weight of the load in accordance with paragraph (o)(3)(i) of this section.	(o) *Compliance with rated capacity*. (1) The equipment must not be operated in excess of its rated capacity. (2) The operator must not be required to operate the equipment in a manner that would violate paragraph (o)(1) of this section. (3) *Load weight*. The operator must verify that the load is within the rated capacity of the equipment by at least one of the following methods: (i) The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information must be provided to the operator prior to the lift; or (ii) The operator must begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter, if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation. If it does, the operator must not proceed with the lift until he/she verifies the weight of the load in accordance with paragraph (o)(3)(i) of this section.	**WAC 296-155-53400(64)** (64) Load weight. The operator must verify that the load is within the rated capacity of the crane/derrick by at least one of the following methods: (a) The weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information must be provided to the operator prior to the lift; or (b) The operator must begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter. If the load exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation, the operator must not proceed with the lift until it is verified that the weight of the load is in accordance with subsection (64)(a) of this section.
(p) The boom or other parts of the equipment shall not	(p) The boom or other parts of the equipment must not	**WAC 296-155-53400 (41)**

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contact any obstruction.	contact any obstruction.	**WAC 296-155-53400 (55)** (55) During lifting operations, care must be taken that there is no sudden acceleration or deceleration of the moving load and that the load boom or other parts of the crane do not contact any obstruction. Rotational speed of the crane/derrick must be such that the load does not swing out beyond the radius at which it can be controlled.
(q) The equipment shall not be used to drag or pull loads sideways.	(q) The equipment must not be used to drag or pull loads sideways.	**WAC 296-155-53400 (56)** (56) Side loading of booms (jibs) must be limited to freely suspended loads. Cranes must not be used for dragging loads sideways.
(r) On wheel-mounted equipment, no loads shall be lifted over the front area, except as permitted by the manufacturer.	(r) On wheel-mounted equipment, no loads must be lifted over the front area, except as permitted by the manufacturer.	**WAC 296-155-53715 (2)** (2) On wheel-mounted cranes, loads must not be lifted over the front area, except as permitted by the crane manufacturer.
(s) The operator shall test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.	(s) The operator must test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.	**WAC 296-155-53400(57)** (57) The operator must test the brakes each time a load is within ninety percent of the rated capacity of the crane by lifting it a few inches and applying the brakes. The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.
(t) Neither the load nor the boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.	(t) Neither the load nor the boom must be lowered below the point where less than two full wraps of rope remain on their respective drums.	**WAC 296-155-53400 (18)** (18) Neither the load nor the boom is allowed to be lowered below the point where less than two full wraps of rope remain on their respective drums.
(u) Traveling with a load. (1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (2) Where traveling with a load, the employer shall ensure that: (i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes	(u) *Traveling with a load*. (1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (2) Where traveling with a load, the employer must ensure that: (i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes	**WAC 296-155-53400 (35)** (35) Before traveling a crane with a load, it must be determined that this practice is not prohibited by the manufacturer. If not, a qualified person must be responsible for the operation. Decisions such as the necessity to reduce crane ratings, load position, boom location, ground support, travel route, and speed of movement must be in accordance

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determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (ii) The determinations of the competent person required in paragraph (u)(2)(i) of this section are implemented. (iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.	determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (ii) The determinations of the competent person required in paragraph (u)(2)(i) of this section are implemented. (iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.	with that person's determination. Specified tire pressure must be maintained. The boom should be carried in line with the direction of travel. Sudden starts and stops should be avoided. Tag or restraint lines must be used to control swinging of the load.
(v) Rotational speed of the equipment shall be such that the load does not swing out beyond the radius at which it can be controlled.	(v) Rotational speed of the equipment must be such that the load does not swing out beyond the radius at which it can be controlled.	**WAC 296-155-53400 General Requirements.** (40) During lifting operations, care must be taken that there is no sudden acceleration or deceleration of the moving load and that the load boom or other parts of the crane do not contact any obstruction. Rotational speed of the crane/derrick must be such that the load does not swing out beyond the radius at which it can be controlled.
(w) A tag or restraint line shall be used if necessary to prevent rotation of the load that would be hazardous.	(w) A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.	**WAC 296-155-53400(65)** (65) Tag lines or restraint lines must be used when rotation or swinging of the load is hazardous or if the load needs guidance. Taglines are not required when all of the following criteria are met: • The suspended load can be expected to remain still when in a static (non-moving) condition or does not swing or rotate in a hazardous manner. • The movement of the crane or boom cannot be expected to cause the load to swing or rotate in an uncontrolled manner that may create a hazard. • The operator is in control of the movement of the load and a hazardous condition is not created.
(x) The brakes shall be adjusted in accordance with manufacturer procedures to prevent unintended movement.	(x) The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.	**WAC 296-155-53400 General Requirements.** (42) The operator must test the brakes each time a load is within ninety percent of the rated capacity of the crane by lifting it a few inches and applying the brakes. The brakes

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		must be adjusted in accordance with manufacturer procedures to prevent unintended movement.
(y) The operator shall obey a stop (or emergency stop) signal, irrespective of who gives it.	(y) The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.	**WAC 296-155-53406 Signals** (9) Anyone who becomes aware of a safety problem must alert the operator or signal person by giving the stop or emergency stop signal. The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.
(z) Swinging locomotive cranes. A locomotive crane shall not be swung into a position where ~~it is reasonably foreseeable that~~ railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.	(z) *Swinging locomotive cranes*. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.	**WAC 296-155-53400(73)** (73) Swinging locomotive cranes. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.
(aa) Counterweight/ballast. (1) The following applies to equipment other than tower cranes: (i) Equipment shall not be operated without the counterweight or ballast in place as specified by the manufacturer. (ii) The maximum counterweight or ballast specified by the manufacturer for the equipment shall not be exceeded. (2) Counterweight/ballast requirements for tower cranes are specified in Sec. 1926.1435(b)(8).	(aa) *Counterweight/ballast*. (1) The following applies to equipment other than tower cranes: (i) Equipment must not be operated without the counterweight or ballast in place as specified by the manufacturer. (ii) The maximum counterweight or ballast specified by the manufacturer for the equipment must not be exceeded. (2) Counterweight/ballast requirements for tower cranes are specified in § 1926.1435(b)(8).	**WAC 296-155-53715(7)** (7) Cranes must not be operated without the ballast or counterweight being in place as specified by the crane manufacturer. Under specific conditions, such as during crane assembly or unusual boom configurations, the crane manufacturer's recommendations for the amount of ballast or counterweight must be adhered to. The maximum ballast or counterweight approved by the manufacturer for use on a given crane must not be exceeded. **WAC 296-155-54300** (14) Derrick superstructures and counterjibs (counterweight jib) must be arranged to receive counterweights, made in accordance with the manufacturer's specifications for the specified jib or boom length, and to hold them in position. Means must be provided to guard against shifting or dislodgement during derrick operation. Manufacturer's specified counterweight weights are not to be exceeded. For tower cranes see WAC 296-155-539. For self-erecting see WAC 296-155-541.

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Sec. 1926.1418 Authority to stop operation.	**§ 1926.1418 Authority to stop operation.**	
Whenever there is a concern as to safety, the operator shall have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.	Whenever there is a concern as to safety, the operator must have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.	**WAC 296-155-53400(68)** (68) Whenever there is a concern as to safety, the operator has the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.
Sec. 1926.1419 Signals--general requirements.	**§ 1926.1419 Signals – general requirements**.	**WAC 296-155-53406 Signals**
(a) A signal person must be provided in each of the following situations: (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (2) When the equipment is traveling, the view in the direction of travel is obstructed. (3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.	(a) A signal person must be provided in each of the following situations: (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (2) When the equipment is traveling, the view in the direction of travel is obstructed. (3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.	(1) A qualified signal person that meets the requirements in WAC 296-155-53302 must be provided in each of the following situations: (a) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (b) When the crane is traveling, the view in the direction of travel is obstructed. (c) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.
(b) Types of signals. Signals to operators must be by hand, voice, audible, or new signals.	(b) *Types of signals*. Signals to operators must be by hand, voice, audible, or new signals.	(2) Types of signals. Signals to operators must be by hand, voice, audible, or other means at least as effective.
(c) Hand signals. (1) When using hand signals, the Standard Method must be used (see Appendix A of this subpart). Exception: where use of the Standard Method for hand signals is infeasible, or where an operation or use of an attachment is not covered in the Standard Method, non-standard hand signals may be used in accordance with paragraph (c)(2) of this section ~~(see Appendix B of this subpart for an example). The following requirements apply to the use of non-standard hand signals:~~ (2) Non-standard hand signals. When using non-standard hand signals, the signal person, operator, and lift supervisor	(c) *Hand signals*. (1) When using hand signals, the Standard Method must be used (see Appendix A of this subpart). *Exception*: Where use of the Standard Method for hand signals is infeasible, or where an operation or use of an attachment is not covered in the Standard Method, non-standard hand signals may be used in accordance with paragraph (c)(2) of this section. (2) *Non-standard hand signals*. When using non-standard hand signals, the signal person, operator, and lift director (where there is one) must contact each other prior to the operation and agree on the non-standard hand signals that	(3) Hand signals. (a) When using hand signals, the standard method as established in the applicable ASME B30 standards must be used. Where use of the standard method for hand signals is infeasible, or where an operation or use of an attachment is not covered in the standard method, non-standard hand signals may be used in accordance with subsection (3)(b) of this section. (b) Non-standard hand signals. When using non-standard hand signals, the signal person, operator, and lift director (when there is one) must contact each other prior to the

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(where there is one) shall contact each other prior to the operation and agree on the non-standard hand signals that will be used.	will be used.	operation and agree on the non-standard hand signals that will be used.
(d) New signals. Signals other than hand, voice or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or (2) There is a national consensus standard for the new signals.	(d) *New signals*. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or (2) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.	(4) Signals other than hand, voice or audible signals may be used where the employer demonstrates that the signals provided are at least equally effective communications as voice, audible, or standard method hand signals.
(e) Suitability. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.	(e) *Suitability*. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.	(e) The signals used (hand, voice, audible, or other effective means), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.) must be appropriate for the site conditions.
(f) During operations requiring signals, the ability to transmit signals between the operator and signal person shall be maintained. If that ability is interrupted at any time, the operator shall safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.	(f) During operations requiring signals, the ability to transmit signals between the operator and signal person must be maintained. If that ability is interrupted at any time, the operator must safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.	(6) Communication between the crane operator and the signalperson must be maintained continuously during all crane movements. If at any time communication is disrupted, the operator must stop all crane movements until communication is restored and a proper signal is given and understood.
(g) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations shall not resume until the operator and signal person agree that the problem has been resolved.	(g) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.	(7) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator must safely stop operations. Operations must not resume until the operator and signal person agree that the problem has been resolved.
(h) Only one person gives signals to a crane/derrick at a time, except in circumstances covered by paragraph (j) of this section.	(h) Only one person may give signals to a crane/derrick at a time, except in circumstances covered by paragraph (j) of this section.	(8) Only one person gives signals to a crane/derrick at a time, except in circumstances covered by subsection (9) of this section.
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Anyone who becomes aware of a safety problem must	(j) Anyone who becomes aware of a safety problem must	(9) Anyone who becomes aware of a safety problem must

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alert the operator or signal person by giving the stop or emergency stop signal. (Note: Sec. 1926.1417(y) requires the operator to obey a stop or emergency stop signal).	alert the operator or signal person by giving the stop or emergency stop signal. (NOTE: § 1926.1417(y) requires the operator to obey a stop or emergency stop signal).	alert the operator or signal person by giving the stop or emergency stop signal. The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.
(k) All directions given to the operator by the signal person shall be given from the operator's direction perspective.	(k) All directions given to the operator by the signal person must be given from the operator's direction perspective.	(10) All directions given to the operator by the signal person must be given from the operator's direction perspective.
(l) [Reserved.]	(l) [*Reserved*.]	
(m) Communication with multiple cranes/derricks. Where a signal person(s) is in communication with more than one crane/derrick, a system for identifying the crane/derrick each signal is for ~~must be used,~~ as follows: (1) For each signal, prior to giving the function/direction, the signal person shall identify the crane/derrick the signal is for, or (2) An equally effective method of identifying which crane/derrick the signal is for ~~must be used~~.	(m) *Communication with multiple cranes/derricks*. Where a signal person(s) is in communication with more than one crane/derrick, a system must be used for identifying the crane/derrick each signal is for, as follows: (1) for each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for, or (2) must use an equally effective method of identifying which crane/derrick the signal is for.	(11) Communication with multiple cranes/derricks. Where a signal person(s) is in communication with more than one crane/derrick, a system for identifying the crane/derrick ~~that~~ for which each signal is intended must be used, as follows: (a) For each signal, prior to giving the function/direction, the signal person must identify the crane/derrick for which the signal is intended, or (b) An equally effective method of identifying which crane/derrick the signal is intended for must be used.
Sec. 1926.1420 Signals--radio, telephone or other electronic transmission of signals.	**§ 1926.1420 Signals – radio, telephone or other electronic transmission of signals**.	
(a) The device(s) used to transmit signals shall be tested on site before beginning operations to ensure that the signal transmission is clear and reliable.	(a) The device(s) used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.	(13) Radio, telephone or other electronic transmission of signals. (a) The device(s) used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.
(b) Signal transmission must be through a dedicated channel. Exception: Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations.	(b) Signal transmission must be through a dedicated channel, except: (1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.	(b) Signal transmission must be through a dedicated channel, except: (i) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (ii) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks.

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(c) The operator's reception of signals must be by a hands-free system.	(c) The operator's reception of signals must be by a hands-free system.	(c) The operator's reception of signals must be made by a hands-free system.
Sec. 1926.1421 Signals--voice signals--additional requirements.	**§ 1926.1421 Signals – voice signals – additional requirements**.	
(a) Prior to beginning operations, the operator, signal person and lift supervisor (if there is one), shall contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is substituted, there is confusion about the voice signals, or a voice signal is to be changed.	(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), must contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.	(5) Use and suitability. (a) Prior to beginning operations, the operator, signal person, and lift director (if there is one), must contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these employees need not meet again to discuss voice signals unless another employee is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.
(b) Each voice signal shall contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.	(b) Each voice signal must contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.	(b) Each voice signal must contain the following three elements, given in the following order: function (such as hoist, boom, etc.) and direction; distance and/or speed; function stop. **Note:** These are some examples of signals: • Swing right 50 feet, 25 feet, 15 feet, 10 feet, 5 feet, 2 feet, swing stop • Load down 100 feet, 50 feet, 40 feet, 30 feet, …2 feet, load stop • Load up slow, slow, slow, load stop.
(c) The operator, signal person and lift supervisor (if there is one), shall be able to effectively communicate in the language used.	(c) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.	(d) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.
Sec. 1926.1422 Signals--hand signal chart.	**§ 1926.1422 Signals – hand signal chart**.	
Hand signal charts must be either posted on the equipment or readily available at the site.	Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.	(12) Hand signal chart. Hand signal charts must be either posted on the crane/derrick or conspicuously posted in the vicinity of the hoisting operations.
Sec. 1926.1423 Fall protection.	**§ 1926.1423 Fall protection**.	**WAC 296-155-53403**
(a) Application.	(a) *Application*.	(1) Application.

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(1) Paragraphs (b), (c)(2), (d) and (e) of this section apply to all equipment covered by this subpart except tower cranes. (2) Paragraph (c)(1), (f) and (h) of this section applies to all equipment covered by this subpart. (3) Paragraph (g) of this section applies only to tower cranes.	(1) Paragraphs (b), (c)(3), (e) and (f) of this section apply to all equipment covered by this subpart except tower cranes. (2) Paragraphs (c)(1), (c)(2), (d), (g), (j) and (k) of this section apply to all equipment covered by this subpart. (3) Paragraphs (c)(4) and (h) of this section apply only to tower cranes.	(a) Paragraphs (2), (3)(b), (5) and (6) of this section apply to all equipment covered by this part except tower cranes. (b) Paragraphs (3)(a), (4), (7), (10) and (11) of this section apply to all equipment covered by this part. (c) Paragraphs (3)(c) and (9) of this section apply only to tower cranes.
(b) Boom walkways. (1) Equipment manufactured more than one year after the effective date of this standard with lattice booms shall be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. (2) Boom walkway criteria. (i) The walkways shall be at least 12 inches wide. (ii) Guardrails, railings and other permanent fall protection attachments along walkways are: (A) Not required. (B) Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/attachments could be snagged by the ropes or bars. (C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). (D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.	(b) *Boom walkways*. (1) Equipment manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] with lattice booms must be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. (2) *Boom walkway criteria*. (i) The walkways must be at least 12 inches wide. (ii) Guardrails, railings and other permanent fall protection attachments along walkways are: (A) Not required. (B) Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/attachments could be snagged by the ropes or bars. (C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). (D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.	(2) Boom walkways. (a) Cranes/derricks manufactured after the effective date of this section with lattice booms must be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. (b) Boom walkway criteria. (i) The walkways must be at least 12 inches wide. (ii) Guardrails, railings and other permanent fall protection attachments along walkways are: (A) Not required. (B) Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/attachments could be snagged by the ropes or bars. (C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). (D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.
(c) Steps, handholds, grabrails, guardrails and railings. (1) The employer shall maintain originally equipped steps, handholds, ladders and guardrails/railings/grabrails ~~in good condition~~. (2) Equipment manufactured more than one year after the effective date of this standard shall be equipped so as to	(c) *Steps, handholds, ladders, grabrails, guardrails and railings*. (1) Section 1926.502(b) does not apply to equipment covered by this subpart. (2) The employer must maintain in good condition originally-equipped steps, handholds, ladders and	(3) Steps, handholds, ladders, grabrails, guardrails and railings. ~~(a) Section 1926.502(b) does not apply to cranes covered by this part.~~ (a) The employer must maintain in good condition originally-equipped steps, handholds, ladders and

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provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These shall meet the following criteria: (i) Steps, ladders and guardrails/railings/grabrails shall meet the requirements of SAE J185 (May 2003) or ISO 11660-2 (1994), except where infeasible. (ii) Walking/stepping surfaces, except for crawler treads, shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	guardrails/railings/grabrails. (3) Equipment manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails /railings/grabrails. These devices must meet the following criteria: (i) Steps, handholds, ladders and guardrails/railings/grabrails must meet the criteria of SAE J185 (May 2003) (incorporated by reference, see § 1926.6) or ISO 11660-2:1994(E) (incorporated by reference, see § 1926.6) except where infeasible. (ii) Walking/stepping surfaces, except for crawler treads, must have slip resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	guardrails/railings/grabrails. (b) Cranes manufactured after the effective date of this section must be equipped so as to provide safe access and egress between the ground and the operator work station(s), including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria: (i) Steps, handholds, ladders and guardrails/railings/grabrails must meet the criteria of SAE J185 (May 2003) or ISO 11660-2:1994(E) except where infeasible. (ii) Walking/stepping surfaces, except for crawler treads, must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).
	(4) Tower cranes manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria: (i) Steps, handholds, ladders, and guardrails/railings/grabrails must meet the criteria of ISO 11660-1:2008(E) (incorporated by reference, see § 1926.6) and ISO 11660-3:2008(E) (incorporated by reference, see § 1926.6) or SAE J185 (May 2003) (incorporated by reference, see § 1926.6) except where infeasible.	(c) Tower cranes manufactured after the effective date of this section must be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower (mast), by the provision of devices such as steps, handholds, ladders, and guardrails/railings/grabrails. These devices must meet the following criteria: (i) Steps, handholds, ladders, and guardrails/railings/grabrails must meet the criteria of ISO 11660-1:2008(E) and ISO 11660-3:2008(E) or SAE J185 (May 2003) except where infeasible. (ii) Walking/stepping surfaces must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-

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	(ii) Walking/stepping surfaces must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	resistant paint).
	(d) *Personal fall arrest and fall restraint systems*. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in § 1926.502(d) except that § 1926.502(d)(15) does not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses must be used in personal fall arrest and fall restraint systems.	(4) Personal fall arrest and fall restraint systems. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in WAC 296-155-24510 ~~except that WAC 296-155-24510(2)(a)(ix) does not apply to components used in personal fall arrest and fall restraint systems~~. ~~Either body belts or~~ Body harnesses must be used in personal fall arrest and fall restraint systems.
(d) For non-assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows: (1) When moving point-to-point: (i) On non-lattice booms (whether horizontal or not horizontal). (ii) On lattice booms that are not horizontal. (2) While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	(e) For non-assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows: (1) When moving point-to-point: (i) On non-lattice booms (whether horizontal or not horizontal). (ii) On lattice booms that are not horizontal. (iii) On horizontal lattice booms where the fall distance is 15 feet or more. (2) While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	(5) For non-assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows: (a) When moving point-to-point: (i) On non-lattice booms (whether horizontal or not horizontal). (ii) On lattice booms that are not horizontal. (iii) On horizontal lattice booms where the fall distance is 10 feet or more. (b) While at a work station on any part of the crane (including the boom, of any type), except when the employee is at or near draw-works (when the crane is running), in the cab, or on the deck.
(e) For assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works	(f) For assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works	(6) For assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 10 feet above a lower level, except when the employee is at or near draw-works

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(when the equipment is running), in the cab, or on the deck.	(when the equipment is running), in the cab, or on the deck.	(when the crane is running), in the cab, or on the deck.
(f) Anchorage criteria. (1) Anchorages for fall arrest and positioning device systems. (i) Personal fall arrest systems ~~and positioning systems~~ shall be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the ~~applicable~~ criteria in Sec. 1926.502 would not be met. (ii) Attachable anchor devices (portable anchor devices that are attached to the equipment) shall meet the ~~applicable~~ anchorage criteria in Sec. 1926.502. (2) Anchorages for restraint systems. Restraint systems shall be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.	(g) *Anchorage criteria*. (1) Sections 1926.502(d)(15) and 1926.502(e)(2) apply to equipment covered by this subpart only to the extent delineated in paragraph (g)(2) of this section. (2) *Anchorages for personal fall arrest and positioning device systems*. (i) Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(d)(15) would not be met. (ii) Positioning device systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(e)(2) would not be met. (iii) Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in § 1926.502(d)(15) for personal fall arrest systems and § 1926.502(e)(2) for positioning device systems. (3) *Anchorages for fall restraint systems*. Fall restraint systems must be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.	(7) Anchorage criteria. (a) Anchorages used for attachment of personal fall arrest equipment must be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, or must be designed, installed, and used as follows: (i) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and (ii) Under the supervision of a qualified person. (b) Positioning devices must be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds (13.3 kN), whichever is greater. (c) Anchorages for personal fall arrest and positioning device systems. (i) Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in subsection (7)(a) above would not be met. (ii) Positioning device systems must be anchored to any apparently substantial part of the crane unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in subsection (7)(b) above would not be met. (iii) Attachable anchor devices (portable anchor devices that are attached to the crane) must meet the anchorage criteria in subsection (7)(a) above for personal fall arrest systems and subsection (7)(b) above for positioning device systems. (8) Anchorages for fall restraint systems. Fall restraint

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		systems must be anchored to any part of the crane that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.
(g) Tower cranes. (1) For non-erecting/dismantling work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck. (2) For erecting/dismantling work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level.	(h) *Tower cranes*. (1) For work other than erecting, climbing, and dismantling, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck. (2) For erecting, climbing, and dismantling work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level.	(9) Tower cranes. (a) For work other than erecting, climbing, and dismantling, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level, except when the employee is at or near draw-works (when the crane is running), in the cab, or on the deck. (b) For erecting, climbing, and dismantling work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 10 feet above a lower level.
	(i) [*Reserved*.]	
(h) Anchoring to the load line. A fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where the following requirements are met: (1) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements in Sec. 1926.502(d)(15). (2) The equipment operator shall be at the work site and informed that the equipment is being used for this purpose.	(j) *Anchoring to the load line*. A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met: (1) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements in § 1926.502(d)(15). (2) The equipment operator must be at the work site and informed that the equipment is being used for this purpose. (3) No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).	(10) Anchoring to the load line. A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met: (a) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements in subsection (7)(a) above. (b) The crane operator must be at the work site and informed that the crane is being used for this purpose. (c) No load is suspended from the load line when the personal fall arrest system is anchored to the crane/derrick's hook (or other part of the load line).
	(k) *Training*. The employer must train each employee who	(11) Training. The employer must train each employee who

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	may be exposed to fall hazards while on, or hoisted by, equipment covered by this subpart on all of the following: (1) the requirements in this subpart that address fall protection. (2) the applicable requirements in §§ 1926.500 and 1926.502.	may be exposed to fall hazards while on, or hoisted by, equipment covered by this part on all of the following: (a) The requirements in this subpart that address fall protection. (b) The applicable requirements in Parts C-1 and K of this chapter.
Sec. 1926.1424 Work area control.	**§ 1926.1424 Work area control.**	
(a) Swing radius hazards. (1) The requirements in paragraph (a)(2) of this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of: (i) Striking and injuring an employee; or (ii) Pinching/crushing an employee against another part of the equipment or another object. (2) To prevent employees from entering these hazard areas, the employer shall: (i) Instruct employees assigned to work on or near the equipment ("authorized personnel") in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure. (ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. Exception: where it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas shall be clearly marked by a combination of warning signs (such as "Danger--Swing/Crush Zone" ~~or "Danger--This Thing's Gonna Swing and Crunch You--Zone")~~ and high visibility markings on the equipment that identify the hazard areas. In addition, the employer shall train the employees to understand what these markings signify.	(a) *Swing radius hazards*. (1) The requirements in paragraph (a)(2) of this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of: (i) Striking and injuring an employee; or (ii) Pinching/crushing an employee against another part of the equipment or another object. (2) To prevent employees from entering these hazard areas, the employer must: (i) Train each employee assigned to work on or near the equipment ("authorized personnel") in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure. (ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. *Exception*: When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as "Danger – Swing/Crush Zone") and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.	**WAC 296-155-53400(42)** (42) Swing radius hazards. (a) The requirements in subsection (42)(b) of this section apply where there are accessible areas in which the crane's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of: (i) Striking and injuring an employee; or (ii) Pinching/crushing an employee against another part of the crane or another object. (b) To prevent employees from entering these hazard areas, the employer must: (i) Train each employee assigned to work on or near the crane ("authorized personnel") in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure. (ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. **Exception:** When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the crane, the hazard areas must be clearly marked by a combination of warning signs and high visibility markings on the crane that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.

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(3) Protecting employees in the hazard area. (i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location. (ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator shall not rotate the superstructure until the operator: (A) Gives a warning that is understood by the employee as a signal that the superstructure is about to be rotated and allows time for the employee to get to a safe position, or (B) Is informed in accordance with a pre-arranged system of communication that the employee is in a safe position.	(3) *Protecting employees in the hazard area*. (i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location. (ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a prearranged system of communication that the employee is in a safe position.	(c) Protecting employees in the hazard area. (i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location. (ii) Where the operator knows that an employee went to a location covered by subsection (43)(c)(i) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a pre-arranged system of communication that the employee is in a safe position.
(b) ~~Multiple equipment coordination.~~ Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity shall institute a system to coordinate operations. If there is no controlling entity, the employers shall institute such a system.	(b) Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment), or employers, must institute such a system.	**WAC 296-155-53400(40)** (40) Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity must institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment), or employers, must institute such a system.
Sec. 1926.1425 Keeping clear of the load.	**§ 1926.1425 Keeping clear of the load**.	**WAC 296-155-53400 General Requirements.**
(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads shall be used, to the extent consistent with public safety. (b) While the operator is not moving a suspended load, no employee shall be within the fall zone, except for employees: (1) Engaged in hooking, unhooking or guiding a load, ~~or~~ (2) Engaged in the initial attachment of the load to a component or structure, or (3) Operating a concrete hopper or concrete bucket.	(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety. (b) While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees: (1) Engaged in hooking, unhooking or guiding a load; (2) Engaged in the initial attachment of the load to a component or structure; or (3) Operating a concrete hopper or concrete bucket.	**WAC 296-155-53400(43)** (43) Keeping clear of the load. (a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used. (b) While the operator is not moving a suspended load, no employee is allowed to be within the fall zone, except for employees: (i) Engaged in hooking, unhooking or guiding a load, or (ii) Engaged in the initial attachment of the load to a component structure, or

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(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, the following criteria shall be met: (1) The materials being hoisted shall be rigged to prevent unintentional displacement. (2) Hooks with self-closing latches or their equivalent shall be used. Exception: "J" hooks are permitted to be used for setting wooden trusses. (3) The materials shall be rigged by a qualified rigger. (d) Receiving a load. Only employees needed to receive a load ~~shall be~~ permitted to be within the fall zone when a load is being landed. (e) During a tilt-up or tilt-down operation: (1) No employee shall be directly under the load. (2) Only employees essential to the operation shall be in the fall zone (but not directly under the load). Note ~~to Sec. 1926.1425~~: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see Sec. 1926.1426.	(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria must be met: (1) The materials being hoisted must be rigged to prevent unintentional displacement. (2) Hooks with self-closing latches or their equivalent must be used. *Exception*: "J" hooks are permitted to be used for setting wooden trusses. (3) The materials must be rigged by a qualified rigger. (d) *Receiving a load*. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed. (e) During a tilt-up or tilt-down operation: (1) No employee must be directly under the load. (2) Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: (1) physically guide the load; (2) closely monitor and give instructions regarding the load's movement; or (3) either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing). NOTE: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see § 1926.1426.	(iii) Operating a concrete hopper or concrete bucket. (c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria must be met: (i) The materials being hoisted must be rigged to prevent unintentional displacement. (ii) Hooks with self-closing latches or their equivalent must be used. "J" hooks are permitted to be used for setting wooden trusses. (iii) The materials must be rigged by a qualified rigger. (d) Receiving a load. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed. (e) During a tilt-up or tilt-down operation: (i) Employees are not allowed to be directly under the load. (ii) Only employees' essential to the operation are allowed to be in the fall zone (but not directly under the suspended load). Note: An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: • Physically guide the load; • Closely monitor and give instructions regarding the load's movement; or • Either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing). (f) Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is

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		prohibited when an employee is directly under the load. See subsection (44) of this section.
Sec. 1926.1426 Free fall and controlled load lowering.	**§ 1926.1426 Free fall and controlled load lowering.**	**WAC 296-155-53400.**
(a) Boom free fall prohibitions. (1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (i) An employee is in the fall zone of the boom or load. (ii) An employee is being hoisted. (iii) The load or boom is directly over a power line, or over any part of the area extending the Table A (of Sec. 1926.1408) clearance distance to each side of the power line. (iv) The load is over a shaft. (v) The load is over a cofferdam, except where there are no employees in the fall zone. (vi) Lifting operations are taking place in a refinery or tank farm. (2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in paragraph (a)(1) of this section are present and: (i) The equipment was manufactured prior to October 31, 1984, or (ii) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.	(a) *Boom free fall prohibitions*. (1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (i) An employee is in the fall zone of the boom or load. (ii) An employee is being hoisted. (iii) The load or boom is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line; or any part of the area extending the Table A clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load. (iv) The load is over a shaft, except where there are no employees in the shaft. (v) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load. (vi) Lifting operations are taking place in a refinery or tank farm. (2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in paragraph (a)(1) of this section are present and: (i) The equipment was manufactured prior to October 31, 1984; or (ii) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.	**WAC 296-155-53400(44)** (44) Boom free fall prohibitions. (a) The use of cranes in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (i) An employee is in the fall zone of the boom or load. (ii) An employee is being hoisted. (iii) The load or boom is directly over a power line, or over any part of the area listed in Table 4 located in WAC 296-155-53408, clearance distance to each side of the power line; or any part of the area extending the Table 4 clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load. (iv) The load is over a shaft, except where there are no employees in the shaft. (v) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load. (vi) Lifting operations are taking place in a refinery or tank farm. (b) The use of cranes in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in subsection (44)(a) of this section are present and: (i) The crane was manufactured prior to October 31, 1984 (sideboom cranes in which the boom is designed to freefall is permitted only if manufactured prior to the effective date of this section), or (ii) The crane is a floating crane or a land crane on a vessel/flotation device.

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(b) Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited ~~(see paragraph (a)(1) of this section)~~, the boom hoist shall have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows: (1) Friction drums shall have: (i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (ii) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors shall be considered brake or locking devices for purposes of this subpart. (4) Hydraulic boom cylinders shall have an integrally mounted holding device.	(b) *Preventing boom free fall*. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows: (1) Friction drums must have: (i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (ii) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart. (4) Hydraulic boom cylinders must have an integrally mounted holding device.	**WAC 296-155-53400** **WAC 296-155-53400(45)** (45) Preventing boom free fall. Where the use of a crane with a boom that is designed to free fall (live boom) is prohibited (see subsection (44)(a) of this section), the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows: (a) Friction drums must have: (i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (ii) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (b) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (c) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this part. (d) Hydraulic boom cylinders must have an integrally mounted holding device.
(c) Preventing uncontrolled retraction. Hydraulic telescoping booms shall have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.	(c) *Preventing uncontrolled retraction*. Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.	**WAC 296-155-53400(46)** (46) Preventing uncontrolled retraction. Hydraulic telescoping booms must have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.
(d) Load line free fall. In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited:	(d) *Load line free fall*. In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited:	**WAC 296-155-53400(47)** (47) Load line free fall. In each of the following circumstances, controlled load lowering is required and free

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(1) An employee is directly under the load. (2) An employee is being hoisted. (3) The load is directly over a power line, or over any part of the area extending the Table A clearance distance to each side of the power line. (4) The load is over a shaft ~~or cofferdam~~.	(1) An employee is directly under the load. (2) An employee is being hoisted. (3) The load is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line; or any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line is within the radius of vertical travel of the load. (4) The load is over a shaft. (5) The load is over a cofferdam, except where there are no employees in the fall zone of the load.	fall of the load line hoist is prohibited: (a) An employee is directly under the load. (b) An employee is being hoisted. (c) The load is directly over a power line, or over any part of the area listed in Table 4, located in WAC 296-155-53408, clearance distance to each side of the power line; or any part of the area extending the Table 4 of WAC 296-155-53408, clearance distance to each side of the power line is within the radius of vertical travel of the load. (d) The load is over a shaft. (e) The load is over a cofferdam, except where there are no employees in the fall zone of the load.
Sec. 1926.1427 Operator qualification and certification.	**§ 1926.1427 Operator qualification and certification.**	**WAC 296-155-53300 Operator qualifications and certification.**
(a) The employer must ensure that, prior to operating any equipment covered under Sec. 1926.1400, the operator is ~~either qualified or certified to~~ operate the equipment ~~in accordance with one of the options in paragraphs (b) through (e) of this section, or is operating the equipment~~ during a training period in accordance with paragraph (f) of this section. Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see Sec. 1926.1436), sideboom cranes (see Sec. 1926.1440), and equipment with a rated hoisting/lifting capacity of 2,000 pounds or less (see Sec. 1926.1441).	(a) The employer must ensure that, prior to operating any equipment covered under subpart CC, the person is operating the equipment during a training period in accordance with paragraph (f) of this section, or the operator is qualified or certified to operate the equipment in accordance with the following: (1) When a non-military government entity issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements of paragraphs (e)(2) and (j) of this section, the equipment operator must either be: (i) licensed by that government entity for operation of equipment within that entity's jurisdiction; or (ii) qualified in compliance with paragraph (d) of this section. (2) Where paragraph (a)(1) of this section is not applicable, the certification or qualification must comply with one of the options in paragraphs (b) through (d) of this section.	(1) Prior to operating any crane covered under chapter 296-155 WAC, Part L, with the exception of the trainee/apprentice requirements outlined in subsection (2) of this section, the employer must ensure that the crane operator:

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	(3) Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see § 1926.1436), sideboom cranes (see § 1926.1440), or equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441). (4) Whenever operator qualification or certification is required under § 1926.1427, the employer must provide the qualification or certification at no cost to operators who are employed by the employer on [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].	(6) Whenever operator qualification or certification is required under this section, the employer must provide the qualification and certification at no cost to operators who are employed by the employer.
(b) Option 1: Certification by an accredited crane/derrick operator testing organization. (1) For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel have been met. (ii) Administer written and practical tests that: (A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (B) Provide different levels of certification based on equipment capacity and type. (iii) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified. (iv) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical	(b) *Option (1): Certification by an accredited crane operator testing organization*. (1) For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel have been met. (ii) Administer written and practical tests that: (A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (B) Provide different levels of certification based on equipment capacity and type. (iii) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified. (iv) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical	(a) Has a valid crane operator certificate, for the type of crane to be operated, issued by a crane operator testing organization accredited by a nationally recognized accrediting agency. The operator certification must include a successful passing of a written and practical examination for each crane category listed in Table 3 and by crane type for mobile cranes. *Notes:* • *An operator's certificate issued by the accredited testing agency is valid for a five-year period, and must be renewed to ensure operators maintain qualified operator status.* • *For self-erecting tower cranes, the department will accept a tower crane certification issued by a nationally accrediting testing agency.* • *For derricks, the department will accept, at a minimum, a lattice boom truck or crawler mobile crane operator's certificate.* • *If there is no accredited written or practical*

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knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years. (2) A certification issued under this option is portable. (3) A certification issued under this paragraph ~~(b)~~ is valid for 5 years.	knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years. (2) An operator will be deemed qualified to operate a particular piece of equipment if the operator is certified under paragraph (b) of this section for that type and capacity of equipment or for higher-capacity equipment of that type. If no accredited testing agency offers certification examinations for a particular type and/or capacity of equipment, an operator will be deemed qualified to operate that equipment if the operator has been certified for the type/capacity that is most similar to that equipment and for which a certification examination is available. The operator's certificate must state the type/capacity of equipment for which the operator is certified. (3) A certification issued under this option is portable and meets the requirements of paragraph (a)(2) of this section. (4) A certification issued under this paragraph is valid for 5 years.	*test for operator certification available, the employer must ensure the operator has been completely trained, evaluated and tested by the employer on the operating procedures for the piece of equipment in use as recommended by the crane equipment manufacturer. This process must be documented and made available upon request.* Not including paragraph (b)(2) because we have similar current language that reads; "(d) If there is no accredited written or practical test for operator certification available, the employer must ensure the operator has been completely trained, evaluated and tested by the employer on the operating procedures for the piece of equipment in use as recommended by the crane equipment manufacturer. This process must be documented and made available upon request."
(c) Option 2: Qualification by an audited employer program. The employer's qualification of its employee shall meet the following requirements: (1) The written and practical tests shall be either: (i) Developed by an accredited crane/derrick operator testing organization (see paragraph (b) of this section), or (ii) Approved by an auditor in accordance with the following requirements: (A) The auditor is certified to evaluate such tests by an	(c) *Option (2): Qualification by an audited employer program*. The employer's qualification of its employee must meet the following requirements: (1) The written and practical tests must be either: (i) Developed by an accredited crane operator testing organization (see paragraph (b) of this section); or (ii) Approved by an auditor in accordance with the following requirements: (A) The auditor is certified to evaluate such tests by an	NO COMPARABLE, MORE RESTRICTIVE

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accredited crane~~/derrick~~ operator testing organization (see paragraph (b) of this section). (B) The auditor is not an employee of the employer. (C) The approval shall be based on the auditor's determination that the written and practical tests meet nationally recognized test development criteria and are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (2) Administration of tests. (i) The written and practical tests shall be administered under circumstances approved by the auditor as meeting nationally recognized test administration standards. (ii) The auditor shall be certified to evaluate the administration of the written and practical tests by an accredited crane~~/derrick~~ operator testing organization (see paragraph (b) of this section). (iii) The auditor shall not be an employee of the employer. (iv) The audit shall be conducted in accordance with nationally recognized auditing standards. (3) The employer program shall be audited within 3 months of the beginning of the program and every 3 years thereafter. (4) The employer program shall have testing procedures for re-qualification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. The re-qualification procedures shall be audited in accordance with paragraphs (c)(1) and (2) of this section. (5) Deficiencies. If the auditor determines that there is a significant deficiency ("deficiency") in the program, the employer shall ensure that:	accredited crane operator testing organization (see paragraph (b) of this section). (B) The auditor is not an employee of the employer. (C) The approval must be based on the auditor's determination that the written and practical tests meet nationally recognized test development criteria and are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (D) The audit must be conducted in accordance with nationally recognized auditing standards. (2) *Administration of tests*. (i) The written and practical tests must be administered under circumstances approved by the auditor as meeting nationally recognized test administration standards. (ii) The auditor must be certified to evaluate the administration of the written and practical tests by an accredited crane operator testing organization (see paragraph (b) of this section). (iii) The auditor must not be an employee of the employer. (iv) The audit must be conducted in accordance with nationally recognized auditing standards. (3) The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter. (4) The employer program must have testing procedures for re-qualification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. The requalification procedures must be audited in accordance with paragraphs (c)(1) and (2) of this section. (5) *Deficiencies*. If the auditor determines that there is a	

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(i) No operator is qualified until the auditor confirms that the deficiency has been corrected. (ii) The program is audited again within 180 days of the confirmation that the deficiency was corrected. (iii) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor's determination that there is a deficiency. (iv) Records of the audits of the employer's program are maintained by the auditor for three years and are made available by the auditor to the Secretary of Labor or her designated representative upon request. (6) A qualification under this paragraph ~~(c)~~ is: (i) Not portable. (ii) Valid for 5 years.	significant deficiency ("deficiency") in the program, the employer must ensure that: (i) No operator is qualified until the auditor confirms that the deficiency has been corrected. (ii) The program is audited again within 180 days of the confirmation that the deficiency was corrected. (iii) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor's determination that there is a deficiency. (iv) Records of the audits of the employer's program are maintained by the auditor for three years and are made available by the auditor to the Secretary of Labor or the Secretary's designated representative upon request. (6) A qualification under this paragraph is: (i) Not portable. Such a qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the qualification. (ii) Valid for 5 years.	
(d) Option 3. Qualification by the U.S. military. (1) For purposes of this section, an operator is considered qualified if he/she has a current operator qualification issued by the U.S. military for operation of the equipment. (2) A qualification under this paragraph ~~(d)~~ is: (i) Not portable. (ii) Valid for the period of time stipulated by the issuing entity.	(d) *Option (3): Qualification by the U.S. military*. (1) For purposes of this section, an operator who is an employee of the U.S. military is considered qualified if he/she has a current operator qualification issued by the U.S. military for operation of the equipment. An employee of the U.S. military is a federal employee of the Department of Defense or Armed Forces and does not include employees of private contractors. (2) A qualification under this paragraph is: (i) Not portable. Such a qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the	NO COMPARABLE, MORE RESTRICTIVE

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	employer that issued the qualification. (ii) Valid for the period of time stipulated by the issuing entity.	
(e) Option 4. Licensing by a government entity. (1) For purposes of this section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane~~/derrick~~ operator testing organization if the criteria in paragraph (e)(2) of this section are met. (2) Licensing criteria. (i) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (ii) The testing meets industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel. (iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i) and (ii) of this section have been met. (iv) The licensing department/office has testing procedures for re-licensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (3) A license issued by a government accredited crane/derrick operator testing organization that meets the requirements of this option: (i) Meets the operator qualification requirements of this section for operation of equipment only within the jurisdiction of the government entity. (ii) Is valid for the period of time stipulated by the licensing	(e) *Option (4): Licensing by a government entity*. (1) For purposes of this section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane operator testing organization if the criteria in paragraph (e)(2) of this section are met. (2) *Licensing criteria*. (i) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (ii) The testing meets industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel. (iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i) and (ii) of this section have been met. (iv) The licensing department/office has testing procedures for relicensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (3) A license issued by a government accredited crane operator testing organization that meets the requirements of this option: (i) Meets the operator qualification requirements of this section for operation of equipment only within the jurisdiction of the government entity. (ii) Is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.	NO COMPARABLE, MORE RESTRICTIVE

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department/office, but no longer than 5 years.		
(f) Pre-qualification/certification training period. ~~(1)~~ An employee who is not qualified or certified under this section is permitted to operate equipment where the requirements of paragraph (f)(2) of this section are met. ~~(2) An employee who has not passed both the written and practical tests required under this section is permitted to operate equipment as part of his/her training where the following requirements are met:~~ (i) The employee ("trainee/apprentice") shall be provided with sufficient training prior to operating the equipment to enable the trainee to operate the equipment safely under limitations established by this section (including continuous supervision) and any additional limitations established by the employer. (ii) The tasks performed by the trainee/apprentice while operating the equipment shall be within the trainee's ability. (iii) Supervisor. While operating the equipment, the trainee/apprentice shall be continuously supervised by an individual ("operator's supervisor") who meets the following requirements: (A) The operator's supervisor is an employee or agent of the trainee's/apprentice's employer. (B) The operator's supervisor is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment's controls. (C) While supervising the trainee/apprentice, the operator's supervisor performs no tasks that detract from the supervisor's ability to supervise the trainee/apprentice. (D) For equipment other than tower cranes: the operator's	(f) *Pre-qualification/certification training period*. An employee who is not qualified or certified under this section is permitted to operate equipment only as an operator- in-training and only where the requirements of this paragraph are met. (1) The employer must provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in-training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer. (2) The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training's ability. (3) *Trainer*. While operating the equipment, the operator-in-training must be continuously monitored by an individual ("operator's trainer") who meets all of the following requirements: (i) The operator's trainer is an employee or agent of the operator-in-training's employer. (ii) The operator's trainer is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment's controls. (iii) While monitoring the operator-in-training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training. (iv) For equipment other than tower cranes: the operator's trainer and the operator-in-training must be in direct line of sight of each other. In addition, they must communicate	WAC 296-155-53300 (2) Prequalification/certification training period. An employee who is not a qualified crane operator as outlined in subsection (1) of this section is permitted to operate the crane as part of his/her training providing the following requirements are met: (a) The employee ("trainee/apprentice") must be provided with sufficient training prior to operating the crane to enable the trainee to operate the crane safely under limitations established by this section (including continuous supervision) and any additional limitations established by the employer. (b) The tasks performed by the trainee/apprentice while operating the crane must be within the trainee's ability, as determined by the supervising qualified crane operator. (c) Qualified crane operator. While operating the equipment, the trainee/apprentice must be continuously supervised by a qualified crane operator who meets the following requirements: (i) The qualified crane operator is an employee or agent of the trainee's/apprentice's employer. (ii) The qualified crane operator under this section is familiar with the proper use of the equipment's controls. (iii) While supervising the trainee/apprentice, the qualified crane operator performs no tasks that detract from the qualified crane operator's ability to supervise the trainee/apprentice. (iv) For cranes other than tower cranes: The qualified crane operator and the trainee/apprentice must be in direct line of sight of each other. In addition, they must communicate verbally or by hand signal.

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supervisor and the trainee/apprentice shall be in direct line of sight of each other. In addition, they shall communicate verbally or by hand signals. For tower cranes: the operator's supervisor and the trainee/apprentice shall be in direct communication with each other. (iv) Continuous supervision. The trainee/apprentice shall be supervised by the operator's supervisor at all times, except for short breaks where the following are met: (A) The break lasts no longer than 15 minutes and there is no more than one break per hour. (B) Immediately prior to the break the operator's supervisor informs the trainee/apprentice of the specific tasks that the trainee/apprentice is to perform and limitations that he/she is to adhere to during the operator supervisor's break. (C) The specific tasks that the trainee/apprentice will perform during the operator supervisor's break are within the trainee's/apprentice's abilities. (v) The trainee/apprentice shall not operate the equipment in any of the following circumstances: (A) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone (see Sec. 1926.1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV. (B) If the equipment is used to hoist personnel. (C) In multiple-equipment lifts. (D) If the equipment is used over a shaft, cofferdam, or in a tank farm. (E) For multiple-lift rigging, except where the operator's supervisor determines that the trainee's/apprentice's skills are sufficient for this high-skill work.	verbally or by hand signals. For tower cranes: the operator's trainer and the operator-in-training must be in direct communication with each other. (4) *Continuous monitoring*. The operator-in-training must be monitored by the operator's trainer at all times, except for short breaks where all of the following are met: (i) The break lasts no longer than 15 minutes and there is no more than one break per hour. (ii) Immediately prior to the break the operator's trainer informs the operator-in-training of the specific tasks that the operator-in-training is to perform and limitations to which he/she must adhere during the operator trainer's break. (iii) The specific tasks that the operator-in-training will perform during the operator trainer's break are within the operator-in-training's abilities. (5) The operator-in-training must not operate the equipment in any of the following circumstances unless the exception stated in paragraph (f)(5)(v) of this section is applicable: (i) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone (see § 1926.1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV. (ii) If the equipment is used to hoist personnel. (iii) In multiple-equipment lifts. (iv) If the equipment is used over a shaft, cofferdam, or in a tank farm. (v) In multiple-lift rigging operations, except where the operator's trainer determines that the operator-in-training skills are sufficient for this high-skill work.	(v) For tower cranes: The qualified crane operator and the trainee/apprentice must be in direct communication with each other. (d) The trainee/apprentice must not operate the crane in any of the following circumstances: (i) If any part of the crane, load line or load (including rigging and lifting accessories), if operated up to the crane's maximum working radius in the work zone, could get within twenty feet of a power line that is up to three hundred fifty kV, or within fifty feet of a power line that is over three hundred fifty kV; (ii) If the crane is used to hoist personnel; (iii) In a multiple-crane lift situation; or (iv) Multiple-lift rigging, as defined in WAC 296-155-52902, can only be accomplished by the trainee/apprentice when the qualified crane operator determines that the trainee's/apprentice's skills are sufficient for this high-skill work. (v) Critical lifts, as defined in WAC 296-155-52902, can only be accomplished by the trainee/apprentice when the qualified crane operator determines that the trainee's/apprentice's skills are sufficient for this high-skill work.

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(g) Under this section, a testing entity is permitted to provide training as well as testing services as long as the criteria of the applicable accrediting agency (in the option selected) for an organization providing both services are met.	(g) Under this section, a testing entity is permitted to provide training as well as testing services as long as the criteria of the applicable accrediting agency (in the option selected) for an organization providing both services are met.	NO COMPARABLE, MORE RESTRICTIVE
(h) ~~Written~~ tests under this section are permitted to be administered verbally, with answers given verbally, where the operator candidate: (1) Passes a written demonstration of literacy relevant to the work. (2) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification.	(h) *Language and Literacy Requirements*. (1) Tests under this section may be administered verbally, with answers given verbally, where the operator candidate: (i) Passes a written demonstration of literacy relevant to the work. (ii) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification. (2) Tests under this section may be administered in any language the operator candidate understands, and the operator's certificate must note the language in which the test was given. The operator is qualified under paragraph (b)(2) of this section to operate equipment that is furnished with materials required by this subpart that are written in the language of the certification. The operator may only operate equipment furnished with such materials.	NO COMPARABLE, MORE RESTRICTIVE
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Certification criteria. Qualifications and certifications must be based, at a minimum, on the following: (1) A determination through a written test that: (i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including the following: (A) The controls and operational/performance characteristics. (B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of	(j) *Certification criteria*. Qualifications and certifications must be based, at a minimum, on the following: (1) A determination through a written test that: (i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including all of the following: (A) The controls and operational/performance characteristics. (B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of	**WAC 296-155-53300** (a) A determination through a written test that: (i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including all of the following: (A) The controls and operational/performance characteristics. (B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.

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configurations of the equipment. (C) Procedures for preventing and responding to power line contact. (D) Technical knowledge similar to the subject matter criteria listed in Appendix E of this subpart applicable to the specific type of equipment the individual will operate. Use of the Appendix E ~~of this subpart criteria~~ meets the requirements of this provision. (E) Technical knowledge applicable to: (1) The suitability of the supporting ground and surface to handle expected loads. (2) Site hazards. (3) Site access. (F) This subpart, including applicable incorporated materials. (ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i) of this section. (2) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following: (i) Ability to recognize, from visual and audible observation, the items listed in Sec. 1926.1412(d) (shift inspection). (ii) Operational and maneuvering skills. (iii) Application of load chart information. (iv) Application of safe shut-down and securing procedures.	configurations of the equipment. (C) Procedures for preventing and responding to power line contact. (D) Technical knowledge similar to the subject matter criteria listed in Appendix C of this subpart applicable to the specific type of equipment the individual will operate. Use of the Appendix C criteria meets the requirements of this provision. (E) Technical knowledge applicable to: *(1)* The suitability of the supporting ground and surface to handle expected loads. *(2)* Site hazards. *(3)* Site access. (F) This subpart, including applicable incorporated materials. (ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i) of this section. (2) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following: (i) Ability to recognize, from visual and auditory observation, the items listed in § 1926.1412(d) (shift inspection). (ii) Operational and maneuvering skills. (iii) Application of load chart information. (iv) Application of safe shut-down and securing procedures.	(C) Procedures for preventing and responding to power line contact. (D) Technical knowledge similar to the subject matter criteria listed in WAC 296-155-56420 of this part applicable to the specific type of equipment the individual will operate. Use of the WAC 296-155-56420 criteria meets the requirements of this provision. (E) Technical knowledge applicable to: (I) The suitability of the supporting ground and surface to handle expected loads. (II) Site hazards. (III) Site access. (F) This part, including applicable incorporated materials. (ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (1)(a)(i) of this section. (b) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following: (i) Ability to recognize, from visual and auditory observation, the items listed in WAC 296-155-53405(2). (ii) Operational and maneuvering skills. (iii) Application of load chart information. (iv) Application of safe shut-down and securing procedures.
(k) Phase-in. (1) As of the effective date of this subpart, until four years after the effective date of the subpart, the following requirements apply:	(k) *Phase-in*. (1) The provisions of this section are applicable [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], except for paragraphs (a)(2)	NO COMPARABLE, MORE RESTRICTIVE

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(i) Operators of equipment covered by this standard are ~~required to be~~ competent to operate the equipment safely. (ii) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employee shall be provided with the necessary training prior to operating the equipment. The employer shall ensure that the operator is evaluated to confirm that he/she understands the information provided in the training. (2) The effective date of paragraphs (a) through (j) and (m) of this section is [4 YEARS AFTER THE EFFECTIVE DATE OF THE FINAL RULE].	and (f) which are applicable [INSERT DATE 4 YEARS AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. (2) When § 1926.1427(a)(1) is not applicable, all of the requirements in paragraphs (k)(2)(i) and (ii) of this section apply until [INSERT DATE 4 YEARS AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]: (i) The employer must ensure that operators of equipment covered by this standard are competent to operate the equipment safely. (ii) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employer must train that employee prior to operating the equipment. The employer must ensure that each operator is evaluated to confirm that he/she understands the information provided in the training.	
~~(l) [Reserved.]~~		
~~(m) Definitions.~~ ~~(1) "Portable." Any employer of an operator with a certification that is portable under this section meets the requirements of paragraph (a) of this section with respect to that operator.~~ ~~(2) "Not portable." Where an operator has a qualification that is not portable under this section, the qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the qualification.~~		
Sec. 1926.1428 Signal person qualifications.	**§ 1926.1428 Signal person qualifications.**	**WAC 296-155-53302 Signal Person Qualifications**
(a) The employer of the signal person shall ensure that each signal person meets the Qualification Requirements (paragraph (c) of this section) prior to giving any signals.	(a) The employer of the signal person must ensure that each signal person meets the Qualification Requirements (paragraph (c) of this section) prior to giving any signals.	(1) ~~The employer of t~~The signal person must ~~ensure that each signal person~~ meet~~s~~ the qualification requirements (subsection (3) of this section) prior to giving any signals.

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This requirement shall be met by using either Option (1) or Option (2) ~~(see paragraphs (a)(1) and (a)(2)~~ of this section). (1) Option (1)--Third party qualified evaluator. The signal person has documentation from a third party qualified evaluator showing that the signal person meets the Qualification Requirements (see paragraph (c) of this section). (2) Option (2)--Employer's qualified evaluator. The employer ~~has its~~ qualified evaluator assess the individual and determine that the individual meets the Qualification Requirements (see paragraph (c) of this section) and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable--other employers are not permitted to use it to meet the requirements of this section. (3) The documentation for whichever option is used shall be available while the signal person is employed by the employer.	This requirement must be met by using either Option (1) or Option (2) of this section. (1) *Option (1) – Third party qualified evaluator*. The signal person has documentation from a third party qualified evaluator (see Qualified Evaluator (third party), § 1926.1401 for definition) showing that the signal person meets the Qualification Requirements (see paragraph (c) of this section). (2) *Option (2) – Employer's qualified evaluator*. The employer's qualified (see Qualified Evaluator (not a third party), § 1926.1401 for definition) evaluator assesses the individual and determines that the individual meets the Qualification Requirements (see paragraph (c) of this section) and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable – other employers are not permitted to use it to meet the requirements of this section. (3) The employer must make the documentation for whichever option is used available at the site while the signal person is employed by the employer. The documentation must specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of paragraph (c) of this section.	This requirement must be met by using either Option (1) or Option (2). (a) Option (1)--Third party qualified evaluator. The signal person has documentation from a third party qualified evaluator showing that the signal person meets the qualification requirements listed in subsection (3) of this section. (b) Option (2)--Employer's qualified evaluator. The employer has its qualified evaluator assess the individual and determine that the individual meets the qualification requirements listed in subsection (3) of this section and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable meaning other employers are not permitted to use this qualification to meet the requirements of this section. (c) The employer must make the documentation for whichever option is used available at the site must be available while the signal person is employed by the employer. The documentation must specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of subsection (3) of this section.
(b) If subsequent actions by the signal person indicate that the individual may not meet the Qualification Requirements (see paragraph (c) of this section), the employer must not allow the individual to continue working as a signal person until retraining is provided and a reassessment is made in accordance with paragraph (a) of this section that confirms that the individual meets the Qualification Requirements.	(b) If subsequent actions by the signal person indicate that the individual does not meet the Qualification Requirements (see paragraph (c) of this section), the employer must not allow the individual to continue working as a signal person until re-training is provided and a re-assessment is made in accordance with paragraph (a) of this section that confirms that the individual meets the Qualification Requirements.	(2) If subsequent actions by the signal person indicate that the individual may not meet the qualification requirements listed in subsection (3) of this section, the employer must not allow the individual to continue working as a signal person until retraining is provided and a reassessment is made in accordance with subsection (1) of this section that confirms that the individual meets the qualification requirements.
(c) Qualification Requirements. Each signal person must:	(c) *Qualification Requirements*. Each signal person must:	(3) Qualification requirements. Each signal person must:

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(1) Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals. (2) Be competent in the application of the type of signals used. (3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads. (4) Know and understand the relevant requirements of Sec. 1926.1419 through Sec. 1926.1422 and Sec. 1926.1428. (5) Demonstrate that he/she meets the requirements in paragraph (c)(1) through (4) of this section through a verbal or written test, and through a practical test.	(1) Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals. (2) Be competent in the application of the type of signals used. (3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads. (4) Know and understand the relevant requirements of § 1926.1419 through § 1926.1422 and § 1926.1428. (5) Demonstrate that he/she meets the requirements in paragraphs (c)(1) through (4) of this section through an oral or written test, and through a practical test.	(a) Know and understand the type of signals used. For example, if hand signals are used, the signal person must know and understand the standard method for hand signals. (b) Be competent in the application of the type of signals used. (c) Have a basic understanding of crane/derrick operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads. (d) Know and understand the relevant requirements of WAC 296-155-53406 and this section. (e) Demonstrate that they meet the requirements in subsection (3)(a) through (d) of this section through an oral or written test, and through a practical test.
		(4) Qualification period. A signal person qualification cannot exceed a five-year period; this qualification must be renewed every five years to ensure signal persons maintain qualified status. Renewals must include the requirements in subsection (1) of this section.
Sec. 1926.1429 Qualifications of maintenance & repair employees.	**§ 1926.1429 Qualifications of maintenance & repair employees.**	**WAC 296-155-53304 Repair, Inspection and Maintenance Employee Qualifications**
(a) Maintenance, inspection and repair personnel are permitted to operate the equipment only where the following requirements are met: (1) The operation is limited to those functions necessary to perform maintenance, inspect or verify the performance ~~of the equipment~~. (2) The personnel either: (i) Operate the equipment under the direct supervision of an operator who meets the requirements of Sec. 1926.1427 (Operator qualification and certification), or (ii) Are familiar with the operation, ~~safe~~ limitations,	(a) Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following requirements are met: (1) The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance. (2) The personnel either: (i) Operate the equipment under the direct supervision of an operator who meets the requirements of § 1926.1427 (Operator qualification and certification); or (ii) Are familiar with the operation, limitations,	(1) Repair, inspection and maintenance personnel are permitted to operate the crane/derrick only where all of the following requirements are met: (a) The operation is limited to those functions necessary to perform maintenance, inspect or verify the performance of the crane/derrick. (b) The personnel either: (i) Operate the crane/derrick under the direct supervision of an operator who meets the requirements of WAC 296-155-53300 (Operator qualification and certification), or (ii) Are familiar with the operation, safe limitations,

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characteristics and hazards associated with the type of equipment.	characteristics and hazards associated with the type of equipment.	characteristics and hazards associated with the type of crane/derrick.
(b) Maintenance and repair personnel shall meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.	(b) Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.	(2) Maintenance and repair personnel must meet the definition of a qualified person with respect to the crane/derrick and maintenance/repair tasks performed.
Sec. 1926.1430 Training.	**§ 1926.1430 Training**.	**WAC 296-155-53409 Training.**
The employer shall provide training as follows:	The employer must provide training as follows:	(1) The employer must provide training as follows:
(a) Overhead powerlines. Employees specified in Sec. 1926.1408(g) (Power line safety; training) shall be trained in accordance with the requirements of that paragraph.	(a) *Overhead powerlines*. The employer must train each employee specified in § 1926.1408(g) and § 1926.1410(m) in the topics listed in § 1926.1408(g).	(a) Overhead powerlines. The employer must train each employee specified in WAC 296-155-53408(2)(g) and WAC 296-155-53408(4)(k) in the topics listed in WAC 296-155-53408(2)(f).
(b) Signal persons. Employees who will be assigned to work as signal persons who do not meet the requirements of Sec. 1926.1428(c) shall be trained in the areas addressed in that paragraph.	(b) *Signal persons*. The employer must train each employee who will be assigned to work as a signal persons who does not meet the requirements of § 1926.1428(c) in the areas addressed in that paragraph.	(b) Signal persons. The employer must train each employee who will be assigned to work as a signal persons who does not meet the requirements of WAC 296-155-53302(3) in the areas addressed in that paragraph.
(c) Operators. (1) Operators who are not qualified or certified under Sec. 1926.1427 shall be trained in the areas addressed in Sec. 1926.1427(j). Retraining shall be provided if necessary for re-qualification or re-certification or if the operator does not pass a qualification or certification test. (2) Operators shall be trained in the following practices: (i) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary. (ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.	(c) *Operators*. (1) *Operators-in-Training for equipment where certification or qualification is required by this subpart*. The employer must train each operator-in-training in the areas addressed in § 1926.1427(j). The employer must provide re-training if the operator-in-training does not pass a qualification or certification test. (2) *Transitional Period*. During the four-year phase-in period for operator certification or qualification, as provided in § 1926.1427(k), employers must train each operator who has not yet been certified or qualified in the areas addressed in § 1926.1427(j). (3) *Operators excepted from the requirements of § 1926.1427*. The employer must train each operator excepted under § 1926.1427(a) from the requirements of § 1926.1427 on the safe operation of the equipment the operator will be using.	(c) Operators. (i) Operators-in-Training for cranes/derricks where certification or qualification is required by this part. The employer must train each operator-in-training in the areas addressed in WAC 296-155-53300 and WAC 296-155-56420. The employer must provide re-training if the operator-in-training does not pass a qualification or certification test. (ii) For operators using equipment that are exempt in WAC 296-155-52900(3) , the employer must train each operator on the safe operation of the equipment the operator will be using. (iii) The employer must train each operator of the equipment covered by this part in the following practices: (A) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist

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	(4) The employer must train each operator of the equipment covered by this subpart in the following practices: (i) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment with a boom, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary. See § 1926.1417(f) and (j) for additional requirements. (ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.	brake needs to be adjusted. On other types of equipment with a boom, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary. See WAC 296-155-53400(69) and (70)for additional requirements. (B) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.
(d) Competent persons and qualified persons. Competent persons and qualified persons shall be trained regarding the requirements of this subpart applicable to their respective roles.	(d) *Competent persons and qualified persons*. The employer must train each competent person and each qualified person regarding the requirements of this subpart applicable to their respective roles.	(d) Competent persons and qualified persons. The employer must train each competent person and each qualified person regarding the requirements of this part applicable to their respective roles.
(e) Crush/pinch points. Employees who work with the equipment shall be instructed to keep clear of holes, and crush/pinch points and the hazards addressed in Sec. 1926.1424 (Work area control).	(e) *Crush/pinch points*. The employer must train each employee who works with the equipment to keep clear of holes, and crush/pinch points and the hazards addressed in § 1926.1424 (Work area control).	(e) Crush/pinch points. The employer must train each employee who works with the equipment to keep clear of holes, and crush/pinch points and the hazards addressed in WAC 296-155-53400(42)(Work area control).
(f) Tag-out. Operators and other employees authorized to start/energize equipment or operate equipment controls (such as maintenance and repair employees), shall be trained in the tag-out procedures in Sec. 1926.1417(f).	(f) *Tag-out*. The employer must train each operator and each additional employee authorized to start/energize equipment or operate equipment controls (such as maintenance and repair employees), in the tag-out and start-up procedures in §§ 1926.1417(f) and (g).	(f) Tag-out. The employer must train each operator and each additional employee authorized to start/energize equipment or operate equipment controls (such as maintenance and repair employees), in the tag-out and start-up procedures in WAC 296-155-53400(17) and (69).
(g) Training administration. (1) The employer shall ensure that employees required to be trained under this subpart are evaluated to confirm that they understand the information provided in the training. (2) Refresher training in relevant topics shall be provided when, based on the conduct of the employee or an	(g) *Training administration*. (1) The employer must evaluate each employee required to be trained under this subpart to confirm that the employee understands the information provided in the training. (2) The employer must provide refresher training in relevant topics for each employee when, based on the conduct of the	(2) Training administration. (a) The employer must evaluate each employee required to be trained under this part to confirm that the employee understands the information provided in the training. (b) The employer must provide refresher training in relevant topics for each employee when, based on the conduct of the

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evaluation of the employee's knowledge, there is an indication that retraining is necessary.	employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary. (3) Whenever training is required under subpart CC, the employer must provide the training at no cost to the employee.	employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary. (c) Whenever training is required under part L, the employer must provide the training at no cost to the employee.
Sec. 1926.1431 Hoisting personnel.	**§ 1926.1431 Hoisting personnel.**	**WAC 296-155-547 Personnel Lifting Platforms (Attached and suspended) – Scope.**
The requirements of this section are supplemental to the other requirements in this subpart and apply when one or more employees are hoisted.	The requirements of this section are supplemental to the other requirements in this subpart and apply when one or more employees are hoisted.	
(a) The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. This paragraph does not apply to work covered by subpart R (Steel Erection) of this part.	(a) The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the work area, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. This paragraph does not apply to work covered by subpart R (Steel Erection) of this part.	(1) This rule applies to the lifting, lowering, and transporting of personnel using personnel platforms connected to cranes or derricks. Personnel platforms can be suspended from the crane or derrick by wire rope, or attached to the boom of the crane or derrick. Using articulating boom cranes with suspended platforms is **not** allowed. The use of attached work platforms to the articulating boom crane must be approved by the crane manufacturer. Cranes and derricks are designed and intended for material handling, and are not required to meet the same design standards as manlifts, aerial lifts, bucket trucks, and other conventional personnel-lifting equipment. The lifting or lowering of personnel using material handling cranes and derricks is prohibited unless all of the applicable requirements of WACs 296-155-547 through 296-155-55305 are met. (2) Cranes or derricks must not be used for personnel lifting when there is a less hazardous way to accomplish the work, such as; manlifts, aerial lifts, bucket trucks, and other conventional personnel-lifting equipment or staging/scaffolding.
(b) Use of personnel platform.	(b) *Use of personnel platform*.	**WAC 296-155-54800 Design of platforms and suspension**

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(1) When using equipment to hoist employees, the employees shall be in a personnel platform that meets the requirements of paragraph (e) of this section.	(1) When using equipment to hoist employees, the employees must be in a personnel platform that meets the requirements of paragraph (e) of this section.	**systems.** (1) Employers that manufacture personnel platforms and/or their suspension systems must be designed, constructed and tested according to ASME B30.23-2005, Personnel Lifting Systems. The design and manufacturer's specifications must be made by a registered professional engineer.
(2) Exceptions: A personnel platform is not required for hoisting employees: (i) Into and out of drill shafts that are up to and including 8 feet in diameter (see paragraph (o) of this section for requirements for hoisting these employees). (ii) In pile driving operations (see paragraph (p) of this section for requirements for hoisting these employees). (iii) Solely for transfer to or from a marine worksite in a marine hoisted personnel transfer device (see paragraph (r) of this section for requirements for hoisting these employees). (iv) In storage tank (steel or concrete), shaft and chimney operations (see paragraph (s) of this section for requirements for hoisting these employees).	(2) *Exceptions*: A personnel platform is not required for hoisting employees: (i) Into and out of drill shafts that are up to and including 8 feet in diameter (see paragraph (o) of this section for requirements for hoisting these employees). (ii) In pile driving operations (see paragraph (p) of this section for requirements for hoisting these employees). (iii) Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device (see paragraph (r) of this section for requirements for hoisting these employees). (iv) In storage-tank (steel or concrete), shaft and chimney operations (see paragraph (s) of this section for requirements for hoisting these employees).	NO COMPARABLE.
(c) Equipment set-up. (1) The equipment shall be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable. (2) Equipment with outriggers shall have them all extended and locked. The amount of extension shall be the same for all outriggers and in accordance with manufacturer procedures and load charts.	(c) *Equipment set-up*. (1) The equipment must be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable. (2) Equipment with outriggers or stabilizers must have them all extended and locked. The amount of extension must be the same for all outriggers and stabilizers and in accordance with manufacturer procedures and load charts.	**WAC 296-155-54900** (5) The crane must be level within one percent of level and located on firm footing and a qualified person must determine that the footing is sufficiently firm and stable. Outriggers or stabilizers must be extended, blocked and locked according to manufacturer's recommendations, if the crane is equipped with them, the amount of the extension must be the same for all outriggers or stabilizers.
(d) Equipment criteria. (1) Capacity: use of suspended personnel platforms. The	(d) *Equipment criteria*. (1) *Capacity: use of suspended personnel platforms*. The	**WAC 296-155-54900** (6) The total weight of the lifted load, including rigging,

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total load (with the platform loaded, including the hook, load line and rigging) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing. (2) Capacity: use of boom-attached personnel platforms. The total weight of the loaded personnel platform shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing). (3) Capacity: hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to paragraph (b)(2) of this section, the total load (including the hook, load line, rigging and any other equipment that imposes a load) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.	total load (with the platform loaded, including the hook, load line and rigging) must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing. (2) *Capacity: use of boom-attached personnel platforms*. The total weight of the loaded personnel platform must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing). (3) *Capacity: hoisting personnel without a personnel platform*. When hoisting personnel without a personnel platform pursuant to paragraph (b)(2) of this section, the total load (including the hook, load line, rigging and any other equipment that imposes a load) must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.	platform, personnel, tools, and material must not exceed **fifty percent** of the crane's rated capacity for the radius and configuration, under the planned conditions of operations (except during testing as outlined in WAC 296-155-551).
(4) When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes shall be engaged.	(4) When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes must be engaged.	**WAC 296-155-54900** (7) When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes must be engaged.
(5) Devices. (i) Equipment (except for derricks) with a variable angle boom shall be equipped with: (A) A boom angle indicator, readily visible to the operator. (B) A boom hoist limiting device.	(5) *Devices*. (i) Equipment (except for derricks and articulating cranes) with a variable angle boom must be equipped with all of the following: (A) A boom angle indicator, readily visible to the operator, and (B) A boom hoist limiting device.	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (c) On cranes and derricks with variable angle booms there is a boom angle indicator that is clearly visible to the operator; (d) Equipped with a boom hoist limiting device;
	(ii) Articulating cranes must be equipped with a properly	**WAC 296-155-54900**

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	functioning automatic overload protection device.	(3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (g) Articulating cranes must be equipped with a properly functioning automatic overload protection device. Using articulating boom cranes with suspended platforms is **not** allowed. The use of attached work platforms to the articulating boom crane must be approved by the crane manufacturer.
(ii) Equipment with a luffing jib shall be equipped with: (A) A jib angle indicator, readily visible to the operator. (B) A jib hoist limiting device.	(iii) Equipment with a luffing jib must be equipped with: (A) A jib angle indicator, readily visible to the operator, and. (B) A jib hoist limiting device.	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (e) Cranes with a luffing jib must be equipped with: (i) A jib angle indicator, readily visible to the operator. (ii) A jib hoist limiting device.
(iii) Equipment with telescoping booms shall be equipped with a device to indicate the boom's extended length clearly to the operator, or shall have measuring marks on the boom.	(iv) Equipment with telescoping booms must be equipped with a device to indicate the boom's extended length clearly to the operator, or must have measuring marks on the boom.	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (f) Cranes with telescoping booms must have a boom length indicator, readable from the operator's station;
(iv) Anti two-block. A device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) shall be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur. Exception: this device is not required when hoisting personnel in pile driving operations. Instead, paragraph (p)(2) of this section specifies how to prevent two-blocking during such operations.	(v) *Anti two-block.* A device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) must be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur. *Exception*: this device is not required when hoisting personnel in pile driving operations. Instead, paragraph (p)(2) of this section specifies how to prevent two-blocking during such operations.	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (b) An operational anti-two-block device or upper travel limit switch is installed on the hoisting systems; **WAC 296-155-55210** (1) Before lifting personnel the following must be met: (b) For crane/derrick that uses wire rope to hoist a personnel platform, verify that the crane/derrick has an anti-two-block device or upper travel limit switch, installed and operational; Also see definition: **Anti two-block device** means a device that, when activated,

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		disengages all crane functions whose movement can cause two-blocking.
(v) Controlled load lowering. The load line hoist drum shall have a system, other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism. This system or device must be used when hoisting personnel. Note ~~to paragraph (d)(2)(v)~~: free fall of the load line hoist is prohibited (see Sec. 1926.1426(d); the use of equipment in which the boom hoist mechanism can free fall is also prohibited (see Sec. 1926.1426(a)(1)).	(vi) *Controlled load lowering*. The load line hoist drum must have a system, other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism. This system or device must be used when hoisting personnel. (NOTE: Free fall of the load line hoist is prohibited (see § 1926.1426(d); the use of equipment in which the boom hoist mechanism can free fall is also prohibited (see § 1926.1426(a)(1).)	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (k) The load line hoist drum must have a system, other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism. This system or device must be used when hoisting personnel.
(vi) Proper operation required. Personnel hoisting operations shall not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator shall safely stop operations. Personnel hoisting operations shall not resume until the device is again working properly. Alternative measures are not permitted.	(vii) *Proper operation required*. Personnel hoisting operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator must safely stop operations. Personnel hoisting operations must not resume until the device is again working properly. Alternative measures are not permitted. (See § 1926.1417 for tag-out and related requirements.)	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (l) Proper operation required. Personnel hoisting operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator must safely stop operations. Personnel hoisting operations must not resume until the device is again working properly. Alternative measures are not permitted.
(6) Direct attachment of a personnel platform to a luffing jib is prohibited.	(6) Direct attachment of a personnel platform to a luffing jib is prohibited.	**WAC 296-155-54900** (3) The crane or derrick being used to hoist the personnel platform must meet the following requirements: (4) Direct attachment of a personnel platform to a luffing jib is prohibited.
(e) Personnel platform criteria. (1) The personnel platform and attachment/suspension system shall be designed for hoisting personnel by a qualified person familiar with structural design.	(e) *Personnel platform criteria*. (1) A qualified person familiar with structural design must design the personnel platform and attachment/suspension system used for hoisting personnel.	**WAC 296-155-54800 Design of platforms and suspension systems.** (1) Employers that manufacture personnel platforms and/or their suspension systems must be designed, constructed and tested according to ASME B30.23-2005, Personnel Lifting Systems. The design and manufacturer's specifications must

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		be made by a registered professional engineer.
(2) The system used to connect the personnel platform to the equipment shall allow the platform to remain within 10 degrees of level, regardless of boom angle.	(2) The system used to connect the personnel platform to the equipment must allow the platform to remain within 10 degrees of level, regardless of boom angle.	**WAC 296-155-54800** The system used to connect the personnel platform to the equipment must allow the platform to remain within 10 degrees of level, regardless of boom angle.
(3) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.	(3) The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform.	**WAC 296-155-54800** (5) The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform.
(4) The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.	(4) The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.	**WAC 296-155-54800** The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.
(5) All welding of the personnel platform and its components shall be performed by a certified welder familiar with the weld grades, types and material specified in the platform design.	(5) All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design.	**WAC 296-155-54800** (8) All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design.
(6) The personnel platform shall be equipped with a guardrail system which meets the requirements of subpart M of this part, and shall be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than 1/2 inch (1.27cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part.	(6) The personnel platform must be equipped with a guardrail system which meets the requirements of subpart M of this part, and must be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than ½ inch (1.27cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part.	**WAC 296-155-54800** (7) The personnel platform must be equipped with a guardrail system which meets the requirements of subpart M of this part, and must be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than ½ inch (1.27cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part.
(7) A grab rail shall be installed inside the entire perimeter of the personnel platform except for access gates/doors.	(7) A grab rail must be installed inside the entire perimeter of the personnel platform except for access gates/doors.	**WAC 296-155-54800** (8) A grab rail must be installed inside the entire perimeter

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		of the personnel platform except for access gates/doors.
(8) Access gates/doors. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) shall: (i) Not swing outward. (ii) Be equipped with a device that prevents accidental opening.	(8) *Access gates/doors*. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must: (i) Not swing outward. If due to the size of the personnel platform, such as a 1-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward. (ii) Be equipped with a device that prevents accidental opening.	**WAC 296-155-54800** (8) Access gates/doors. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must: (a) Not swing outward. If due to the size of the personnel platform, such as a 1-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward. (b) Be equipped with a device that prevents accidental opening.
(9) Headroom shall be sufficient to allow employees to stand upright in the platform.	(9) Headroom must be sufficient to allow employees to stand upright in the platform.	**WAC 296-155-54800** (10) Headroom must be sufficient to allow employees to stand upright in the platform.
(10) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection shall not obscure the view of the operator or platform occupants (such as wire mesh that has up to 1/2 inch openings), unless full protection is necessary.	(10) In addition to the use of hard hats, employees must be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection must not obscure the view of the operator or platform occupants (such as wire mesh that has up to ½ inch openings), unless full protection is necessary.	**WAC 296-155-54800** (11) In addition to the use of hard hats, employees must be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection must not obscure the view of the operator or platform occupants (such as wire mesh that has up to ½ inch openings), unless full protection is necessary.
(11) All edges exposed to employee contact shall be smooth enough to prevent injury.	(11) All edges exposed to employee contact must be smooth enough to prevent injury.	**WAC 296-155-54800** (12) All edges exposed to employee contact must be smooth enough to prevent injury.
(12) The weight of the platform and its rated capacity shall be conspicuously posted on the platform with a plate or other permanent marking.	(12) The weight of the platform and its rated capacity must be conspicuously posted on the platform with a plate or other permanent marking.	**WAC 296-155-54800** (5) The inspection plate must display the following information: (a) Manufacturer's name and address; (b) Platform rating in terms of weight and personnel;

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		(c) Platform identification number; (d) Suspension system description for suspended platforms, or the intended crane/derrick manufacturer identification for boom attached platforms; (e) Weight of the empty platform and its suspension system; (f) Date the platform was manufactured; (g) Certification of compliance to the design, construction, and testing requirements of ASME B30.23-2005, Personnel Lifting Systems; (h) Listing of any unique operational environments for which the platform has been designed.
(f) Personnel platform loading. (1) The personnel platform shall not be loaded in excess of its rated capacity.	(f) *Personnel platform loading*. (1) The personnel platform must not be loaded in excess of its rated capacity.	**WAC 296-155-55300** (7) In order to safely perform the personnel lift, make sure the following are met: (a) The personnel platform is **not** loaded with more than its rated load capacity;
(2) Use. (i) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work. Platforms shall not be used to hoist materials or tools when not hoisting personnel. (ii) Exception: materials and tools to be used during the lift, if secured and distributed in accordance with paragraph (f)(3) of this section may be in the platform for trial lifts.	(2) *Use*. (i) Personnel platforms must be used only for employees, their tools, and the materials necessary to do their work. Platforms must not be used to hoist materials or tools when not hoisting personnel. (ii) *Exception***:** materials and tools to be used during the lift, if secured and distributed in accordance with paragraph (f)(3) of this section may be in the platform for trial lifts.	**WAC 296-155-55300** (4) Personnel platforms must only be used for personnel, their tools, and sufficient material to do their work. They must not be used for solely transporting bulk materials.
(3) Materials and tools shall be: (i) Secured to prevent displacement. (ii) Evenly distributed within the confines of the platform while it is suspended.	(3) Materials and tools must be: (i) Secured to prevent displacement. (ii) Evenly distributed within the confines of the platform while it is suspended.	**WAC 296-155-55300** (7) In order to safely perform the personnel lift, make sure the following are met: (b) Materials and tools being lifted by a platform are: (i) Secured to prevent movement; (ii) Evenly distributed on the platform.
(4) The number of employees occupying the personnel platform shall not exceed the maximum number the	(4) The number of employees occupying the personnel platform must not exceed the maximum number the	**WAC 296-155-55300** (5) The number of employees occupying the personnel

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platform was designed to hold or the number required to perform the work, whichever is less.	platform was designed to hold or the number required to perform the work, whichever is less.	platform must not exceed the maximum number the platform was designed to hold or the number required to perform the work, whichever is less.
(g) Attachment and rigging. (1) Hooks and other detachable devices. (i) Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) shall be: (A) Of a type that can be closed and locked, eliminating the throat opening. (B) Closed and locked when attached. (ii) Shackles used in place of hooks must be of the alloy anchor type, with either: (A) A bolt, nut and retaining pin, in place, or (B) Of the screw type, with the screw pin secured from accidental removal. (iii) Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in paragraphs (g)(1)(i) and (ii) of this section. Such devices must be closed and locked when attached.	(g) *Attachment and rigging*. (1) *Hooks and other detachable devices*. (i) Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be: (A) Of a type that can be closed and locked, eliminating the throat opening. (B) Closed and locked when attached. (ii) Shackles used in place of hooks must be of the alloy anchor type, with either: (A) A bolt, nut and retaining pin, in place; or (B) Of the screw type, with the screw pin secured from accidental removal. (iii) Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in paragraphs (g)(1)(i) and (ii) of this section. Such devices must be closed and locked when attached.	**WAC 296-155-54800** (15) For suspended platforms, the suspension system must be sized by the platform manufacturer, and its installed sling angle established, so as not to cause damage to the platform. Suspension systems must comply with the following: (a) Hooks and other detachable devices. (i) Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be: (A) Of a type that can be closed and locked, eliminating the throat opening. (B) Closed and locked when attached. (ii) Shackles used in place of hooks must be of the alloy anchor type, with either: (A) A bolt, nut and retaining pin, in place, or (B) Of the screw type, with the screw pin secured from accidental removal. (iii) Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in subsection (15)(a) of this section. Such devices must be closed and locked when attached.
(2) Rope bridle. When a rope bridle is used to suspend the personnel platform, each bridle leg shall be connected to a master link or shackle (see paragraph (g) of this section) in a manner that ensures that the load is evenly divided among the bridle legs.	(2) *Rope bridle*. When a rope bridle is used to suspend the personnel platform, each bridle leg must be connected to a master link or shackle (see paragraph (g)(1) of this section) in a manner that ensures that the load is evenly divided among the bridle legs.	**WAC 296-155-54800** (15) For suspended platforms, the suspension system must be sized by the platform manufacturer, and its installed sling angle established, so as not to cause damage to the platform. Suspension systems must comply with the following: (b) When a rope bridle is used to suspend the personnel

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		platform, each bridle leg must be connected to a master link or shackle (see paragraph (g)(1) of this section) in a manner that ensures that the load is evenly divided among the bridle legs.
(3) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load.	(3) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings must be capable of supporting without failure at least ten times the maximum intended load.	**WAC 296-155-54800** (i) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. A sling made from rotation resistant rope is prohibited.
(4) Eyes in wire rope slings shall be fabricated with thimbles.	(4) Eyes in wire rope slings must be fabricated with thimbles.	**WAC 296-155-54800** (15) For suspended platforms, the suspension system must be sized by the platform manufacturer, and its installed sling angle established, so as not to cause damage to the platform. Suspension systems must comply with the following: (c) Eyes in wire rope slings shall be fabricated with thimbles
(5) Bridles and associated rigging for suspending the personnel platform shall be used only for the platform and the necessary employees, their tools and materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.	(5) Bridles and associated rigging for suspending the personnel platform must be used only for the platform and the necessary employees, their tools and materials necessary to do their work. The bridles and associated rigging must not have been used for any purpose other than hoisting personnel.	**WAC 296-155-54800** (15) For suspended platforms, the suspension system must be sized by the platform manufacturer, and its installed sling angle established, so as not to cause damage to the platform. Suspension systems must comply with the following: (j) Bridles and associated rigging for suspending the personnel platform must be used only for the platform and the necessary employees, their tools and materials necessary to do their work, and must not be used for any other purpose when not hoisting personnel.
(h) Trial lift and inspection. (1) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the	(h) *Trial lift and inspection*. (1) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight must be made from ground level, or any other location where employees will enter the platform, to each location at which the	**WAC 296-155-55115** (2) A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift-weight must be made from ground level, or any other location where employees will enter the platform, to each location at which the

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platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift for all locations, shall be performed.	platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel.	platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel.
(2) The trial lift shall be performed immediately prior to each shift in which personnel will be hoisted. In addition, the trial lift shall be repeated prior to hoisting employees in each of the following circumstances: (i) The equipment is moved and set up in a new location or returned to a previously used location. (ii) The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety.	(2) The trial lift must be performed immediately prior to each shift in which personnel will be hoisted. In addition, the trial lift must be repeated prior to hoisting employees in each of the following circumstances: (i) The equipment is moved and set up in a new location or returned to a previously used location. (ii) The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety.	**WAC 296-155-55115** (1) A trial lift must be performed with the personnel platform, on each shift before lifting personnel, to check the following: (a) Crane/derrick setup and configuration is correct; (b) Load capacities are adequate; (c) No hazardous interferences exist; (d) The operator's operational competence. (3) The trial lift must be repeated before lifting personnel whenever: (a) The crane or derrick is moved and set up in a different location or returned to a previously used location; (b) The crane or derrick is reconfigured; (c) The operator is changed. (d) The lift route has changed, unless the competent person determines that the new route presents no new factors affecting safety.
(3) The competent person shall determine that: (i) Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of Sec. 1926.1415 and Sec. 1926.1416. (ii) Nothing interferes with the equipment or the personnel platform in the course of the trial lift. (iii) The lift will not exceed 50 percent of the equipment's	(3) The competent person must determine that: (i) Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of § 1926.1415 and § 1926.1416. (ii) Nothing interferes with the equipment or the personnel platform in the course of the trial lift. (iii) The lift will not exceed 50 percent of the equipment's	**WAC 296-155-55115** (4) A competent person must determine that: (a) Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of WAC 296-155-53410 and WAC 296-155-53412. (b) Nothing interferes with the crane/derrick or the personnel platform in the course of the trial lift.

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rated capacity at any time during the lift. (iv) The load radius to be used during the lift has been accurately determined.	rated capacity at any time during the lift. (iv) The load radius to be used during the lift has been accurately determined.	(c) The lift will not exceed 50 percent of the crane/derrick's rated capacity at any time during the lift. (d) The load radius to be used during the lift has been accurately determined.
(4) Immediately after the trial lift, the competent person shall: (i) Conduct a visual inspection of the equipment, base support or ground, and personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect. (ii) Confirm that, upon the completion of the trial lift process, the test weight has been removed.	(4) Immediately after the trial lift, the competent person must: (i) Conduct a visual inspection of the equipment, base support or ground, and personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect. (ii) Confirm that, upon the completion of the trial lift process, the test weight has been removed.	**WAC 296-155-55115** (5) Immediately after the trial lift, a competent person must: (a) Conduct a visual inspection of the crane/derrick, base support or ground, and personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect. (b) Confirm that, upon the completion of the trial lift process, the test weight has been removed.
(5) Immediately prior to each lift: (i) The platform shall be hoisted a few inches and inspected by a competent person to ensure that it is secure and properly balanced. (ii) The following conditions must be determined by a competent person to exist before the lift of personnel proceeds: (A) Hoist ropes shall be free of deficiencies in accordance with Sec. 1926.1413(a). (B) Multiple part lines shall not be twisted around each other. (C) The primary attachment shall be centered over the platform. (D) If the load rope is slack, the hoisting system shall be inspected to ensure that all ropes are properly seated on drums and in sheaves.	(5) Immediately prior to each lift: (i) The platform must be hoisted a few inches with the personnel and materials/tools on board and inspected by a competent person to ensure that it is secure and properly balanced. (ii) The following conditions must be determined by a competent person to exist before the lift of personnel proceeds: (A) Hoist ropes must be free of deficiencies in accordance with § 1926.1413(a). (B) Multiple part lines must not be twisted around each other. (C) The primary attachment must be centered over the platform. (D) If the load rope is slack, the hoisting system must be inspected to ensure that all ropes are properly seated on drums and in sheaves.	**WAC 296-155-55115** (6) Immediately prior to each lift: (a) The platform must be hoisted a few inches and inspected by a competent person to ensure that it is secure and properly balanced. (b) The following conditions must be determined by a competent person to exist before the lift of personnel proceeds: (i) Hoist ropes must be free of deficiencies in accordance with WAC 296-155-53404. (ii) Multiple part lines must not be twisted around each other. (iii) The primary attachment must be centered over the platform. (iv) If the load rope is slack, the hoisting system must be inspected to ensure that all ropes are properly seated on drums and in sheaves.
(6) Any condition found during the trial lift and subsequent inspection(s) that fails to meet a requirement of this standard	(6) Any condition found during the trial lift and subsequent inspection(s) that fails to meet a requirement of this standard	**WAC 296-155-55115** (7) Any condition found during the trial lift and subsequent

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or otherwise creates a safety hazard shall be corrected before hoisting personnel.	or otherwise creates a safety hazard must be corrected before hoisting personnel. (See § 1926.1417 for tag-out and related requirements.)	inspection(s) that fails to meet a requirement of this standard or otherwise creates a safety hazard must be corrected before hoisting personnel.
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Proof testing. (1) At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift.	(j) *Proof testing*. (1) At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must be proof tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift.	**WAC 296-155-55110 Proof load test platforms and rigging.** (1) The platform and rigging must be proof load tested at each new job site and after any repair or modification before lifting personnel. This may be done at the same time as the trial lift. (a) Test as follows: (i) Test to 125% of the platform's rated capacity.
(2) The platform shall be lowered by controlled load lowering, braked, and held in a suspended position for a minimum of five minutes with the test load evenly distributed on the platform.	(2) The platform must be lowered by controlled load lowering, braked, and held in a suspended position for a minimum of five minutes with the test load evenly distributed on the platform. .	**WAC 296-155-55110 Proof load test platforms and rigging.** (1) The platform and rigging must be proof load tested at each new job site and after any repair or modification before lifting personnel. This may be done at the same time as the trial lift. (ii) The platform must be lowered by controlled load lowering, braked, and held in a suspended position for a minimum of five minutes with the test load evenly distributed on the platform.
(3) After proof testing, a competent person shall inspect the platform and rigging to determine if the test has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging shall not be used to hoist personnel unless the deficiencies are corrected, the test is repeated, and a competent person determines that the test has been passed.	(3) After proof testing, a competent person must inspect the platform and rigging to determine if the test has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging must not be used to hoist personnel unless the deficiencies are corrected, the test is repeated, and a competent person determines that the test has been passed. (See § 1926.1417 for tag-out and related requirements.)	**WAC 296-155-55110 Proof load test platforms and rigging.** (1) The platform and rigging must be proof load tested at each new job site before lifting personnel. This may be done at the same time as the trial lift. (b) Do the following after proof load testing: (i) A qualified person must inspect the platform and rigging to determine if the test has passed. (ii) Any deficiencies that pose a safety hazard must be corrected prior to lifting personnel.

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		(iii) Another test must be performed after any deficiencies are corrected. (2) The platform and rigging must be proof load tested after any structural repair or modification, before lifting personnel. (a) Test suspended platforms in the following order: (i) Test to 150% of the platform's rated capacity; (ii) The loaded platform must be raised, then lower it at a speed of at least 100 ft/min; (iii) Bring the platform to a stop by using the crane/derrick brakes; (iv) The platform must hang for at least five minutes; (v) A qualified person must inspect the platform and rigging; (vi) Any deficiencies must be corrected; (vii) Another test must be performed after any deficiencies are corrected. (b) Test attached platforms in the following order: (i) Test to 125% of the platform's rated capacity; (ii) Hold the platform suspended for five minutes with the test load evenly distributed on the platform; (iii) A qualified person must inspect the platform and rigging; (iv) Any deficiencies must be corrected; (v) Another test must be performed after any deficiencies are corrected.
(4) Personnel hoisting shall not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.	(4) Personnel hoisting must not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test	**WAC 296-155-55110 Proof load test platforms and rigging.** (1) The platform and rigging must be proof load tested at each new job site and after any repair or modification before lifting personnel. This may be done at the same time as the trial lift.

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		(d) Personnel hoisting must not be conducted until the qualified person determines that the platform and rigging have successfully passed the proof test.
(k) Work practices. (1) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform.	(k) *Work practices*. (1) Hoisting of the personnel platform must be performed in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform.	**WAC 296-155-55210** (1) Before lifting personnel the following must be met: (f) Perform all movements of the platform or crane/derrick in a slow, controlled manner to minimize sudden movement of the platform.
(2) Platform occupants shall: (i) Keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person. (ii) Not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height. (iii) Not pull the platform out of plumb in relation to the hoisting equipment.	(2) Platform occupants must: (i) Keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person. (ii) Not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height. (iii) Not pull the platform out of plumb in relation to the hoisting equipment.	**WAC 296-155-55300** (14) Platform occupants must keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person. (14) Platform occupants must not stand, sit on, or work from the top rail, intermediate rail, toe board, or use any other device to enhance their vertical height working capability. (15) Platform occupants must not pull the platform out of plumb in relation to the crane/derrick.
(3) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure would create a greater hazard.	(3) Before employees exit or enter a hoisted personnel platform that is not landed, the platform must be secured to the structure where the work is to be performed, unless the employer can demonstrate that securing to the structure would create a greater hazard.	**WAC 296-155-55300** (17) Platform occupants must not enter or exit a suspended platform while it is raised unless the platform has an installed gate and is physically secured to the structure to which the occupants are entering or exiting unless the employer can demonstrate that securing to the structure would create a greater hazard.
(4) If the platform is tied to the structure, the operator shall not move the platform until the operator receives confirmation that it is freely suspended.	(4) If the platform is tied to the structure, the operator must not move the platform until the operator receives confirmation that it is freely suspended.	**WAC 296-155-55300** (19) If the platform is tied to the structure, the operator must not move the platform until the operator receives confirmation that it is freely suspended.
(5) Tag lines shall be used when necessary to control the	(5) Tag lines must be used when necessary to control the	**WAC 296-155-55300**

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platform.	platform.	(7) In order to safely perform the personnel lift, make sure the following are met: (d) Tag lines are used to control the motion of suspended platforms, unless using them creates a hazard;
(6) Platforms without controls. Where the platform is not equipped with controls, the equipment operator shall remain at the equipment controls at all times while the platform is occupied.	(6) *Platforms without controls*. Where the platform is not equipped with controls, the equipment operator must remain at the equipment controls, on site, and in view of the equipment, at all times while the platform is occupied.	**WAC 296-155-55210** (1) Before lifting personnel the following must be met: (h) In the case of suspended or boom-mounted platforms, without controls, the operator must remain at the crane/derrick controls at all times when the platform is occupied.
(7) Platforms with controls. Where the platform is equipped with controls, the following must be met at all times while the platform is occupied: (i) The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation. (ii) The equipment operator must be at the equipment controls, or in the personnel platform, or on site and in view of the equipment. (iii) The platform operating manual must be in the platform or on the equipment.	(7) *Platforms with controls*. Where the platform is equipped with controls, all of the following must be met at all times while the platform is occupied: (i) The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation. (ii) The equipment operator must be at a set of equipment controls that include boom and swing functions of the equipment, and must be on site and in view of the equipment. (iii) The platform operating manual must be in the platform or on the equipment.	**WAC 296-155-55210** (1) Before lifting personnel all of the following must be met: (j) Platforms with controls. Where the platform is equipped with controls, all of the following must be met at all times while the platform is occupied: (i) The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the crane/derrick and hazards associated with its operation. See WAC 296-155-53300 for Operator Qualifications and Certification. (ii) The crane/derrick operator must be at a set of crane controls that include boom and swing functions of the crane, or on site and in view of the crane/derrick and platform. (iii) The platform operating manual must be in the platform or on the crane/derrick. **Note:** If lowering, retracting, and rotating primary power source becomes inoperative, the operator is allowed to leave the controls.
(8) Environmental conditions.	(8) *Environmental conditions*.	**WAC 296-155-55300**

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(i) Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person shall determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation shall not begin (or, if already in progress, shall be terminated). (ii) Other weather and environmental conditions. A qualified person shall determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation shall not begin (or, if already in progress, shall be terminated).	(i) *Wind*. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person must determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated). (ii) *Other weather and environmental conditions*. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).	(1) Conditions must provide clear visibility. When conditions such as darkness, fog, or snow prevent clear visibility, a personnel lift must not be performed. (2) Personnel platforms cannot be used in winds in excess of twenty mph (32.2 km/hr) or in electric storms, snow, ice, sleet, or other adverse weather conditions which could affect the safety of personnel. (3) Other weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).
(9) Employees being hoisted shall remain in direct communication with the signal person (where used), or the operator.	(9) Employees being hoisted must remain in direct communication with the signal person (where used), or the operator.	**WAC 296-155-55300** (11) Platform occupants must remain in continuous sight or in communication with the operator and in sight and communication of a signalperson.
(10) Fall protection. (i) Except over water, employees occupying the personnel platform shall be provided and use a personal fall arrest system. The system shall be attached to a structural member within the personnel platform. (ii) The fall arrest system, including the attachment point (anchorage) used to comply with paragraph ~~(k)(10)~~(i) of this section, shall meet the requirements in Sec. 1926.502. Note to paragraph (k)(10): When working over or near water, the requirements of Sec. 1926.106 apply.	(10) *Fall protection*. (i) Except over water, employees occupying the personnel platform must be provided and use a personal fall arrest system. The system must be attached to a structural member within the personnel platform. When working over or near water, the requirements of § 1926.106 apply. (ii) The fall arrest system, including the attachment point (anchorage) used to comply with paragraph (i) of this section, must meet the requirements in § 1926.502.	**WAC 296-155-55300** (5) A qualified person must evaluate the safety concerns of the operational environment and verify the platform and crane/derrick are suitable for use. Additionally, special work circumstances may require further precautions. Precautions such as, but not limited to, the following must be taken: (c) Personnel fall protection devices with quick release features must be provided and required to be worn. The fall protection device must be appropriately attached while personnel are lifted over land and detached while personnel are lifted over water. See Part C-1 of this chapter for requirements for fall arrest system, including the attachment point (anchorage) used to comply with this subsection. When personnel lifts are conducted over water, U.S. Coast Guard approved (Type I, II, III, or V) personnel flotation

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		devices must be provided and required to be worn.
(11) Other load lines. (i) No lifts shall be made on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations. (ii) Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment: Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the rated capacity of the winch and platform.	(11) *Other load lines*. (i) No lifts must be made on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations. (ii) *Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment*. Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the rated capacity of the winch and platform.	**WAC 296-155-55210** (1) Before lifting personnel the following must be met: (n) Not lift any other loads, on any other load lines, while conducting a personnel lift. When the crane/derrick has a boom-attached platform without controls, it must not be used for other lifting service. (o) Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment: Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the rated capacity of the winch and platform, and does not exceed 50 percent of the crane's rated capacity at the radius and configuration used. **WAC 296-155-55300** (7) In order to safely perform the personnel lift, make sure the following are met: (f) No other load lines on the crane or derrick are used to lift anything while personnel are on a platform;
(12) Traveling--equipment other than derricks. (i) Hoisting of employees while the equipment is traveling is prohibited, except for: (A) Equipment that travels on fixed rails, or (B) Where the employer demonstrates that there is no less hazardous way to perform the work. (C) This exception does not apply to rubber-tired equipment. (ii) Where employees are hoisted while the equipment is traveling, the following criteria shall be met: (A) Equipment travel shall be restricted to a fixed track or runway.	(12) *Traveling – equipment other than derricks*. (i) Hoisting of employees while the equipment is traveling is prohibited, except for: (A) Equipment that travels on fixed rails; or (B) Where the employer demonstrates that there is no less hazardous way to perform the work. (C) This exception does not apply to rubber-tired equipment. (ii) Where employees are hoisted while the equipment is traveling, all of the following criteria must be met: (A) Equipment travel must be restricted to a fixed track or runway.	**WAC 296-155-55300** (9) Traveling. (a) Rubber tired cranes are not allowed to travel while lifting personnel. Hoisting of employees while the crane is traveling is only allowed when: ((i) The crane travels on fixed rails; or (ii) The crane has crawlers and is on a runway, and the employer demonstrates that there is no less hazardous way to perform the work. (b) Where employees are hoisted while the crane is traveling, the following criteria must be met: (i) Crane travel must be restricted to a fixed track or

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
(B) Where a runway is used, it shall be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the equipment being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria. (C) Travel shall be limited to boom length. (D) The boom shall be parallel to the direction of travel, except where it is safer to do otherwise. (E) A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by paragraph (h) of this section which tests the lift route.	(B) Where a runway is used, it must be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the equipment being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria. (C) Equipment travel must be limited to boom length. (D) The boom must be parallel to the direction of travel, except where it is safer to do otherwise. (E) A complete trial run must be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by paragraph (h) of this section which tests the lift route.	runway. (ii) Where a runway is used, it must be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane/derrick being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria. (iii) Travel must be limited to boom length. (iv) The boom must be parallel to the direction of travel, except where it is safer to do otherwise. (v) A complete trial run must be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by WAC 296-155-55115 which tests the lift route.
(13) Traveling--derricks. Derricks are prohibited from traveling while personnel are hoisted.	(13) *Traveling – derricks*. Derricks are prohibited from traveling while personnel are hoisted.	**WAC 296-155-55300** (10) Derricks are prohibited from traveling while personnel are hoisted.
(l) [Reserved.]	(l) [*Reserved.*]	
(m) Pre-lift meeting. A pre-lift meeting shall be: (1) Held to review the applicable requirements of this section and the procedures that will be followed. (2) Attended by the equipment operator, signal person (if used for the lift), employees to be hoisted, and the person responsible for the task to be performed. (3) Held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.	(m) *Pre-lift meeting*. A pre-lift meeting must be: (1) Held to review the applicable requirements of this section and the procedures that will be followed. (2) Attended by the equipment operator, signal person (if used for the lift), employees to be hoisted, and the person responsible for the task to be performed. (3) Held prior to the trial lift at each new work location, and must be repeated for any employees newly assigned to the operation.	**WAC 296-155-55200** (2) The employer must: (g) Hold the pre-lift meeting prior to the trial lift at each new work location; (j) Require that all personnel associated with the lift receive the briefings and safety indoctrinations specified in this part. This pre-lift meeting must be attended by the crane/derrick operator, signal person (if used for the lift), employees to be hoisted, personnel lift supervisor and the person responsible for the task to be performed. (3) The pre-lift meeting must cover, as a minimum: (a) The requirements of the applicable portions of Part L in this chapter ; (b) Assignment and responsibilities of each person involved

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		in the lift operation; (c) The procedures to be followed; (d) Guidance on general and specific safety precautions; (e) Special signals for the operation; (f) Unique considerations of the lift; (g) Work to be accomplished during lift; (h) If applicable, the responsibilities and assignments contained in Figure (Appendix I) and Table XX, when lifting personnel near electrical power lines. (4) If individuals are changed during a series of personnel lifts, each new person must be appropriately briefed by the employer.
(n) Hoisting personnel near power lines. Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by subpart V of this part (Power Transmission and Distribution).	(n) *Hoisting personnel near power lines*. Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by subpart V of this part (Power Transmission and Distribution).	**WAC 296-155-55305** (3) **Condition B.** The following steps must be taken when lifting personnel in a Condition B situation: (b) Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by chapter 296-45 WAC, Safety Standards for Electrical Workers and performed by qualified personnel..
(o) Hoisting personnel in drill shafts. When hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, the following requirements shall be met: (1) The employee shall be in either a personnel platform or on a boatswain's chair. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m),	(o) *Hoisting personnel in drill shafts*. When hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements must be met: (1) The employee must be in either a personnel platform or on a boatswain's chair. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m),	WE WILL ADDRESS THIS SECTION DURING THE STAKEHOLDER MEETING EITHER IN OCTOBER OR THE SUBSEQUENT MEETING. 9-14-10

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(n). Where the terms "personnel platform" or "platform" are used in these paragraphs, the term "boatswain's chair" applies in their place. (ii) A signal person shall be stationed at the shaft opening. (iii) The employee shall be hoisted in a slow, controlled descent and ascent. (iv) The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick. (v) The fall protection equipment shall meet the applicable requirements in Sec. 1926.502. (vi) The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vii) No more than one person shall be hoisted at a time.	(n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswain's chair." (ii) A signal person must be stationed at the shaft opening. (iii) The employee must be hoisted in a slow, controlled descent and ascent. (iv) The employee must use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick. (v) The fall protection equipment must meet the applicable requirements in § 1926.502. (vi) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vii) No more than one person must be hoisted at a time.	
(p) Hoisting personnel for pile driving operations. When hoisting an employee in pile driving operations, the following requirements shall be met: (1) The employee shall be in a personnel platform or boatswain's chair. (2) For lattice boom cranes: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. For telescopic boom cranes: Clearly mark the cable (so that it can be easily seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter. (3) If using a personnel platform, paragraphs (b) through (n) of this section apply. (4) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c),	(p) *Hoisting personnel for pile driving operations*. When hoisting an employee in pile driving operations, the following requirements must be met: (1) The employee must be in a personnel platform or boatswain's chair. (2) For lattice boom cranes: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. For telescopic boom cranes: Clearly mark the cable (so that it can be easily seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	WE WILL ADDRESS THIS SECTION DURING THE STAKEHOLDER MEETING EITHER IN OCTOBER OR THE SUBSEQUENT MEETING. 9-14-10

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(d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (j), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, the term "boatswain's chair" applies in their place. (ii) The employee shall be hoisted in a slow, controlled descent and ascent. (iii) The employee shall use personal fall protection equipment, including a full body harness, independently attached to the lower load block or overhaul ball. (iv) The fall protection equipment shall meet the applicable requirements in Sec. 1926.502.	(3) If using a personnel platform, paragraphs (b) through (n) of this section apply. (4) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (j), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswains chair." (ii) The employee must be hoisted in a slow, controlled descent and ascent. (iii) The employee must use personal fall protection equipment, including a full body harness, independently attached to the lower load block or overhaul ball. (iv) The fall protection equipment must meet the applicable requirements in § 1926.502. (v) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vi) No more than one person must be hoisted at a time.	
(q) [Reserved.]	(q) [*Reserved*.]	
(r) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements shall be met: (1) The employee shall be in either a personnel platform or a marine hoisted personnel transfer device. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a marine hoisted personnel transfer device: (i) The following paragraphs of this section apply: (a), (c)(2), (d)(1), (d)(3), (d)(4), (e)(1) through (5), (e)(12),	(r) *Hoisting personnel for marine transfer*. When hoisting employees solely for transfer to or from a marine worksite, the following requirements must be met: (1) The employee must be in either a personnel platform or a marine-hoisted personnel transfer device. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a marine-hoisted personnel transfer device: (i) The following paragraphs of this section apply: (a), (c)(2), (d)(1), (d)(3), (d)(4), (e)(1) through (5), (e)(12),	WE WILL ADDRESS THIS SECTION DURING THE STAKEHOLDER MEETING EITHER IN OCTOBER OR THE SUBSEQUENT MEETING. 9-14-10

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(f)(1), (g), (h), (j), (k)(1), (k)(8), (k)(9), (k)(10)(ii), (k)(11)(i), (k)(12), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, the term "marine hoisted personnel transfer device" applies in their place. (ii) The transfer device shall be used only for transferring workers. (iii) The number of workers occupying the transfer device shall not exceed the maximum number it was designed to hold. (iv) Each employee shall wear a U.S. Coast Guard personal flotation device approved for industrial use.	(f)(1), (g), (h), (j), (k)(1), (k)(8), (k)(9), (k)(10)(ii), (k)(11)(i), (k)(12), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "marine-hoisted personnel transfer device." (ii) The transfer device must be used only for transferring workers. (iii) The number of workers occupying the transfer device must not exceed the maximum number it was designed to hold. (iv) Each employee must wear a U.S. Coast Guard personal flotation device approved for industrial use.	
(s) Hoisting personnel for storage tank (steel or concrete), shaft and chimney operations. When hoisting an employee in storage tank (steel or concrete), shaft and chimney operations, the following requirements shall be met: (1) The employee shall be in a personnel platform except where use of a personnel platform is infeasible; in such a case, a boatswain's chair shall be used. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, the term "boatswain's chair" applies in their place. (ii) The employee shall be hoisted in a slow, controlled descent and ascent. (iii) The employee shall use personal fall protection equipment, including a full body harness, attached	(s) *Hoisting personnel for storage-tank (steel or concrete), shaft and chimney operations*. When hoisting an employee in storage tank (steel or concrete), shaft and chimney operations, the following requirements must be met: (1) The employee must be in a personnel platform except when the employer can demonstrate that use of a personnel platform is infeasible; in such a case, a boatswain's chair must be used. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswains chair." (ii) The employee must be hoisted in a slow, controlled descent and ascent. (iii) The employee must use personal fall protection	WE WILL ADDRESS THIS SECTION DURING THE STAKEHOLDER MEETING EITHER IN OCTOBER OR THE SUBSEQUENT MEETING. 9-14-10

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independent of the crane/derrick. (iv) The fall protection equipment shall meet the applicable requirements in Sec. 1926.502. (v) The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vi) No more than one person shall be hoisted at a time.	equipment, including a full body harness, attached independent of the crane/derrick. When there is no adequate structure for attachment of personal fall arrest equipment as required in § 1926.502(d)(15), the attachment must be to the lower load block or overhaul ball. (iv) The fall protection equipment must meet the applicable requirements in § 1926.502. (v) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vi) No more than one person must be hoisted at a time.	
Sec. 1926.1432 Multiple-crane/derrick lifts--supplemental requirements.	**§ 1926.1432 Multiple-crane/derrick lifts -- supplemental requirements.**	**WAC 296-155-53400 General Requirements.**
(a) Plan development. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be planned. The planning must meet the following requirements: (1) The plan must be developed by a qualified person. (2) The plan must be designed to ensure that the requirements of this subpart are met. (3) Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided.	(a) *Plan development*. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be planned. The planning must meet the following requirements: (1) The plan must be developed by a qualified person. (2) The plan must be designed to ensure that the requirements of this subpart are met. (3) Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided.	**WAC 296-155-53400(41)** (41) Multiple crane lifts (a) *Plan development.* Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be planned. The planning must meet the following requirements: (i) The plan must be developed by a qualified person. (ii) The plan must be designed to ensure that the requirements of this part are met. (iii) Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided.
(b) Plan implementation. (1) The multiple-crane/derrick lift must be supervised by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons. (2) The supervisor must review the plan with all workers	(b) *Plan implementation*. (1) The multiple-crane/derrick lift must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (lift director). (2) The lift director must review the plan in a meeting with	(b) *Plan implementation.* (i) The multiple-crane/derrick lift must be director by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (lift director). (ii) The lift director must review the plan in a meeting with

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who will be involved with the operation.	all workers who will be involved with the operation.	all workers who will be involved with the operation.
Sec. 1926.1433 Design, construction and testing.	**§ 1926.1433 Design, construction and testing.**	
The following requirements apply to equipment that has a manufacturer-rated hoisting/lifting capacity of more than 2,000 pounds.	The following requirements apply to equipment that has a manufacturer-rated hoisting/lifting capacity of more than 2,000 pounds.	
(a) Crawler, truck and locomotive cranes manufactured prior to [EFFECTIVE DATE OF THE FINAL RULE] shall meet the applicable requirements for design, construction, and testing as prescribed in ANSI B30.5-1968, "Crawler, Locomotive, and Truck Cranes," "PCSA Standard No. 2," the requirements in paragraph (b) of this section, or the applicable DIN standards that were in effect at the time of manufacture.	(a) Crawler, truck and locomotive cranes manufactured prior to [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must meet the applicable requirements for design, construction, and testing as prescribed in ANSI B30.5-1968 (incorporated by reference, see § 1926.6), PCSA Std. No. 2 (1968) (incorporated by reference, see § 1926.6), the requirements in paragraph (b) of this section, or the applicable DIN standards that were in effect at the time of manufacture.	**WAC 296-155-53700** (1) All crawler or truck cranes (greater than 2,000 pounds capacity) in use must meet the applicable requirements for design, construction, testing, inspection, maintenance, and operation as prescribed in the ASME B30.5, 2007, Safety Standard for Mobile and Locomotive Cranes. It is not the intent of this rule to require retrofitting of existing cranes. However, when an item is being modified, its performance needs to be reviewed by a qualified person and compared to the applicable sections of this rule. For modification requirements see WAC 296-155-53400(60) and (61). For cranes manufactured prior to the effective date of this rule the design, construction and testing criteria must meet at a minimum, ASME B30.5, 1989.
(b) Mobile (including crawler and truck) and locomotive cranes manufactured on or after [EFFECTIVE DATE OF THE FINAL RULE] shall meet the following portions of ASME B30.5-2004, "Mobile and Locomotive Cranes," as applicable: (1) In section 5-1.1.1 ("Load Ratings--Where Stability Governs Lifting Performance"), paragraphs (a)-(d) (including subparagraphs). (2) In section 5-1.1.2 ("Load Ratings--Where Structural Competence Governs Lifting Performance"), paragraph (b). (3) Section 5-1.2 ("Stability (Backward and Forward)"). (4) In section 5-1.3.1 ("Boom Hoist Mechanism"), paragraphs (a), (b)(1) and (b)(2), except that when using	(b) Mobile (including crawler and truck) and locomotive cranes manufactured on or after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERALREGISTER] must meet the following portions of ASME B30.5-2004 (incorporated by reference, see § 1926.6) as applicable: (1) In section 5-1.1.1 ("Load Ratings – Where Stability Governs Lifting Performance"), paragraphs (a) – (d) (including subparagraphs). (2) In section 5-1.1.2 ("Load Ratings – Where Structural Competence Governs Lifting Performance"), paragraph (b). (3) Section 5-1.2 ("Stability (Backward and Forward)"). (4) In section 5-1.3.1 ("Boom Hoist Mechanism"),	**WAC 296-155-53700** (1) All crawler or truck cranes (greater than 2,000 pounds capacity) in use must meet the applicable requirements for design, construction, testing, inspection, maintenance, and operation as prescribed in the ASME B30.5, 2007, Safety Standard for Mobile and Locomotive Cranes. It is not the intent of this rule to require retrofitting of existing cranes. However, when an item is being modified, its performance needs to be reviewed by a qualified person and compared to the applicable sections of this rule. For modification requirements see WAC 296-155-53400(60) and (61). For cranes manufactured prior to the effective date of this rule the design, construction and testing criteria must meet at a

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rotation resistant rope, Sec. 1926.1414(c)(4)(ii)(A) applies. (5) In section 5-1.3.2 ("Load Hoist Mechanism"), paragraphs (a)(2) through (a)(4) (including subparagraphs), (b) (including subparagraphs), (c) (first sentence only) and (d). (6) Section 5-1.3.3 ("Telescoping Boom"). (7) Section 5-1.4 ("Swing Mechanism"). (8) In section 5-1.5 ("Crane Travel"), all provisions except 5-1.5.3(d). (9) In section 5-1.6 ("Controls"), all provisions except 5-1.6.1(c). (10) Section 5-1.7.4 ("Sheaves"). (11) Section 5-1.7.5 ("Sheave sizes"). (12) In section 5-1.9.1 ("Booms"), paragraph (f). (13) Section 5-1.9.3 ("Outriggers"). (14) Section 5-1.9.4 ("Locomotive Crane Equipment"). (15) Section 5-1.9.7 ("Clutch and Brake Protection"). (16) In section 5-1.9.11 ("Miscellaneous equipment"), paragraphs (a), (c), (e), and (f).	paragraphs (a), (b)(1) and (b)(2), except that when using rotation resistant rope, § 1926.1414(c)(4)(ii)(A) applies. (5) In section 5-1.3.2 ("Load Hoist Mechanism"), paragraphs (a)(2) through (a)(4) (including subparagraphs), (b) (including subparagraphs), (c) (first sentence only) and (d). (6) Section 5-1.3.3 ("Telescoping Boom"). (7) Section 5-1.4 ("Swing Mechanism"). (8) In section 5-1.5 ("Crane Travel"), all provisions except 5-1.5.3(d). (9) In section 5-1.6 ("Controls"), all provisions except 5-.6.1 (c). (10) Section 5-1.7.4 ("Sheaves"). (11) Section 5-1.7.5 ("Sheave sizes"). (12) In section 5-1.9.1 ("Booms"), paragraph (f). (13) Section 5-1.9.3 ("Outriggers"). (14) Section 5-1.9.4 ("Locomotive Crane Equipment"). (15) Section 5-1.9.7 ("Clutch and Brake Protection"). (16) In section 5-1.9.11 ("Miscellaneous equipment"), paragraphs (a), (c), (e), and (f).	minimum, ASME B30.5, 1989.
(c) Prototype testing: Mobile (including crawler and truck) and locomotive cranes manufactured on or after [EFFECTIVE DATE OF THE FINAL RULE] shall meet the prototype testing requirements in Test Option A or Test Option B (~~see paragraphs (c)(1) and (c)(2)~~ of this section). Note ~~to paragraph (c) introductory text~~: Prototype testing of crawler, locomotive and truck cranes manufactured prior to the effective date of this subpart must conform to paragraph (a) of this section. (1) Test Option A. (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): All the tests listed	(c) Prototype testing: mobile (including crawler and truck) and locomotive cranes manufactured on or after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must meet the prototype testing requirements in Test Option A or Test Option B of this section. Tower cranes manufactured on or after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must meet the prototype testing requirements in BS EN 14439:2006 (incorporated by reference, see § 1926.6). NOTE: Prototype testing of crawler, locomotive and truck cranes manufactured prior to [INSERT DATE 90 DAYS	Prototype testing of mobile and tower cranes is not covered in DOSH's rule due to all construction cranes used in Washington must have a state issued certification which means the crane was inspected, operationally tested and proof load tested by an accredited crane certifier at least annually.

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in SAE J1063, Table 1, shall be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J1063, Table 2 shall be met. (ii) The following applies to equipment with pendant supported lattice booms: All the tests listed in SAE J987, Table 1, shall be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J987, Table 2 shall be met. (2) Test Option B. The testing and verification requirements of CEN's EN 13000 (2004) shall be met. In applying the CEN standard, the following additional requirements shall be met: (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J1063 meet the strength margins listed in SAE J1063 Table 2. (ii) The following applies to equipment with pendant supported lattice booms: The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J987 meet the strength margins listed in SAE J987 Table 2. (iii) Analysis verification. The physical testing requirements under SAE J1063 and SAE J987 must be met unless the reliability of the analysis methodology (computer modeling) has been demonstrated by a documented history of verification through strain gauge measuring or strain gauge measuring in combination with other physical testing.	AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must conform to paragraph (a) of this section. (1) *Test Option A*. (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): All the tests listed in SAE J1063 (Nov. 1993) Table 1 (incorporated by reference, see § 1926.6) must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J1063 (Nov. 1993) Table 2 (incorporated by reference, see § 1926.6) must be met. (ii) The following applies to equipment with pendant supported lattice booms: All the tests listed in SAE J987 (Jun. 2003) Table 1 (incorporated by reference, see § 1926.6) must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J987 (Jun. 2003) Table 2 (incorporated by reference, see § 1926.6) must be met. (2) *Test Option B*. The testing and verification requirements of BS EN 13000:2004 (incorporated by reference, see § 1926.6) must be met. In applying BS EN 13000:2004, the following additional requirements must be met: (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J1063 (Nov. 1993) (incorporated by reference, see § 1926.6) meet the strength margins listed in SAE J1063 (Nov. 1993) Table 2. (ii) The following applies to equipment with pendant supported lattice booms: The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J987 (Jun. 2003) (incorporated by reference, see § 1926.6) meet the strength margins listed in SAE J987	

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	(Jun. 2003) Table 2. (iii) *Analysis verification*. The physical testing requirements under SAE J1063 (Nov. 1993) (incorporated by reference, see § 1926.6) and SAE J987 (Jun. 2003) (incorporated by reference, see § 1926.6) must be met unless the reliability of the analysis methodology (computer modeling) has been demonstrated by a documented history of verification through strain gauge measuring or strain gauge measuring in combination with other physical testing.	
(d) All equipment covered by this subpart shall meet the following requirements: (1) Rated capacity and related information. The information available in the cab (see Sec. 1926.1417(c)) regarding "rated capacity" and related information shall include, at a minimum, the following information: (i) A complete range of the manufacturer's equipment rated capacities, as follows: (A) At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset). (B) Alternate ratings for use and nonuse of option equipment which affects rated capacities, such as outriggers and extra counterweights. (ii) A work area chart for which capacities are listed in the load chart. (Note: An example of this type of chart is in ASME B30.5-2004, section 5-1.1.3, Figure 11.) (iii) The work area figure and load chart shall clearly indicate the areas where no load is to be handled. (iv) Recommended reeving for the hoist lines shall be shown. (v) Recommended parts of hoist reeving, size, and type of	(d) All equipment covered by this subpart must meet the following requirements: (1) *Rated capacity and related information*. The information available in the cab (see § 1926.1417(c)) regarding "rated capacity" and related information must include, at a minimum, the following information: (i) A complete range of the manufacturer's equipment rated capacities, as follows: (A) At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset). (B) Alternate ratings for use and nonuse of option equipment which affects rated capacities, such as outriggers, stabilizers, and extra counterweights. (ii) A work area chart for which capacities are listed in the load chart. (Note: an example of this type of chart is in ASME B30.5-2004, section 5-1.1.3, Figure 11). (iii) The work area figure and load chart must clearly indicate the areas where no load is to be handled. (iv) Recommended reeving for the hoist lines must be shown. (v) Recommended parts of hoist reeving, size, and type of	**WAC 296-155-53400 General requirements.** (7) Rated capacity and related information. The information available in the operator's cab or station (see WAC 296-155-53400(6)) regarding "rated capacity" and related information must include, at a minimum, the following information: (a) A complete range of the manufacturer's rated capacities, as follows: (i) At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset). (ii) Alternate ratings for use and nonuse of optional equipment which affects rated capacities, such as outriggers, stabilizers, and extra counterweights. (b) A work area chart for which capacities are listed in the load chart. (Note: An example of this type of chart is in ASME B30.5-2007, section 5-1.1.3, Figure 11.) (c) The work area figure and load chart must clearly indicate the areas where no load is to be handled. (d) Recommended reeving for the hoist lines must be shown. (e) Recommended parts of hoist reeving, size, and type of

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wire rope for various equipment loads. (vi) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope. (vii) Tire pressure (where applicable). (viii) Caution or warnings relative to limitations on equipment and operating procedures, including an indication of the least stable direction. (ix) Position of the gantry and requirements for intermediate boom suspension (where applicable). (x) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered. (xi) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (xii) The maximum telescopic travel length of each boom telescopic section. (xiii) Whether sections are telescoped manually or with power. (xiv) The sequence and procedure for extending and retracting the telescopic boom section. (xv) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (xvi) Hydraulic relief valve settings specified by the manufacturer.	wire rope for various equipment loads. (vi) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope. (vii) Tire pressure (where applicable). (viii) Caution or warnings relative to limitations on equipment and operating procedures, including an indication of the least stable direction. (ix) Position of the gantry and requirements for intermediate boom suspension (where applicable). (x) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered. (xi) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (xii) The maximum telescopic travel length of each boom telescopic section. (xiii) Whether sections are telescoped manually or with power. (xiv) The sequence and procedure for extending and retracting the telescopic boom section. (xv) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (xvi) Hydraulic relief valve settings specified by the manufacturer.	wire rope for various crane loads. (f) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope. (g) Tire pressure (where applicable). (h) Caution or warnings relative to limitations on cranes and operating procedures, including an indication of the least stable direction. (i) Position of the gantry and requirements for intermediate boom suspension (where applicable). (j) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered. (k) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (l) The maximum telescopic travel length of each boom telescopic section. (m) Whether sections are telescoped manually or with power. (n) The sequence and procedure for extending and retracting the telescopic boom section. (o) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (p) Hydraulic relief valve settings specified by the manufacturer.
(2) Load hooks (including latched and unlatched types), ball assemblies and load blocks shall be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use. (3) Hook and ball assemblies and load blocks shall be	(2) Load hooks (including latched and unlatched types), ball assemblies and load blocks must be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use. (3) Hook and ball assemblies and load blocks must be	**WAC 296-155-53400(29)** (29) Crane hooks, ball assemblies, and load blocks. (a) All crane hooks, ball assemblies, and load blocks must be labeled with their rated capacity weight of the ball assembly and load block. (b) Crane hooks must be equipped with latches or self-

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marked with their rated capacity and weight.	marked with their rated capacity and weight.	locking devices unless the application makes the use of the latch impractical. The latch or self-locking device must bridge the throat opening of the hook for the purpose of retaining slings or other lifting devices under slack conditions.
(4) Latching hooks. (i) Hooks shall be equipped with latches, except where the requirements of paragraph (d)(4)(ii) of this section are met. (ii) Hooks without latches, or with latches removed or disabled, shall not be used unless: (A) A qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied-back). (B) Routes for the loads are pre-planned to ensure that no employee is required to work in the fall zone except for employees necessary for the hooking or unhooking of the load. (iii) The latch shall close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.	(4) *Latching hooks*. (i) Hooks must be equipped with latches, except where the requirements of paragraph (d)(4)(ii) of this section are met. (ii) Hooks without latches, or with latches removed or disabled, must not be used unless: (A) A qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tiedback). (B) Routes for the loads are pre-planned to ensure that no employee is required to work in the fall zone except for employees necessary for the hooking or unhooking of the load. (iii) The latch must close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.	**WAC 296-155-53400(29)** (29) Crane hooks, ball assemblies, and load blocks. (b) Crane hooks must be equipped with latches or self-locking devices unless a qualified person determines that it is safer to hoist and place the load without latches (or with the latches removed/tied back). The latch or self-locking device must bridge the throat opening of the hook for the purpose of retaining slings or other lifting devices under slack conditions.
(5) Posted warnings. Posted warnings required by this subpart as well as those originally supplied with the equipment by the manufacturer shall be maintained in legible condition.	(5) *Posted warnings*. Posted warnings required by this subpart as well as those originally supplied with the equipment by the manufacturer must be maintained in legible condition.	**WAC 296-155-53400** (5) Warning decals and placards must be installed and legible as prescribed by this part and the crane manufacturer.
(6) An accessible fire extinguisher shall be on the equipment.	(6) An accessible fire extinguisher must be on the equipment.	**WAC 296-155-53400(10)** (10) A portable fire extinguisher, with a basic minimum extinguisher rating of 10 BC, must be installed in the cab or at the machinery housing. Additional requirements relating to portable fire extinguishers can be found in WAC 296-800-300.
(7) Cabs. Equipment with cabs shall meet the following	(7) *Cabs*. Equipment with cabs must meet the following	**WAC 296-155-53400(11)**

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requirements: (i) Cabs shall be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper. (ii) Cab doors (swinging, sliding) shall be designed to prevent inadvertent opening or closing while traveling or operating the machine. Swinging doors adjacent to the operator shall open outward. Sliding operator doors shall open rearward. (iii) Windows. (A) The cab shall have windows in front and on both sides of the operator. Forward vertical visibility shall be sufficient to give the operator a view of the boom point at all times. (B) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened shall be designed so that they can be secured to prevent inadvertent closure. (C) Windows shall be of safety glass or material with similar optical and safety properties, that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment. (iv) A clear passageway shall be provided from the operator's station to an exit door on the operator's side. (v) Areas of the cab roof that serve as a workstation for rigging, maintenance or other equipment-related tasks shall be capable of supporting 250 pounds without permanent distortion.	requirements: (i) Cabs must be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper. (ii) Cab doors (swinging, sliding) must be designed to prevent inadvertent opening or closing while traveling or operating the machine. Swinging doors adjacent to the operator must open outward. Sliding operator doors must open rearward. (iii) *Windows*. (A) The cab must have windows in front and on both sides of the operator. Forward vertical visibility must be sufficient to give the operator a view of the boom point at all times. (B) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened must be designed so that they can be secured to prevent inadvertent closure. (C) Windows must be of safety glass or material with similar optical and safety properties, that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment. (iv) A clear passageway must be provided from the operator's station to an exit door on the operator's side. (v) Areas of the cab roof that serve as a workstation for rigging, maintenance or other equipment-related tasks must be capable of supporting 250 pounds without permanent distortion.	(11) Cabs. Cranes/derricks with cabs must meet the following requirements: (a) Cabs must be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper. (b) Cab doors (swinging, sliding) must be designed to prevent inadvertent opening or closing while traveling or operating the machine. Swinging doors adjacent to the operator must open outward. Sliding operator doors must open rearward. (c) Windows. (i) The cab must have windows in front and on both sides of the operator. Forward vertical visibility must be sufficient to give the operator a view of the boom point at all times. (ii) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened must be designed so that they can be secured to prevent inadvertent closure. (iii) Windows must be of safety glass or material with similar optical and safety properties that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment. (d) A clear passageway must be provided from the operator's station to an exit door on the operator's side. (e) Areas of the cab roof that serve as a workstation for rigging, maintenance or other equipment-related tasks must be capable of supporting 250 pounds without permanent

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		distortion.
(8) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, and other parts or components that reciprocate, rotate or otherwise move shall be guarded where contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties.	(8) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, and other parts or components that reciprocate, rotate or otherwise move must be guarded where contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties.	**WAC 296-155-53400(17)** (17) While in operation, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment must be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding must meet the requirements of chapter 296-806 WAC, Machine safety.
(9) All exhaust pipes, turbochargers, and charge air coolers shall be insulated or guarded where contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties.	(9) All exhaust pipes, turbochargers, and charge air coolers must be insulated or guarded where contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties.	**WAC 296-155-53400(19)** (19) All exhaust pipes, turbochargers, and charge air coolers must be guarded or insulated in areas where contact by employees is possible in the performance of normal duties and are discharged in a direction away from the operator.
(10) Hydraulic and pneumatic lines shall be protected from damage to the extent feasible.	(10) Hydraulic and pneumatic lines must be protected from damage to the extent feasible.	**WAC 296-155-53400(20)** (20) Hydraulic and pneumatic lines shall be protected from damage to the extent feasible.
(11) The equipment shall be designed so that exhaust fumes are not discharged in the cab and are discharged in a direction away from the operator.	(11) The equipment must be designed so that exhaust fumes are not discharged in the cab and are discharged in a direction away from the operator.	**WAC 296-155-53400(19)** (19) All exhaust pipes, turbochargers, and charge air coolers must be guarded or insulated in areas where contact by employees is possible in the performance of normal duties and are discharged in a direction away from the operator.
(12) Friction mechanisms. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they shall be: (i) Of a size and thermal capacity sufficient to control loads with the minimum recommended reeving. (ii) Adjustable to permit compensation for lining wear to maintain proper operation.	(12) *Friction mechanisms*. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they must be: (i) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving. (ii) Adjustable to permit compensation for lining wear to maintain proper operation.	**WAC 296-155-53400(21)** (21) Friction mechanisms. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they must be: (a) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving. (b) Adjustable to permit compensation for lining wear to maintain proper operation.
(13) Hydraulic load hoists. Hydraulic drums shall have an integrally mounted holding device or internal static brake to	(13) *Hydraulic load hoists*. Hydraulic drums must have an integrally mounted holding device or internal static brake to	**WAC 296-155-53400(22)** (22) Hydraulic load hoists. Hydraulic drums must have an

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prevent load hoist movement in the event of hydraulic failure.	prevent load hoist movement in the event of hydraulic failure.	integrally mounted holding device or internal static brake to prevent load hoist movement in the event of hydraulic failure.
(e) The employer's obligations under paragraphs (a) through (c) and (d)(7) through (13) of this section are met where the equipment has not changed (except in accordance with Sec. 1926.1434 (Equipment modifications)) and it can refer to documentation from the manufacturer showing that the equipment has been designed, constructed and tested in accordance with those paragraphs.	(e) The employer's obligations under paragraphs (a) through (c) and (d)(7) through (13) of this section are met where the equipment has not changed (except in accordance with § 1926.1434 (Equipment modifications)) and it can refer to documentation from the manufacturer showing that the equipment has been designed, constructed and tested in accordance with those paragraphs.	
Sec. 1926.1434 Equipment modifications.	**§ 1926.1434 Equipment modifications.**	**WAC 296-155-53400**
(a) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the requirements of paragraph (a)(1), (a)(2), or (a)(3) of this section are met. (1) Manufacturer review and approval. (i) The manufacturer approves the modifications/additions in writing. (ii) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition. (iii) The original safety factor of the equipment is not reduced. (2) Manufacturer refusal to review request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met: (i) A registered professional engineer who is a qualified person with respect to the equipment involved:	(a) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the requirements of paragraphs (a)(1), (a)(2), (a)(3), (a)(4), or (a)(5) of this section are met. (1) *Manufacturer review and approval*. (i) The manufacturer approves the modifications/additions in writing. (ii) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition. (iii) The original safety factor of the equipment is not reduced. (2) *Manufacturer refusal to review request*. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/ addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met: (i) A registered professional engineer who is a qualified person with respect to the equipment involved:	**WAC 296-155-53400(60)** (60) Modifications or additions which affect the capacity or safe operation of the crane/derrick are prohibited except where the requirements of subsection (a) or (b) of this section are met. (a) Manufacturer review and approval. (i) The manufacturer approves the modifications/additions in writing. (ii) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition. (iii) The original safety factor of the crane/derrick is not reduced. (b) Manufacturer is unavailable or has refused to review a request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met: (i) A registered professional engineer who is a qualified

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(A) Approves the modification/addition and specifies the equipment configurations to which that approval applies, and (B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition. (ii) The original safety factor of the equipment is not reduced. (3) Unavailable manufacturer. The manufacturer is unavailable and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	(A) Approves the modification/addition and specifies the equipment configurations to which that approval applies, and (B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition. (ii) The original safety factor of the equipment is not reduced. (3) *Unavailable manufacturer*. The manufacturer is unavailable and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met. (4) *Manufacturer does not complete the review within 120 days of the request*. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/ addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met. (5) *Multiple manufacturers of equipment designed for use on marine work sites*. The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	person with respect to the crane/derrick involved: (A) Approves the modification/addition and specifies the crane/derrick configurations to which that approval applies, and (B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition. (ii) The original safety factor of the crane/derrick is not reduced. (c) Manufacturer does not complete the review within 120 days of the request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/ addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of subsections (60)(b)(i) and (ii) of this section are met. (d) Multiple manufacturers of equipment designed for use on marine work sites. The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of subsections (60)(b)(i) and (ii) of this section are met.
(b) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing, the employer may	(b) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing, the employer may	**WAC 296-155-53400(61)** (61) No modifications or additions which affect the capacity or safe operation of the crane can be made by the employer without the manufacturers' written approval. If components of more than one crane manufacturer are being combined, the employer must obtain written approval from all manufacturers prior to use. If the manufacturer(s) is/are not

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treat this as a manufacturer refusal to review the request under paragraph (a)(2) of this section.	treat this as a manufacturer refusal to review the request under paragraph (a)(2) of this section.	available a registered professional structural engineer's (RPSE) written approval must be obtained. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, must be changed accordingly. In no case must the original safety factor of the crane be reduced.
(c) The provisions in paragraphs (a) and (b) of this section do not apply to modifications made or approved by the U.S. military.	(c) The provisions in paragraphs (a) and (b) of this section do not apply to modifications made or approved by the U.S. military.	Note: The provisions in paragraphs (45) and (46) of this section do not apply to modifications made or approved by the U.S. military.
Sec. 1926.1435 Tower cranes.	**§ 1926.1435 Tower cranes.**	**WAC 296-155-53900 Tower Cranes - General.**
(a) This section contains supplemental requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise. (b) Erecting, climbing and dismantling. (1) Section 1926.1403 (Assembly/Disassembly--selection of manufacturer or employer procedures), Sec. 1926.1404 (Assembly/Disassembly--general requirements (applies to all assembly and disassembly operations)), Sec. 1926.1405 (Disassembly--additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)), and Sec. 1926.1406 (Assembly/Disassembly--employer procedures--general requirements), apply to tower cranes (except as otherwise specified), except that the term "assembly/disassembly" is replaced by "erecting, climbing and dismantling," and the term "disassembly" is replaced by "dismantling."	(a) This section contains supplemental requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise. (b) *Erecting, climbing and dismantling*. (1) Section 1926.1403 (Assembly/Disassembly – selection of manufacturer or employer procedures), § 1926.1404 (Assembly/Disassembly – general requirements (applies to all assembly and disassembly operations)), § 1926.1405 (Disassembly – additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)), and § 1926.1406 (Assembly/Disassembly – employer procedures – general requirements), apply to tower cranes (except as otherwise specified), except that the term "assembly/ disassembly" is replaced by "erecting, climbing and dismantling," and the term "disassembly" is replaced by "dismantling."	(1) This section contains supplemental requirements for tower cranes; all sections of this part apply to tower cranes unless specified otherwise. In addition, the requirements in WAC 296-155-53402 apply unless otherwise specified, except that the term "assembly/ disassembly" is replaced by "erecting, climbing and dismantling," and the term "disassembly" is replaced by "dismantling."
(2) Dangerous areas (self-erecting tower cranes). In addition to the requirements in Sec. 1926.1404(e), for self-erecting tower cranes, the following applies: Employees shall not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling	(2) *Dangerous areas (self-erecting tower cranes)*. In addition to the requirements in § 1926.1404(e), for self-erecting tower cranes, the following applies: Employees must not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling	**WAC 296-155-54100** (2) In addition to the requirements in WAC 296-155-53402(6), employees must not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a

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operations until the crane is secured in a locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.	operations until the crane is secured in a locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.	locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.
(3) Foundations and structural supports. Tower crane foundations and structural supports shall be designed by the manufacturer or a registered professional engineer.	(3) *Foundations and structural supports*. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) must be designed by the manufacturer or a registered professional engineer.	(12) Foundations and structural supports. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) must be designed by the manufacturer or a registered professional engineer.
(4) Addressing specific hazards. The requirements in Sec. 1926.1404(h)(1) through (9) apply. In addition, the A/D supervisor shall address the following: (i) Foundations and structural supports. The A/D supervisor shall verify that tower crane foundations and structural supports are installed in accordance with their design. (ii) Loss of backward stability. Backward stability ~~must be considered~~ before swinging self erecting cranes or cranes on traveling or static undercarriages. (iii) Wind speed. Wind must not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.	(4) *Addressing specific hazards*. The requirements in § 1926.1404(h)(1) through (9) apply. In addition, the A/D director must address the following: (i) *Foundations and structural supports*. The A/D director must determine that tower crane foundations and structural supports are installed in accordance with their design. (ii) *Loss of backward stability*. Backward stability before swinging self erecting cranes or cranes on traveling or static undercarriages. (iii) *Wind speed*. Wind must not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.	**WAC 296-155-53900** (15) The assembly/disassembly director must determine that tower cranes are attached to bases/structural supports in compliance with the manufacturer's or a RPSE's instructions and in accordance with their design. (16) The assembly/disassembly director must address backward stability before swinging, traveling or freestanding tower cranes. **WAC 296-155-54100** (7) The assembly/disassembly director must address backward stability before swinging self-erecting tower cranes. **WAC 296-155-53900** (23) Before climbing or erecting/dismantling, cranes must be balanced in accordance with the manufacturer's or a qualified person's instructions. If no such limit has been set, wind velocity must not exceed the limit set by the manufacturer, or 20 miles per hour as indicated by a wind velocity device mounted near the top of the crane . The crane operator must be present during climbing or erecting/dismantling operations.

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(5) Plumb tolerance. Towers shall be erected plumb to the manufacturer's tolerance and verified by a qualified person. Where the manufacturer does not specify plumb tolerance, the crane tower shall be plumb to a tolerance of at least 1:500 (approximately 1 inch in 40 feet).	(5) *Plumb tolerance*. Towers must be erected plumb to the manufacturer's tolerance and verified by a qualified person. Where the manufacturer does not specify plumb tolerance, the crane tower must be plumb to a tolerance of at least 1:500 (approximately 1 inch in 40 feet).	(8) Tower masts must be erected plumb to a tolerance of 1:500 (approximately 1 inch in 40 feet) unless the manufacturer specifies otherwise and verified by a qualified person.
(6) Multiple tower crane jobsites. On jobsites where more than one fixed jib (hammerhead) tower crane is installed, the cranes shall be located such that no crane may come in contact with the structure of another crane. Cranes are permitted to pass over one another.	(6) *Multiple tower crane jobsites*. On jobsites where more than one fixed jib (hammerhead) tower crane is installed, the cranes must be located such that no crane can come in contact with the structure of another crane. Cranes are permitted to pass over one another.	(40) Multiple tower crane jobsites. On jobsites where more than one tower crane is installed, the cranes must be located such that no crane may come in contact with the structure of another crane. Crane's jibs or booms are permitted to pass over one another.
(7) Climbing procedures. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer shall: (i) Comply with all manufacturer prohibitions. (ii) Have a registered professional engineer verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors. ~~(iii) Ensure that no part of the climbing procedure takes place when wind exceeds the speed recommended by the manufacturer or, where the manufacturer does not specify this information, the speed determined by a qualified person.~~	(7) *Climbing procedures*. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer must: (i) Comply with all manufacturer prohibitions. (ii) Have a registered professional engineer verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors.	(18) Prior to installing a tower crane that will be attached to an existing building, new construction, or structure, an RPSE must certify that the structural attachment to the building are designed to withstand the torsional and overturning moments and the horizontal and vertical forces created by the crane to be installed. (22) When inside climbing cranes are used, the integrity of the host structure must be reviewed by an RPSE, for the effects of the crane, load, and wind forces at each level of the structure.
(8) Counterweight/ballast. (i) Equipment shall not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a registered professional engineer familiar with the equipment. (ii) The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment shall not be exceeded.	(8) *Counterweight/ballast*. (i) Equipment must not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a registered professional engineer familiar with the equipment. (ii) The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment must not be exceeded.	**WAC 296-155-53900** (25) Crane superstructures and counterjibs (counterweight jib) must be arranged to receive counterweights, made in accordance with the manufacturer's specifications for the specified jib or boom length, and to hold them in position. Means must be provided to guard against shifting or dislodgement during crane operation. Manufacturer's specified counterweight weights are not to be exceeded.
(c) Signs. The size and location of signs installed on tower	(c) *Signs*. The size and location of signs installed on tower	**WAC 296-155-53900**

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cranes must be in accordance with manufacturer specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve in writing the size and location of any signs.	cranes must be in accordance with manufacturer specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve in writing the size and location of any signs.	(63) Advertising signs or similar panels must not be installed on the crane or tower unless size, design, and positioning satisfy the manufacturer's recommendations, in the absence of the manufacturer's recommendations, an RPE's written approval must be obtained.
(d) Safety devices. (1) Section 1926.1415 does not apply to tower cranes. (2) The following safety devices are required on all tower cranes unless otherwise specified: (i) Boom stops on luffing boom type tower cranes. (ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment. (iii) Travel rail end stops at both ends of travel rail. (iv) Travel rail clamps on all travel bogies. (v) Integrally mounted check valves on all load supporting hydraulic cylinders. (vi) Hydraulic system pressure limiting device. (vii) The following brakes, which shall automatically set in the event of pressure loss or power failure, are required: (A) A hoist brake on all hoists. (B) Swing brake. (C) Trolley brake. (D) Rail travel brake. (viii) Deadman control or forced neutral return control (hand) levers. (ix) Emergency stop switch at the operator's station. (x) Trolley end stops shall be provided at both ends of travel of the trolley. (3) Proper operation required. Operations shall not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator shall safely stop operations.	(d) *Safety devices*. (1) Section 1926.1415 does not apply to tower cranes. (2) The following safety devices are required on all tower cranes unless otherwise specified: (i) Boom stops on luffing boom type tower cranes. (ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment. (iii) Travel rail end stops at both ends of travel rail. (iv) Travel rail clamps on all travel bogies. (v) Integrally mounted check valves on all load supporting hydraulic cylinders. (vi) Hydraulic system pressure limiting device. (vii) The following brakes, which must automatically set in the event of pressure loss or power failure, are required: (A) A hoist brake on all hoists. (B) Swing brake. (C) Trolley brake. (D) Rail travel brake. (viii) Deadman control or forced neutral return control (hand) levers. (ix) Emergency stop switch at the operator's station. (x) Trolley end stops must be provided at both ends of travel of the trolley. (3) *Proper operation required*. Operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. The	(61) Safety devices. (a) The following safety devices are required on all tower cranes unless otherwise specified: (i) Boom stops on luffing boom type tower cranes; (ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment; (iii) Travel rail end stops at both ends of travel rail; (iv) Travel rail clamps on all travel bogies; (v) Integrally mounted check valves on all load supporting hydraulic cylinders; (vi) Hydraulic system pressure limiting device; (vii) The following brakes, which must automatically set in the event of pressure loss or power failure, are required: (A) A hoist brake on all hoists; (B) Slewing brake; (C) Trolley brake; (D) Rail travel brake. (viii) Deadman control or forced neutral return control (hand) levers; (ix) Emergency stop switch at the operator's station; (x) Trolley end stops must be provided at both ends of travel of the trolley. (b) Proper operation required. Operations must not begin unless the devices listed in this subsection are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. The crane must be taken out of service and operations must not

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Operations shall not resume until the device is again working properly. Alternative measures are not permitted to be used.	equipment must be taken out of service, and operations must not resume until the device is again working properly. See § 1926.1417(f). Alternative measures are not permitted to be used.	resume until the device is again working properly. Alternative measures are not permitted to be used.
(e) Operational aids. (1) Section 1926.1416 does not apply to tower cranes. (2) The devices listed in this section ("operational aids") are required on all tower cranes covered by this subpart, unless otherwise specified. (3) Operations shall not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, shall be followed. (4) If an operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under Sec. 1926.1434.	(e) *Operational aids*. (1) Section 1926.1416 does not apply to tower cranes. (2) The devices listed in this section ("operational aids") are required on all tower cranes covered by this subpart, unless otherwise specified. (3) Operations must not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, must be followed. See § 1926.1417(j) for additional requirements. (4) If an operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under § 1926.1434.	(62) Operational aids. (a) The devices listed in this subsection ("operational aids") are required on all tower cranes covered by this part, unless otherwise specified. (b) Crane operations must not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, must be followed. (c) If an operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under WAC 296-155-53400(60) and (61).
(5) Category I operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly shall be repaired no later than 7 days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 days of the occurrence of the deficiency, the repair shall be completed within 7 days of receipt of the parts. (i) Trolley travel limiting device. The travel of the trolley shall be restricted at both ends of the jib by a trolley travel limiting device to prevent the trolley from running into the	(5) *Category I operational aids and alternative measures.* Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts. (i) *Trolley travel limiting device*. The travel of the trolley must be restricted at both ends of the jib by a trolley travel limiting device to prevent the trolley from running into the	(d) Category I operational aids and alternative measures. Operational aids listed in this subsection that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts. (i) Trolley travel limiting device. The travel of the trolley must be restricted at both ends of the jib by a trolley travel

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trolley end stops. Temporary alternative measures: (A) Option A. The trolley rope shall be marked (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops. (B) Option B. A spotter shall be used when operations are conducted within 10 feet of the outer or inner trolley end stops. (ii) Boom hoist limiting device. The range of the boom shall be limited at the minimum and maximum radius. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter. (iii) Anti two-blocking device. The tower crane shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. (iv) Hoist drum lower limiting device. Tower cranes manufactured more than one year after the effective date of this standard shall be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum. Temporary alternative measures: Mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last 2 wraps of hoist cable being spooled off the drum, or use a spotter.	trolley end stops. *Temporary alternative measures*: (A) *Option A*. The trolley rope must be marked (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops. (B) *Option B*. A spotter who is in direct communication with the operator must be used when operations are conducted within 10 feet of the outer or inner trolley end stops. (ii) *Boom hoist limiting device*. The range of the boom must be limited at the minimum and maximum radius. *Temporary alternative measures*: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. (iii) *Anti two-blocking device*. The tower crane must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. *Temporary alternative measures*: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. (iv) *Hoist drum lower limiting device*. Tower cranes manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must be equipped with a device	limiting device to prevent the trolley from running into the trolley end stops. Temporary alternative measures: (A) Option A. The trolley rope must be marked (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops. (B) Option B. A spotter who is in direct communication with the operator must be used when operations are conducted within 10 feet of the outer or inner trolley end stops. (ii) Boom hoist limiting device. The range of the boom must be limited at the minimum and maximum radius. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. (iii) Anti two-blocking device. The tower crane must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.. (iv) Hoist drum lower limiting device. Tower cranes manufactured after the effective date of this section must be equipped with a device that prevents the last 2 wraps of

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	that prevents the last 2 wraps of hoist cable from being spooled off the drum. *Temporary alternative measures*: Mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last 2 wraps of hoist cable being spooled off the drum, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached	hoist cable from being spooled off the drum. Temporary alternative measures: Mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last 2 wraps of hoist cable being spooled off the drum, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.
(v) Load moment limiting device. The tower crane shall have a device that prevents moment overloading. Temporary alternative measures: A radius indicating device shall be used (if the tower crane is not equipped with a radius indicating device, the radius shall be measured to ensure the load is within the rated capacity of the crane). In addition, the weight of the load shall be determined from a reliable source (such as the load's manufacturer), by a ~~reliable~~ calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information shall be provided to the operator prior to the lift. (vi) Hoist line pull limiting device. The capacity of the hoist shall be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. Temporary alternative measures: The operator shall ensure that the weight of the load does not exceed the capacity of the hoist (including for each individual gear ratio if equipped with a multiple speed hoist transmission). (vii) Rail travel limiting device. The travel distance in each direction shall be limited to prevent the travel bogies from running into the end stops or buffers. Temporary alternative measures: A spotter shall be used when operations are conducted within 10 feet of either end of the travel rail end	(v) *Load moment limiting device*. The tower crane must have a device that prevents moment overloading. *Temporary alternative measures*: A radius indicating device must be used (if the tower crane is not equipped with a radius indicating device, the radius must be measured to ensure the load is within the rated capacity of the crane). In addition, the weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift. (vi) *Hoist line pull limiting device*. The capacity of the hoist must be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. *Temporary alternative measures*: The operator must ensure that the weight of the load does not exceed the capacity of the hoist (including for each individual gear ratio if equipped with a multiple speed hoist transmission). (vii) *Rail travel limiting device*. The travel distance in each direction must be limited to prevent the travel bogies from running into the end stops or buffers. *Temporary alternative measures*: A spotter who is in direct communication with	(v) Load moment limiting device. The tower crane must have a device that prevents moment overloading. Temporary alternative measures: A radius indicating device must be used (if the tower crane is not equipped with a radius indicating device, the radius must be measured to ensure the load is within the rated capacity of the crane). In addition, the weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift. (vi) Hoist line pull limiting device. The capacity of the hoist must be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. Temporary alternative measures: The operator must ensure that the weight of the load does not exceed the capacity of the hoist (including for each individual gear ratio if equipped with a multiple speed hoist transmission). (vii) Rail travel limiting device. The travel distance in each direction must be limited to prevent the travel bogies from running into the end stops or buffers. Temporary alternative measures: A spotter who is in direct communication with the operator must be used when operations are conducted

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stops. (viii) Boom hoist drum positive locking device. The boom hoist drum shall be equipped with a ~~device~~ to positively lock the boom hoist drum. Temporary alternative measures: The device shall be manually set when required if an electric, hydraulic or automatic type is not functioning.	the operator must be used when operations are conducted within 10 feet of either end of the travel rail end stops; the spotter must inform the operator of the distance of the travel bogies from the end stops or buffers. (viii) *Boom hoist drum positive locking device and control*. The boom hoist drum must be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. *Temporary alternative measures*: The device must be manually set when required if an electric, hydraulic or automatic control is not functioning.	within 10 feet of either end of the travel rail end stops; the spotter must inform the operator of the distance of the travel bogies from the end stops or buffers. (viii) Boom hoist drum positive locking device and control. The boom hoist drum must be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. Temporary alternative measures: The device must be manually set when required if an electric, hydraulic or automatic type is not functioning.
(6) Category II operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly shall be repaired no later than 30 days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 days, the repair shall be completed within 7 days of receipt of the parts. (i) Boom angle or hook radius indicator. (A) Luffing boom tower cranes shall have a boom angle indicator readable from the operator's station. (B) Hammerhead tower cranes manufactured more than one year after the effective date of this subpart shall have a hook radius indicator readable from the operator's station. (C) Temporary alternative measures: Hook radii or boom angle shall be determined by measuring the hook radii or boom angle with a measuring device.	(6) *Category II operational aids and alternative measures*. Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts. (i) *Boom angle or hook radius indicator*. (A) Luffing boom tower cranes must have a boom angle indicator readable from the operator's station. (B) Hammerhead tower cranes manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OFPUBLICATION IN THE FEDERAL REGISTER] must have a hook radius indicator readable from the operator's station. (C) *Temporary alternative measures*: Hook radii or boom angle must be determined by measuring the hook radii or boom angle with a measuring device.	(e) Category II operational aids and alternative measures. Operational aids listed in this subsection that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts. (i) Boom angle or hook radius indicator. (A) Luffing boom tower cranes must have a boom angle indicator readable from the operator's station. (B) Hammerhead tower cranes manufactured after the effective date of this section must have a hook radius indicator readable from the operator's station. Temporary alternative measures: Hook radii or boom angle must be determined by measuring the hook radii or boom angle with a measuring device.
(ii) Trolley travel deceleration device. The trolley speed shall be automatically reduced prior to the trolley reaching	(ii) *Trolley travel deceleration device*. The trolley speed must be automatically reduced prior to the trolley reaching	(ii) Trolley travel deceleration device. The trolley speed must be automatically reduced prior to the trolley reaching

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the end limit in both directions. Temporary alternative measure: ~~The operator shall reduce the trolley speed when approaching the trolley end limits.~~ (iii) Boom hoist deceleration device. The boom speed shall be automatically reduced prior to the boom reaching the minimum or maximum radius limit. Temporary alternative measure: The operator shall reduce the boom speed when approaching the boom maximum or minimum end limits. (iv) Load hoist deceleration device. The load speed shall be automatically reduced prior to the hoist reaching the upper limit. Temporary alternative measure: The operator shall reduce the hoist speed when approaching the upper limit. (v) Wind speed indicator. A device shall be provided to display the wind speed and shall be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it shall be mounted at or above the jib level. Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed. (vi) Load indicating device. Cranes manufactured more than one year after the effective date of this standard, shall have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. Temporary alternative measures: The weight of the load shall be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information shall be provided to the operator prior to the lift.	the end limit in both directions. *Temporary alternative measure*: The employer must post a notice in the cab of the crane notifying the operator that the trolley travel deceleration device is malfunctioning and instructing the operator to take special care to reduce the trolley speed when approaching the trolley end limits. (iii) *Boom hoist deceleration device*. The boom speed must be automatically reduced prior to the boom reaching the minimum or maximum radius limit. *Temporary alternative measure*: The employer must post a notice in the cab of the crane notifying the operator that the boom hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the boom speed when approaching the minimum or maximum radius limits. (iv) *Load hoist deceleration device*. The load speed must be automatically reduced prior to the hoist reaching the upper limit. *Temporary alternative measure*: The employer must post a notice in the cab of the crane notifying the operator that the load hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the load speed when approaching the upper limits. (v) *Wind speed indicator*. A device must be provided to display the wind speed and must be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it must be mounted at or above the jib level. *Temporary alternative measures*: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed. (vi) *Load indicating device*. Cranes manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] must	the end limit in both directions. Temporary alternative measure: The employer must post a notice in the cab of the crane notifying the operator that the trolley travel deceleration device is malfunctioning and instructing the operator to take special care to reduce the trolley speed when approaching the trolley end limits. (iii) Boom hoist deceleration device. The boom speed must be automatically reduced prior to the boom reaching the minimum or maximum radius limit. Temporary alternative measure: The employer must post a notice in the cab of the crane notifying the operator that the boom hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the boom speed when approaching the boom maximum or minimum end limits. (iv) Load hoist deceleration device. The load speed must be automatically reduced prior to the hoist reaching the upper limit. Temporary alternative measure: The employer must post a notice in the cab of the crane notifying the operator that the load hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the hoist speed when approaching the upper limit. (v) Wind speed indicator. A device must be provided to display the wind speed and must be mounted at or near the top of the crane structure . Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed. (vi) Load indicating device. Cranes manufactured after the effective date of this section, must have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. Temporary

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	have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. *Temporary alternative measures*: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.	alternative measures: The weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.
(f) Inspections. (1) Section 1926.1412 (Inspections) applies to tower cranes, except that the term "assembly" is replaced by "erection." (2) Post-erection inspection. In addition to the requirements in Sec. 1926.1412(c), the following requirements shall be met: (i) A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, shall be conducted after each erection. (ii) The load test shall be conducted in accordance with the manufacturer's instructions. Where these instructions are unavailable, a registered professional engineer familiar with the type of equipment involved shall develop written load test procedures. (3) Monthly. The following additional items shall be included: (i) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (ii) The upper-most tie-in, braces, floor supports and floor	(f) *Inspections*. (1) Section 1926.1412 (Inspections) applies to tower cranes, except that the term "assembly" is replaced by "erection." Section 1926.1413 (Wire rope – inspection) applies to tower cranes. (2) *Pre-erection inspection*. Before each crane component is erected, it must be inspected by a qualified person for damage or excessive wear. (i) The qualified person must pay particular attention to components that will be difficult to inspect thoroughly during shift inspections. (ii) If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, that component must not be erected on the crane unless it is repaired and, upon re-inspection by the qualified person, found to no longer create a safety hazard. (iii) If the qualified person determines that, though not presently a safety hazard, the component needs to be monitored, the employer must ensure that the component is checked in the monthly inspections. Any such determination	**WAC 296-155-52901 Certification and proof load testing – requirement.** Effective January 1, 2010, all cranes and derricks covered in WAC 296-155-52900 and not exempt in paragraph (3) of that section, must be certified and proof load tested annually by an accredited crane certifier recognized by the department. Note: For additional inspection criteria and proof load testing requirements for specific types of cranes, see: WAC 296-155-53202 for Mobile cranes. WAC 296-155-53204 for Articulating boom cranes. WAC 296-155-53206 for Tower cranes. WAC 296-155-53208 for Self-erecting tower cranes. WAC 296-155-53210 for Overhead and bridge cranes. WAC 296-155-53212 for Derricks.

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wedges where the tower crane is supported by the structure, for loose or dislodged components.	must be documented, and the documentation must be available to any individual who conducts a monthly inspection. (3) *Post-erection inspection*. In addition to the requirements in § 1926.1412(c), the following requirements must be met: (i) A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, must be conducted after each erection. (ii) The load test must be conducted in accordance with the manufacturer's instructions when available. Where these instructions are unavailable, the test must be conducted in accordance with written load test procedures developed by a registered professional engineer familiar with the type of equipment involved. (4) *Monthly*. The following additional items must be included: (i) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (ii) The upper-most tie-in, braces, floor supports and floor wedges where the tower crane is supported by the structure, for loose or dislodged components. (5) *Annual*. In addition to the items that must be inspected under § 1926.1412(f), all turntable and tower bolts must be inspected for proper condition and torque.	**WAC 296-155-53905 Tower Cranes – Additional Inspection Criteria** (1) In addition to the requirements in WAC 296-155-53405, the following additional items must be included: (a) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (b) The upper-most tie-in, braces, floor supports and floor wedges where the tower crane is supported by the structure, for loose or dislodged components. (2) *Annual*. In addition to the items that must be inspected under § 1926.1412(f), all turntable and tower bolts must be inspected for proper condition and torque.
Sec. 1926.1436 Derricks.	**§ 1926.1436 Derricks.**	**WAC 296-155-54300 Derricks - General.**
(a) This section contains supplemental requirements for derricks, whether temporarily or permanently mounted; all sections of this subpart apply to derricks unless specified otherwise. A derrick is powered equipment consisting of a mast or equivalent member that is held at or near the end by	(a) This section contains supplemental requirements for derricks, whether temporarily or permanently mounted; all sections of this subpart apply to derricks unless specified otherwise. A derrick is powered equipment consisting of a mast or equivalent member that is held at or near the end by	(1) This section contains supplemental requirements for derricks, whether temporarily or permanently mounted; all sections of this part apply to derricks unless specified otherwise. A derrick is powered equipment consisting of a mast or equivalent member that is held at or near the end by

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guys or braces, with or without a boom, and its hoisting mechanism. The mast/equivalent member and/or the load is moved by the hoisting mechanism (typically base-mounted) and operating ropes. Derricks include: A-frame, basket, breast, Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shearleg, stiffleg, and variations of such equipment.	guys or braces, with or without a boom, and its hoisting mechanism. The mast/equivalent member and/or the load is moved by the hoisting mechanism (typically base-mounted) and operating ropes. Derricks include: A-frame, basket, breast, Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shearleg, stiffleg, and variations of such equipment.	guys or braces, with or without a boom, and its hoisting mechanism. The mast/equivalent member and/or the load is moved by the hoisting mechanism (typically base-mounted) and operating ropes. Derricks include: A-frame, basket, breast, Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shearleg, stiffleg, and variations of such equipment.
(b) Operation--procedures. (1) Section 1926.1417 (Operation) applies except for Sec. 1926.1417(c) (accessibility of procedures). (2) Load chart contents. Load charts shall contain at least the following information: (i) Rated capacity at corresponding ranges of boom angle or operating radii. (ii) Specific lengths of components to which the rated capacities apply. (iii) Required parts for hoist reeving. (iv) Size and construction of rope shall be included on the load chart or in the operating manual. (3) Load chart location. (i) Permanent installations. For permanently installed derricks with fixed lengths of boom, guy, and mast, a load chart shall be posted where it is visible to personnel responsible for the operation of the equipment. (ii) Non-permanent installations. For derricks that are not permanently installed, the load chart shall be readily available at the job site to personnel responsible for the operation of the equipment.	(b) *Operation – procedures*. (1) Section 1926.1417 (Operation) applies except for § 1926.1417(c) (Accessibility of procedures). (2) *Load chart contents*. Load charts must contain at least the following information: (i) Rated capacity at corresponding ranges of boom angle or operating radii. (ii) Specific lengths of components to which the rated capacities apply. (iii) Required parts for hoist reeving. (iv) Size and construction of rope must be included on the load chart or in the operating manual. (3) *Load chart location*. (i) *Permanent installations*. For permanently installed derricks with fixed lengths of boom, guy, and mast, a load chart must be posted where it is visible to personnel responsible for the operation of the equipment. (ii) *Non-permanent installations*. For derricks that are not permanently installed, the load chart must be readily available at the job site to personnel responsible for the operation of the equipment.	**Operations for derricks is covered in WAC 296-155-54320.** **Load chart for derricks is covered in WAC 296-155-53400 in the general section.** (6) The procedures applicable to the operation of the crane/derrick including a legible and applicable operator's manual and load rating chart, written in the English language with customary grammar and punctuation, must be in the operator's cab or station when the crane is in operation. Where rated capacities are available in the cab only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.
(c) Construction. (1) General requirements. (i) Derricks shall be constructed to meet all stresses imposed on members and components when installed and operated in	(c) Construction. (1) *General requirements*. (i) Derricks must be constructed to meet all stresses imposed on members and components when installed and operated in	(3) Derricks must be constructed to meet all stresses imposed on members and components when installed and operated in accordance with the manufacturer's/ builder's procedures and within its rated capacity.

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accordance with the manufacturer's/ builder's procedures and within its rated capacity. (ii) Welding of load sustaining members shall conform to recommended practices in ANSI/AWS D14.3-94 or D1.1-02.	accordance with the manufacturer's/ builder's procedures and within its rated capacity. (ii) Welding of load sustaining members must conform to recommended practices in ANSI/AWS D14.3-94 (incorporated by reference, see § 1926.6) or AWS D1.1/D1.1M:2002 (incorporated by reference, see § 1926.6).	(28) All welding procedures and welding operator qualifications for use in repair or alteration of load sustaining members must be in accordance with ANSI/AWS D14.3 or ANSI/AWS D1.1. Where special steels or other materials are used, the manufacturer or a qualified person must provide welding procedure instructions. The type of metal used for load sustaining members must be identified by the manufacturer. In the absence of the manufacturer an RPSE must be used.
(2) Guy derricks. (i) The minimum number of guys shall be 6, with equal spacing, except where a qualified person or derrick manufacturer approves variations from these requirements and revises the rated capacity to compensate for such variations. (ii) Guy derricks shall not be used unless the employer has the following guy information: (A) The number of guys. (B) The spacing around the mast. (C) The size, grade, and construction of rope to be used for each guy. (iii) For guy derricks manufactured after December 18, 1970, in addition to the information required in paragraph (c)(2)(ii) of this section, the employer shall have the following guy information: (A) The amount of initial sag or tension. (B) The amount of tension in guy line rope at anchor. (iv) The mast base shall permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (v) The mast cap shall: (A) Permit the mast to rotate freely. (B) Withstand tilting and cramping caused by the guy loads.	(2) *Guy derricks*. (i) The minimum number of guys must be 6, with equal spacing, except where a qualified person or derrick manufacturer approves variations from these requirements and revises the rated capacity to compensate for such variations. (ii) Guy derricks must not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (A) The number of guys. (B) The spacing around the mast. (C) The size, grade, and construction of rope to be used for each guy. (iii) For guy derricks manufactured after December 18, 1970, in addition to the information required in paragraph (c)(2)(ii) of this section, the employer must have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (A) The amount of initial sag or tension. (B) The amount of tension in guy line rope at anchor. (iv) The mast base must permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (v) The mast cap must:	(1) Guy derricks. (a) The minimum number of guys must be six, with equal spacing, except where a qualified person or derrick manufacturer approves variations from these requirements and revises the rated capacity to compensate for such variations. (b) Guy derricks must not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (i) The number of guys. (ii) The spacing around the mast. (iii) The size, grade, and construction of rope to be used for each guy. (c) For guy derricks manufactured after December 18, 1970, in addition to the information required in subsection (1)(b) of this section, the employer must have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (i) The amount of initial sag or tension. (ii) The amount of tension in guy line rope at anchor. (d) The mast base must permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (e) The mast cap must:

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(C) Be secured to the mast to prevent disengagement during erection. (D) Be provided with means for attaching guy ropes.	(A) Permit the mast to rotate freely. (B) Withstand tilting and cramping caused by the guy loads. (C) Be secured to the mast to prevent disengagement during erection. (D) Be provided with means for attaching guy ropes.	(i) Permit the mast to rotate freely. (ii) Withstand tilting and cramping caused by the guy loads. (iii) Be secured to the mast to prevent disengagement during erection. (iv) Be provided with means for attaching guy ropes.
(3) Stiffleg derricks. (i) The mast shall be supported in the vertical position by at least two stifflegs; one end of each shall be connected to the top of the mast and the other end securely anchored. (ii) The stifflegs shall be capable of withstanding the loads imposed at any point of operation within the load chart range. (iii) The mast base shall: (A) Permit the mast to rotate freely (when necessary). (B) Permit deflection of the mast without binding. (iv) The mast shall be prevented from lifting out of its socket when the mast is in tension. (v) The stiffleg connecting member at the top of the mast shall: (A) Permit the mast to rotate freely (when necessary). (B) Withstand the loads imposed by the action of the stifflegs. (C) Be secured so as to oppose separating forces.	(3) *Stiffleg derricks*. (i) The mast must be supported in the vertical position by at least two stifflegs; one end of each must be connected to the top of the mast and the other end securely anchored. (ii) The stifflegs must be capable of withstanding the loads imposed at any point of operation within the load chart range. (iii) The mast base must: (A) Permit the mast to rotate freely (when necessary). (B) Permit deflection of the mast without binding. (iv) The mast must be prevented from lifting out of its socket when the mast is in tension. (v) The stiffleg connecting member at the top of the mast must: (A) Permit the mast to rotate freely (when necessary). (B) Withstand the loads imposed by the action of the stifflegs. (C) Be secured so as to oppose separating forces.	(2) Stiffleg derricks. (a) The mast must be supported in the vertical position by at least two stifflegs; one end of each must be connected to the top of the mast and the other end securely anchored. (b) The stifflegs must be capable of withstanding the loads imposed at any point of operation within the load chart range. (c) The mast base must: (i) Permit the mast to rotate freely (when necessary). (ii) Permit deflection of the mast without binding. (d) The mast must be prevented from lifting out of its socket when the mast is in tension. (e) The stiffleg connecting member at the top of the mast must: (i) Permit the mast to rotate freely (when necessary). (ii) Withstand the loads imposed by the action of the stifflegs. (iii) Be secured so as to oppose separating forces.
(4) Gin pole derricks. (i) Guy lines shall be sized and spaced so as to make the gin pole stable in both boomed and vertical positions. Exception: Where the size and/or spacing of guy lines do not result in the gin pole being stable in both boomed and vertical positions, the employer shall ensure that the derrick is not used in an unstable position. (ii) The base of the gin pole shall permit movement of the pole (when necessary).	(4) *Gin pole derricks*. (i) Guy lines must be sized and spaced so as to make the gin pole stable in both boomed and vertical positions. *Exception*: Where the size and/or spacing of guy lines do not result in the gin pole being stable in both boomed and vertical positions, the employer must ensure that the derrick is not used in an unstable position. (ii) The base of the gin pole must permit movement of the pole (when necessary).	(3) Gin pole derricks. (a) Guy lines must be sized and spaced so as to make the gin pole stable in both boomed and vertical positions. **Exception:** Where the size and/or spacing of guy lines do not result in the gin pole being stable in both boomed and vertical positions, the employer must ensure that the derrick is not used in an unstable position. (b) The base of the gin pole must permit movement of the pole (when necessary).

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(iii) The gin pole shall be anchored at the base against horizontal forces (when such forces are present).	(iii) The gin pole must be anchored at the base against horizontal forces (when such forces are present).	(c) The gin pole must be anchored at the base against horizontal forces (when such forces are present).
(5) Chicago boom derricks. The fittings for stepping the boom and for attaching the topping lift shall be arranged to: (i) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (ii) Accommodate attachment to the upright member of the host structure. (iii) Withstand the forces applied when configured and operated in accordance with the manufacturer's/ builder's procedures and within its rated capacity. (iv) Prevent the boom or topping lift from lifting out under tensile forces.	(5) *Chicago boom derricks*. The fittings for stepping the boom and for attaching the topping lift must be arranged to: (i) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (ii) Accommodate attachment to the upright member of the host structure. (iii) Withstand the forces applied when configured and operated in accordance with the manufacturer's/ builder's procedures and within its rated capacity. (iv) Prevent the boom or topping lift from lifting out under tensile forces.	(4) Chicago boom derricks. The fittings for stepping the boom and for attaching the topping lift must be arranged to: (a) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (b) Accommodate attachment to the upright member of the host structure. (c) Withstand the forces applied when configured and operated in accordance with the manufacturer's/ builder's procedures and within its rated capacity. (d) Prevent the boom or topping lift from lifting out under tensile forces.
(d) Anchoring and guying. (1) Load anchoring data developed by the manufacturer or a qualified person shall be used. (2) Guy derricks. (i) The mast base shall be anchored. (ii) The guys shall be secured to the ground or other firm anchorage. (iii) The anchorage and guying shall be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular guy slope and spacing specified for the application.	(d) *Anchoring and guying*. (1) Load anchoring data developed by the manufacturer or a qualified person must be used. (2) *Guy derricks*. (i) The mast base must be anchored. (ii) The guys must be secured to the ground or other firm anchorage. (iii) The anchorage and guying must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular guy slope and spacing specified for the application.	(5) Anchoring and guying. (a) Load anchoring data developed by the manufacturer or a registered professional engineer must be used. (b) Guy derricks. (i) The mast base must be anchored per the manufacturer's recommendations. In the absence of the manufacturer's recommendations an RPSE must be used. (ii) The guys must be secured to the ground or other firm anchorage. (iii) The anchorage and guying must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular guy slope and spacing specified for the application.
(3) Stiffleg derricks. (i) The mast base and stifflegs shall be anchored. (ii) The mast base and stifflegs shall be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the	(3) *Stiffleg derricks*. (i) The mast base and stifflegs must be anchored. (ii) The mast base and stifflegs must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the	(c) Stiffleg derricks. (i) The mast base and stifflegs must be anchored per the manufacturer's recommendations. In the absence of the manufacturer's recommendations an RPSE must be used. (ii) The mast base and stifflegs must be designed to

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particular stiffleg spacing and slope specified for the application.	particular stiffleg spacing and slope specified for the application.	withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular stiffleg spacing and slope specified for the application.
		(d) Gin pole derricks. (i) Side guys must be located so that they do not usurp the topping-lifted load; (ii) Side guys must be evenly played out or in depending on their position relative to the boom foot pivot.
(e) Swingers and hoists. (1) The boom, swinger mechanisms and hoists shall be suitable for the derrick work intended and shall be anchored to prevent displacement from the imposed loads.	(e) *Swingers and hoists*. (1) The boom, swinger mechanisms and hoists must be suitable for the derrick work intended and must be anchored to prevent displacement from the imposed loads.	(6) Swingers and hoists. (a) The boom, slewing mechanism, and hoists must be suitable for the derrick work intended and must be anchored to prevent displacement from the imposed loads.
(2) ~~Base-mounted drum~~ hoists. (i) Base mounted drum hoists shall meet the requirements in the following sections of ASME B30.7-2001: (A) Sections 7-1.1 (Load ratings and markings). (B) Section 7-1.2 (Construction), except: 7-1.2.13 (Operator's cab); 7-1.2.15 (Fire extinguishers). (C) Section 7-1.3 (Installation). (D) Applicable terms in section 7-0.2 (Definitions). (ii) Load tests for new hoists. The employer shall ensure that new hoists are load tested to a minimum of 110% of rated capacity, but not more than 125% of rated capacity, unless otherwise recommended by the manufacturer. This requirement is met where the manufacturer has conducted this testing. (iii) Repaired or modified hoists. Hoists that have had repairs, modifications or additions affecting their capacity or safe operation shall be evaluated by a qualified person to determine if a load test is necessary. If it is, load testing shall be conducted in accordance with paragraphs (e)(2)(ii)	(2) *Hoists*. (i) Base mounted drum hoists must meet the requirements in the following sections of ASME B30.7-2001 (incorporated by reference, see § 1926.6): (A) Sections 7-1.1 ("Load ratings and markings"). (B) Section 7-1.2 ("Construction"), except: 7-1.2.13 ("Operator's cab"); 7-1.2.15 ("Fire extinguishers"). (C) Section 7-1.3 ("Installation"). (D) Applicable terms in section 7-0.2 ("Definitions"). (ii) *Load tests for new hoists*. The employer must ensure that new hoists are load tested to a minimum of 110% of rated capacity, but not more than 125% of rated capacity, unless otherwise recommended by the manufacturer. This requirement is met where the manufacturer has conducted this testing. (iii) *Repaired or modified hoists*. Hoists that have had repairs, modifications or additions affecting their capacity or safe operation must be evaluated by a qualified person to determine if a load test is necessary. If it is, load testing	(b) Base-mounted drum hoists. (i) Base mounted drum hoists must meet the requirements of ASME B30.7, 2006, including the following: (A) Load ratings must be the manufacturer's recommended single rope pull in pounds (kilograms), at a specified rate of speed, on a given size drum, and prescribed number of layers of rope. (B) Markings. Hoists are to be marked with the following identification for each drum: (I) Load rating; (II) Drum size consisting of barrel diameter, barrel length, and flange diameter; (III) Rope size(s); (IV) Rope speed in feet per minute (meters per second); (V) Rated power supply. (C) Attachments and anchorages for hoist bases must provide mounting of the hoist and must be capable of withstanding loads imposed by the hoist under operating conditions. The weight of the hoist and loads imposed by

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and (iv) of this section. (iv) Load test procedure. Load tests required by paragraphs (e)(2)(ii) or (e)(2)(iii) of this section shall be conducted as follows: (A) The test load shall be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s). (B) The test load shall be lowered, stopped and held with the brake(s). (C) The hoist shall not be used unless a competent person determines that the test has been passed.	must be conducted in accordance with paragraphs (e)(2)(ii) and (iv) of this section. (iv) *Load test procedure*. Load tests required by paragraphs (e)(2)(ii) or (e)(2)(iii) of this section must be conducted as follows: (A) The test load must be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s). (B) The test load must be lowered, stopped and held with the brake(s). (C) The hoist must not be used unless a competent person determines that the test has been passed.	the load ropes must be provided for. (D) Location of drum hoists. Drum hoists must be located in a manner that provides proper rope spooling on the drums.
(f) Operational aids. (1) Section 1926.1416 (Operational aids) applies, except for Sec. 1926.1416 (d)(1) (Boom hoist limiting device) and Sec. 1926.1416(e)(1) (Boom angle or radius indicator) and Sec. 1926.1416(e)(4) (Load weighing and similar devices). (2) Boom angle aid. The employer shall ensure that either: (i) The boom hoist cable shall be marked with caution and stop marks. The stop marks shall correspond to maximum and minimum allowable boom angles. The caution and stop marks shall be in view of the operator, or a spotter who is in direct communication with the operator, or (ii) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement, is used. (3) Load weight/capacity devices. Derricks manufactured more than one year after the effective date of this standard with a maximum rated capacity over 6,000 pounds shall have at least one of the following: load weighing device, load moment indicator, rated capacity indicator, or rated	(f) *Operational aids*. (1) Section 1926.1416 (Operational aids) applies, except for § 1926.1416(d)(1) (Boom hoist limiting device), § 1926.1416(e)(1) (Boom angle or radius indicator), and § 1926.1416(e)(4) (Load weighing and similar devices). (2) *Boom angle aid*. A boom angle indicator is not required but if the derrick is not equipped with a functioning one, the employer must ensure that either: (i) The boom hoist cable must be marked with caution and stop marks. The stop marks must correspond to maximum and minimum allowable boom angles. The caution and stop marks must be in view of the operator, or a spotter who is in direct communication with the operator; or (ii) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement, is used. (3) *Load weight/capacity devices*. (i) Derricks manufactured more than one year after [INSERT DATE 90 DAYS AFTER DATE OF	(27) Operational aids. The devices listed in this subsection ("operational aids"), where equipped, are required on all derricks covered by this part, unless otherwise specified. (a) Derrick operations must not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternatives measures. More protective alternative measures specified by the derrick manufacturer, if any, must be followed. (b) If an operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under WAC 296-155-53400(60) and (61). (c) Category I operational aids and alternative measures. Operational aids listed in this subsection that are not working properly must be repaired no later than seven days after the deficiency occurs. Exception: If the employer documents that it has ordered the

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capacity limiter. Temporary alternative measures: The weight of the load shall be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information shall be provided to the operator prior to the lift.	PUBLICATION IN THE FEDERAL REGISTER] with a maximum rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter. *Temporary alternative measures*: The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift. See § 1926.1417(j) for additional requirements. (ii) A load weight/capacity device that is not working properly must be repaired no later than 30 days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 days, the repair must be completed within 7 days of receipt of the parts.	necessary parts within seven days of the occurrence of the deficiency, the repair must be completed within seven days of the receipt of the parts. (i) Boom hoist limiting device. The range of the boom must be limited at the minimum and maximum radius. Temporary alternatives measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter. (ii) Anti two-blocking device. The derrick must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. (iii) Hoist drum lower limiting device. Derricks manufactured more than one year after the effective date of this section must be equipped with a device that prevents the last two wraps of hoist cable from being spooled off the drum. Temporary alternative measures: Mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last two wraps of hoist cable being spooled off the drum, or use a spotter. (iv) Load moment limiting device. The derrick must have a device that prevents moment overloading. Temporary alternative measures: A radius indicating device must be used (if the derrick is not equipped with a radius indicating

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		device, the radius must be measured to ensure the load is within the rated capacity of the derrick). In addition, the weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift. (v) Boom hoist drum positive locking device. The boom hoist drum must be equipped with a device to positively lock the boom hoist drum. Temporary alternative measures: The device must be manually set when required if an electric, hydraulic or automatic type is not functioning. (d) Category II operational aids and alternative measures. Operational aids listed in this subsection that are not working properly must be repaired no later than thirty days after the deficiency occurs. Exception: If the employer documents that is has ordered the necessary parts within seven days of the occurrence of the deficiency, and the part is not received in time to complete the repair in thirty days, the repair must be completed within seven days of receipt of the parts. (i) Boom angle or hook radius indicator. (A) Luffing boom derricks must have a boom angle indicator readable from the operator's station. (B) Hammerhead derricks manufactured after the effective date of this section must have a hook radius indicator readable from the operator's station. Temporary alternative measures: Hook radii or boom angle must be determined by measuring the hook radii or boom angle with a measuring device. (ii) Boom angle aid. The employer must ensure that either:

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		(A) The boom hoist wire rope must be marked with caution and stop marks. The stop marks must correspond to maximum and minimum allowable boom angles. The caution and stop marks must be in view of the operator, or a spotter who is in direct communication with the operator, or (B) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement when in use. (iii) Load hoist deceleration device. The load speed must be automatically reduced prior to the hoist reaching the upper limit. Temporary alternative measures: The operator must reduce the hoist speed when approaching the upper limit. (iv) Wind speed indicator. A device must be provided to display the wind speed and must be mounted at or near the top of the derrick structure. Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another derrick on the same site, or a qualified person estimates the wind speed. (v) Load indicating device. Derricks manufactured more than one year after the effective date of this section, must have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. Temporary alternative measures: The weight of the load must be determined from a reliable source (such as the load's manufacturer), by a reliable calculation method (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.
(g) Post-assembly approval and testing--new or reinstalled	(g) *Post-assembly approval and testing – new or reinstalled*	**WAC 296-155-53212 (Phase I)**

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derricks. (1) Anchorages. (i) Anchorages, including the structure to which the derrick is attached (if applicable), shall be approved by a qualified person. (ii) If using a rock or hairpin anchorage, the qualified person shall determine if any special testing of the anchorage is needed. If so, it shall be tested accordingly. (2) Functional test. Prior to initial use, new or reinstalled derricks shall be tested by a competent person with no hook load to verify proper operation. This test shall include: (i) Lifting and lowering the hook(s) through the full range of hook travel. (ii) Raising and lowering the boom through the full range of boom travel. (iii) Swinging in each direction through the full range of swing. (iv) Actuating the anti two-block and boom hoist limit devices (if provided). (v) Actuating locking, limiting and indicating devices (if provided). (3) Load test. Prior to initial use, new or reinstalled derricks shall be load tested by a competent person. The test load shall meet the following requirements: (i) Test loads shall be at least 100% and no more than 110% of the rated capacity, unless otherwise recommended by the manufacturer or qualified person, but in no event shall the test load be less than the maximum anticipated load. (ii) The test shall consist of: (A) Hoisting the test load a few inches and holding to verify that the load is supported by the derrick and held by the hoist brake(s).	*derricks*. (1) *Anchorages*. (i) Anchorages, including the structure to which the derrick is attached (if applicable), must be approved by a qualified person. (ii) If using a rock or hairpin anchorage, the qualified person must determine if any special testing of the anchorage is needed. If so, it must be tested accordingly. (2) *Functional test*. Prior to initial use, new or reinstalled derricks must be tested by a competent person with no hook load to verify proper operation. This test must include: (i) Lifting and lowering the hook(s) through the full range of hook travel. (ii) Raising and lowering the boom through the full range of boom travel. (iii) Swinging in each direction through the full range of swing. (iv) Actuating the anti two-block and boom hoist limit devices (if provided). (v) Actuating locking, limiting and indicating devices (if provided). (3) *Load test*. Prior to initial use, new or reinstalled derricks must be load tested by a competent person. The test load must meet the following requirements: (i) Test loads must be at least 100% and no more than 110% of the rated capacity, unless otherwise recommended by the manufacturer or qualified person, but in no event must the test load be less than the maximum anticipated load. (ii) The test must consist of: (A) Hoisting the test load a few inches and holding to verify that the load is supported by the derrick and held by the hoist brake(s).	

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(B) Swinging the derrick, if applicable, the full range of its swing, at the maximum allowable working radius for the test load. (C) Booming the derrick up and down within the allowable working radius for the test load. (D) Lowering, stopping and holding the load with the brake(s). (iii) The derrick shall not be used unless the competent person determines that the test has been passed. (4) Documentation. Tests conducted under this paragraph shall be documented. The document shall contain the date, test results and the name of the tester. The document shall be retained until the derrick is re-tested or dismantled, whichever occurs first.	(B) Swinging the derrick, if applicable, the full range of its swing, at the maximum allowable working radius for the test load. (C) Booming the derrick up and down within the allowable working radius for the test load. (D) Lowering, stopping and holding the load with the brake(s). (iii) The derrick must not be used unless the competent person determines that the test has been passed. (4) *Documentation*. Tests conducted under this paragraph must be documented. The document must contain the date, test results and the name of the tester. The document must be retained until the derrick is re-tested or dismantled, whichever occurs first. All such documents must be available, during the applicable document retention period, to all persons who conduct inspections in accordance with § 1926.1412.	
(h) Load testing repaired or modified derricks. Derricks that have had repairs, modifications or additions affecting the derrick's capacity or safe operation shall be evaluated by a qualified person to determine if a load test is necessary. If it is, load testing shall be conducted and documented in accordance with paragraph (g) of this section.	(h) *Load testing repaired or modified derricks*. Derricks that have had repairs, modifications or additions affecting the derrick's capacity or safe operation must be evaluated by a qualified person to determine if a load test is necessary. If it is, load testing must be conducted and documented in accordance with paragraph (g) of this section.	**WAC 296-155-53212 (Phase I)**
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Power failure procedures. If power fails during operations, the derrick operator shall safely stop operations. This shall include: (1) Setting all brakes or locking devices. (2) Moving all clutch and other power controls to the off position.	(j) *Power failure procedures*. If power fails during operations, the derrick operator must safely stop operations. This must include: (1) Setting all brakes or locking devices. (2) Moving all clutch and other power controls to the off position.	**WAC 296-155-54320** (4) If power fails during operation, the derrick hoist operator must: (a) If practical, the suspended load must be landed under brake control, according to the manufacturer's procedures or an RPE; (b) Set all brakes or locking devices; (c) Move all clutch or other power controls to the "off"

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		position.
(k) Use of winch heads. (1) Ropes shall not be handled on a winch head without the knowledge of the operator. (2) While a winch head is being used, the operator shall be within reach of the power unit control lever.	(k) *Use of winch heads*. (1) Ropes must not be handled on a winch head without the knowledge of the operator. (2) While a winch head is being used, the operator must be within reach of the power unit control lever.	**WAC 296-155-54320** (9) Use of winch heads. (a) Ropes must not be handled on a winch head without the knowledge of the operator. (b) While a winch head is being used, the operator must be within reach of the power unit control lever.
(l) [Reserved.]	(l) [*Reserved*.]	
(m) Securing the boom. (1) When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanisms on the boom hoist shall be engaged. (2) When taken out of service for 30 days or more, the boom shall be secured by one of the following methods: (i) Laid down. (ii) Secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block. (iii) For guy derricks, lifted to a vertical position and secured to the mast. (iv) For stiffleg derricks, secured against the stiffleg.	(m) *Securing the boom*. (1) When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanisms on the boom hoist must be engaged. (2) When taken out of service for 30 days or more, the boom must be secured by one of the following methods: (i) Laid down. (ii) Secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block. (iii) For guy derricks, lifted to a vertical position and secured to the mast. (iv) For stiffleg derricks, secured against the stiffleg.	**WAC 296-155-54320** (10) Securing the derrick. (a)When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanisms on the boom hoist must be engaged. (b) When taken out of service for thirty days or more, the derrick must be secured according to the manufacturer's recommendations. In the absence of the manufacturer's recommendations an RPE must be used.
(n) The process of jumping the derrick shall be supervised by the A/D supervisor.	(n) The process of jumping the derrick must be supervised by the A/D director.	**WAC 296-155-53402** (2) Supervision--competent-qualified person. (a) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons ("assembly/disassembly director"). (b) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this part, that person is considered the assembly/disassembly

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		director.
(o) Derrick operations shall be supervised by a competent person.	(o) Derrick operations must be supervised by a competent person.	Washington requires certified operators for derricks, therefore a competent person supervising a qualified/certified derrick operator is more effective then OSHA.
(p) Inspections. In addition to the requirements in Sec. 1926.1412, the following additional items shall be included in the inspections: (1) Daily: Guys for proper tension. (2) Annual. (i) Gudgeon pin for cracks, wear, and distortion. (ii) Foundation supports for continued ability to sustain the imposed loads.	(p) *Inspections*. In addition to the requirements in § 1926.1412, the following additional items must be included in the inspections: (1) *Daily*: Guys for proper tension. (2) *Annual*. (i) Gudgeon pin for cracks, wear, and distortion. (ii) Foundation supports for continued ability to sustain the imposed loads.	**WAC 296-155-53405 Inspections.** (2) A competent person must begin a visual inspection prior to each shift the crane will be used, which must be completed before or during that shift. The inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart crane components or booming down is needed. Determinations made in conducting the inspection must be reassessed in light of observations made during operation. At a minimum, the inspection must include all of the following: **(o) Derricks must have guys inspected for proper tension.** **WAC 296-155-53212 Additional inspection criteria and proof load testing--Derricks.** (1) After it is determined that the derrick configurations meet the criteria in WAC 296-155-53200, the accredited derrick certifier must visually inspect the following items, if applicable, on derricks for sound physical condition and that they are functional within the manufacturer's recommendations (not including removal of inspection covers): (k) Gudgeon pin for cracks, wear and distortion; (l) Foundation or supports for continued ability to

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		sustain the imposed loads;
(q) Section 1926.1427 (Operator qualification and certification) does not apply.	(q) *Qualification and Training*. The employer must train each operator of a derrick on the safe operation of equipment the individual will operate. Section 1926.1427 of this subpart (Operator qualification and certification) does not apply.	Washington requires certified operators for derricks, therefore DOSH is more effective then OSHA.
Sec. 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.	**§ 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.**	**WAC 296-155-54400 Floating cranes/derricks and land cranes/derricks on barges.**
(a) This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation (vessel/flotation device); all sections of this subpart apply to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation, unless specified otherwise. The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river/lake/sea bed and the barge is fully supported by the jacks.	(a) This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation (i.e., vessel/flotation device). The sections of this subpart apply to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation, unless specified otherwise. The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river, lake, or sea bed and the barge is fully supported by the jacks.	(1) This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation (i.e., vessel/flotation device). The sections of this part apply to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation, unless specified otherwise. The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river, lake, or sea bed and the barge is fully supported by the jacks.
(b) General requirements. The requirements in paragraphs (c) through (k) of this section apply to both floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	(b) *General requirements*. The requirements in paragraphs (c) through (k) of this section apply to both floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	(2) General requirements. The requirements in paragraphs (3) through (10) of this section apply to both floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.
(c) Work area control. (1) The requirements of Sec. 1926.1424 (Work area control) apply, except for Sec. 1926.1416 (a)(2)(ii). (2) The employer shall either: (i) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas, or (ii) The hazard areas shall be clearly marked by a combination of warning signs (such as "Danger--Swing/Crush Zone" ~~or "Danger--This Thing's Gonna Swing~~	(c) *Work area control*. (1) The requirements of § 1926.1424 (Work area control) apply, except for § 1926.1424(a)(2)(ii). (2) The employer must either: (i) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or (ii) Clearly mark the hazard areas by a combination of warning signs (such as, "Danger – Swing/Crush Zone") and high visibility markings on the equipment that identify the	(3) Work area control. (a) The requirements of WAC 296-155-53400(42) (Work area control) apply, except for WAC 296-155-53400(42)(b)(ii). (b) The employer must either: (i) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or (ii) Clearly mark the hazard areas by a combination of warning signs (such as, "Danger – Swing/Crush Zone") and

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~~and Crunch You - Zone"~~) and high visibility markings on the equipment that identify the hazard areas. In addition, the employer shall train the employees to understand what these markings signify.	hazard areas. In addition, the employer must train each employee to understand what these markings signify.	high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.
(d) Keeping clear of the load. Section 1926.1425 does not apply.	(d) *Keeping clear of the load*. Section 1926.1425 does not apply.	(4) Keeping clear of the load. WAC 296-155-53400(43) does not apply.
(e) Additional Safety devices. In addition to the safety devices listed in Sec. 1926.1415, the following safety devices are required: (1) Barge, pontoon, vessel or other means of flotation list and trim device. This shall be located in the cab or, where there is no cab, at the operator's station. ~~(2) Horn.~~ (3) Positive equipment house lock. (4) Wind speed and direction indicator. A competent person shall determine if wind is a factor that needs to be considered; if it needs to be considered, a wind speed and direction indicator shall be used.	(e) *Additional safety devices*. In addition to the safety devices listed in § 1926.1415, the following safety devices are required: (1) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device must be located in the cab or, when there is no cab, at the operator's station. (2) Positive equipment house lock. (3) *Wind speed and direction indicator*. A competent person must determine if wind is a factor that needs to be considered; if wind needs to be considered, a wind speed and direction indicator must be used.	(5) Additional safety devices. In addition to the safety devices listed in WAC 296-155-53410, the following safety devices are required: (a) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device must be located in the cab or, when there is no cab, at the operator's station. (b) Positive equipment house lock. (c) Wind speed and direction indicator. A competent person must determine if wind is a factor that needs to be considered; if wind needs to be considered, a wind speed and direction indicator must be used.
(f) Operational aids. (1) An anti two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft. (2) Section 1926.1416(e)(4) (load weighing and similar devices) does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work.	(f) *Operational aids*. (1) An anti two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft. (2) Section 1926.1416(e)(4) (Load weighing and similar devices) does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work performed under this section.	(6) Operational aids. (a) An anti two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft. (b) WAC 296-155-53412(5)(d) (Load weighing and similar devices) does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work performed under this section.
(g) Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of Sec. 1926.1417(c) apply. If the crane/derrick does not have a cab: (1) Rated capacities (load charts) ~~shall be~~ posted at the operator's station. If the operator's station is moveable (such	(g) *Accessibility of procedures applicable to equipment operation*. If the crane/derrick has a cab, the requirements of § 1926.1417(c) apply. If the crane/derrick does not have a cab, the employer must ensure that: (1) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with	(7) Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of WAC 296-155-53400(6) apply. If the crane/derrick does not have a cab, the employer must ensure that: (a) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with

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as with pendant-controlled equipment), the load charts ~~shall be~~ posted on the equipment. (2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, shall be readily available on board.	pendant-controlled equipment), the load charts are posted on the equipment. (2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, must be readily available on board the vessel/flotation device.	pendant-controlled equipment), the load charts are posted on the equipment. (b) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, must be readily available on board the vessel/flotation device.
(h) Inspections. In addition to meeting the requirements of Sec. 1926.1412 for inspecting the crane/derrick, the employer ~~shall ensure that~~ the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick ~~is inspected as follows~~: (1) Shift. The means used to secure/attach the equipment to the vessel/flotation device ~~shall be inspected~~ for proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (where applicable) insufficient tension. (2) Monthly. ~~The vessel/ flotation device used shall be inspected for the following:~~ (i) The means used to secure/attach the equipment to the vessel/flotation device ~~shall be inspected~~ for proper condition, including wear, corrosion and (where applicable) insufficient tension. (ii) Taking on water. (iii) Deckload for proper securing. (iv) Chain lockers, storage, fuel compartments and ~~battening of~~ hatches for serviceability as a water-tight appliance. (v) Firefighting and lifesaving equipment in place and functional (3) The shift and monthly inspections ~~shall be~~ conducted by a competent person. If any deficiency is identified, an immediate determination shall be made by a qualified	(h) *Inspections*. In addition to meeting the requirements of § 1926.1412 for inspecting the crane/derrick, the employer must inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick, and ensure that: (1) *Shift*. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension. (2) *Monthly*. For each monthly inspection: (i) The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension. (ii) The vessel/flotation device is not taking on water. (iii) The deckload is properly secured. (iv) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (v) The firefighting and lifesaving equipment is in place and functional. (3) The shift and monthly inspections are conducted by a competent person, and: (i) If any deficiency is identified, an immediate	(8) Inspections. In addition to meeting the requirements of WAC 296-155-53405 for inspecting the crane/derrick, the employer must inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick, and ensure that: (a) Shift. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension. (b) Monthly. For each monthly inspection: (i) The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension. (ii) The vessel/flotation device is not taking on water. (iii) The deck load is properly secured. (iv) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (v) The firefighting and lifesaving equipment is in place and functional. (c) The shift and monthly inspections are conducted by a competent person, and: (i) If any deficiency is identified, an immediate

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person as to whether the deficiency constitutes a hazard. If the deficiency is determined to constitute a hazard, the vessel/flotation device shall be removed from service until it has been corrected.	determination is made by a qualified person whether the deficiency constitutes a hazard. (ii) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.	determination is made by a qualified person whether the deficiency constitutes a hazard. (ii) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.
(4) Annual: External vessel/flotation device inspection. (i) The external portion of the barge, pontoons, vessel or other means of flotation used shall be inspected annually by a qualified person who has expertise with respect to vessels/flotation devices. The inspection shall include the following items: (A) The items identified in paragraphs (h)(1)(Shift) and (h)(2)(Monthly) of this section. (B) Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant: Corrosion, wear, deterioration, and deformation. (C) External evidence of leaks and structural damage. (D) Four-corner draft readings. (E) Firefighting equipment for serviceability. (ii) Rescue skiffs, lifelines, work vests, life preservers and ring buoys shall be inspected for proper condition. (iii) If any deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections. If the deficiency is determined to constitute a hazard, the vessel/flotation device shall be removed from service until it has been corrected. (iv) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, ~~the employer shall ensure that~~ the deficiency is checked in the monthly inspections.	(4) *Annual: external vessel/flotation device inspection*. For each annual inspection: (i) The external portion of the barge, pontoons, vessel or other means of flotation used is inspected annually by a qualified person who has expertise with respect to vessels/flotation devices and that the inspection includes the following items: (A) The items identified in paragraphs (h)(1) (*Shift*) and (h)(2) (*Monthly*) of this section. (B) Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items. (C) External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device. (D) Four-corner draft readings. (E) Firefighting equipment for serviceability. (ii) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition. (iii) If any deficiency is identified, an immediate determination is made by the qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections. (A) If the qualified person determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. See requirements in	(d) *Annual: external vessel/flotation device inspection*. For each annual inspection: (i) The external portion of the barge, pontoons, vessel or other means of flotation used is inspected annually by a qualified person who has expertise with respect to vessels/flotation devices and that the inspection includes the following items: (A) The items identified in subsection (8) of this section. (B) Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items. (C) External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device. (D) Four-corner draft readings. (E) Firefighting equipment for serviceability. (ii) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition. (iii) If any deficiency is identified, an immediate determination is made by the qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections. (A) If the qualified person determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. See requirements in WAC 296-155-53400(69).

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	§ 1926.1417(f). (B) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.	(B) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.
(5) Quadrennial: Internal vessel/flotation device inspection. (i) The internal portion of the barge, pontoons, vessel or other means of flotation used shall be surveyed once every 4 years by a marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices. (ii) If any deficiency is identified, an immediate determination shall be made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. (iii) If the deficiency is determined to constitute a hazard, the vessel/flotation device shall be removed from service until it has been corrected. (iv) If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, ~~the employer shall ensure that~~ the deficiency is checked in the monthly or annual inspections, as appropriate.	(5) *Four-year: internal vessel/flotation device inspection*. For each four-year inspection: (i) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation. (ii) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. (A) If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. (B) If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.	(e) Four-year: internal vessel/flotation device inspection. For each four-year inspection: (i) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation. (ii) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. (A) If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. (B) If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.
(6) Documentation. The monthly and annual inspections required in paragraphs (h)(2) and (h)(4) of this section shall be documented in accordance with Sec. 1926.1412 (e)(3) and 1926.1412(f)(7), respectively. The quadrennial inspection required in paragraph (h)(5) of this section shall be documented in accordance with Sec. 1926.1412(f)(7), except that the documentation for that inspection shall be retained for a minimum of 4 years.	(6) *Documentation*. The monthly and annual inspections required in paragraphs (h)(2) and (h)(4) of this section are documented in accordance with §§ 1926.1412 (e)(3) and 1926.1412(f)(7), respectively, and that the four-year inspection required in paragraph (h)(5) of this section is documented in accordance with § 1926.1412(f)(7), except that the documentation for that inspection must be retained for a minimum of 4 years. All such documents must be made available, during the applicable document retention period, to all persons who conduct inspections in accordance	(f) Documentation. The monthly and annual inspections required in subsection (8)(d) and (d) of this section are documented in accordance with WAC 296-155-53405, respectively, and that the four-year inspection required in subsection (8)(e) of this section is documented, except that the documentation for that inspection must be retained for a minimum of 4 years. All such documents must be made available, during the applicable document retention period, to all persons who conduct inspections in accordance with § WAC 296-155-53405.

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	with § 1926.1412.	
(i) [Reserved.]	(i) [*Reserved*.]	
(j) Working with a diver. The following additional requirements apply when working with a diver in the water: (1) If a crane/derrick is used to get a diver into and out of the water, it shall not be used for any other purpose until the diver is back on board. When used for more than one diver, it shall not be used for any other purpose until all divers are back on board. (2) The operator shall remain at the controls of the crane/derrick at all times. (3) In addition to the requirements in Sec. 1926.1419 through 1422 (Signals), either: (i) A clear line of sight shall be maintained between the operator and tender, or (ii) The signals between the operator and tender shall be transmitted electronically. (4) The means used to secure the crane/derrick to the vessel/flotation device (see paragraph (n)(5) of this section) shall not allow any amount of shifting in any direction.	(j) *Working with a diver*. The employer must meet the following additional requirements when working with a diver in the water: (1) If a crane/derrick is used to get a diver into and out of the water, it must not be used for any other purpose until the diver is back on board. When used for more than one diver, it must not be used for any other purpose until all divers are back on board. (2) The operator must remain at the controls of the crane/derrick at all times. (3) In addition to the requirements in §§ 1926.1419 through 1926.1422 (Signals), either: (i) A clear line of sight must be maintained between the operator and tender; or (ii) The signals between the operator and tender must be transmitted electronically. (4) The means used to secure the crane/derrick to the vessel/flotation device (see paragraph (n)(5) of this section) must not allow any amount of shifting in any direction.	(9) Working with a diver. The employer must meet the following additional requirements when working with a diver in the water: (a) If a crane/derrick is used to get a diver into and out of the water, it must not be used for any other purpose until the diver is back on board. When used for more than one diver, it must not be used for any other purpose until all divers are back on board. (b) The operator must remain at the controls of the crane/derrick at all times. (c) In addition to the requirements in WAC 296-155-53406 (Signals), either: (i) A clear line of sight must be maintained between the operator and tender; or (ii) The signals between the operator and tender must be transmitted electronically. (d) The means used to secure the crane/derrick to the vessel/flotation device (see paragraph (12)(e) of this section) must not allow any amount of shifting in any direction.
(k) The employer shall ensure that the manufacturer's specifications and limitations with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel or other means of flotation are not exceeded or violated.	(k) Manufacturer's specifications and limitations. (1) The employer must ensure that the barge, pontoons, vessel, or other means of flotation must be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations. (2) The employer must ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (3) When the manufacturer's specifications and limitations	(10) Manufacturer's specifications and limitations. (a) The employer must ensure that the barge, pontoons, vessel, or other means of flotation must be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations. (b) The employer must ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (c) When the manufacturer's specifications and limitations

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	are unavailable, the employer must ensure that the specifications and limitations established by a qualified person with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.	are unavailable, the employer must ensure that the specifications and limitations established by a qualified person with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.
(l) [Reserved.]	(l) [*Reserved*.]	
(m) Floating cranes/derricks. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation: (1) Load charts. (i) The manufacturer load charts applicable to operations on water shall not be exceeded. When using these charts, the employer shall comply with all parameters and limitations (such as dynamic/environmental parameters) applicable to the use of the charts. (ii) The load charts shall take into consideration a minimum wind speed of 40 miles per hour. (2) The requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section shall be met.	(m) *Floating cranes/derricks*. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation: (1) *Load charts*. (i) The employer must not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer must comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts. (ii) The employer must ensure that load charts take into consideration a minimum wind speed of 40 miles per hour. (2) The employer must ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.	(11) Floating cranes/derricks. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation: (a) Load charts. (i) The employer must not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer must comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts. (ii) The employer must ensure that load charts take into consideration a minimum wind speed of 40 miles per hour. (b) The employer must ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.
TABLE M1 Maximum allowable Maximum allowable Rated capacity list trim Equipment designed for marine use by permanent attachment (other than derricks): 25 tons or less..... 5 degrees..... 5 degrees. Over 25 tons..... 7 degrees..... 7 degrees. Derricks designed for marine use by permanent attachment: Any rated capacity..... 10 degrees..... 10 degrees.	TABLE M1 *Equipment designed for marine use by permanent attachment (other than derricks)*: Rated Capacity Maximum Allowable List Maximum Allowable Trim 25 tons or less 5 degrees 5 degrees Over 25 tons 7 degrees 7 degrees *Derricks designed for marine use by permanent attachment*: Any rated capacity 10 degrees 10 degrees	Table M-1

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(3) The equipment shall be stable under the conditions specified in Tables M2 and M3 of this section.	(3) The employer must ensure that the equipment is stable under the conditions specified in Tables M2 and M3 of this section. (Note: Freeboard is the vertical distance between the water line and the main deck of the vessel.)	(c) The employer must ensure that the equipment is stable under the conditions specified in Tables M2 and M3 of this section. (Note: Freeboard is the vertical distance between the water line and the main deck of the vessel.)
TABLE M2 Minimum Operated at Wind speed freeboard (mph) (ft) Rated capacity..... 60 2 Rated capacity plus 25%..... 60 1 High boom, no load..... 60 2	TABLE M2 Operated at Wind speed Minimum freeboard Rated capacity 60 mph 2 ft Rated capacity plus 25% 60 mph 1 ft High boom, no load 60 mph 2 ft	Table M-2
TABLE M3 Operated at Wind speed For backward stability of the boom: High boom, no load, full back list (least 90 mph. stable condition).	TABLE M3 *For backward stability of the boom*: Operated at Wind speed High boom, no load, full back list (least stable condition) 90 mph	Table M-3
(4) If the equipment is employer-made, it shall not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of paragraphs (m)(1) through (3) of this section. Such documents shall be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).	(4) If the equipment is employer-made, it must not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of paragraphs (m)(1) through (3) of this section. Such documents must be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).	(d) If the equipment is employer-made, it must not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of paragraphs (11)(a) through (c) of this section. Such documents must be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).
(5) The barge, pontoons, vessel or other means of flotation used shall: (i) Be structurally sufficient to withstand the static and	(5) The employer must ensure that the barge, pontoons, vessel or other means of flotation used: (i) Are structurally sufficient to withstand the static and	(e) The employer must ensure that the barge, pontoons, vessel or other means of flotation used: (i) Are structurally sufficient to withstand the static and

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dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (iii) Have access to void compartments to allow for inspection and pumping.	dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all planned and actual deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect. (iii) Have access to void compartments to allow for inspection and pumping.	dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all planned and actual deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect. (iii) Have access to void compartments to allow for inspection and pumping.
(n) Land cranes/derricks. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation: (1) The rated capacity of the equipment (load charts) applicable for use on land shall be reduced to: (i) Account for increased loading from list, trim, wave action, and wind. (ii) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the expected environmental conditions. (iii) ~~Ensure that~~ the conditions required in paragraphs (n)(3) and (n)(4) of this section are met. (2) The rated capacity modification required in paragraph (n)(1) of this section ~~shall be done~~ by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices. (3) List and trim. (i) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation shall not exceed the amount necessary to ensure that the conditions in paragraph (n)(4) of this section are met. In addition, the maximum allowable list and the maximum allowable trim shall not exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer, or where an amount is not so	(n) *Land cranes/derricks*. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation, the employer must ensure that: (1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (i) Account for increased loading from list, trim, wave action, and wind. (ii) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered. (iii) The conditions required in paragraphs (n)(3) and (n)(4) of this section are met. (2) The rated capacity modification required in paragraph (n)(1) of this section is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices. (3) For list and trim. (i) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation must not exceed the amount necessary to ensure that the conditions in paragraph (n)(4) of this section are met. In addition, the maximum allowable list and the	(12) *Land cranes/derricks*. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation, the employer must ensure that: (a) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (i) Account for increased loading from list, trim, wave action, and wind. (ii) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered. (iii) The conditions required in subsections (12)(c) and (d) of this section are met. (b) The rated capacity modification required in subsection (12)(a) of this section is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices. (c) For list and trim. (i) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation must not exceed the amount necessary to ensure that the conditions in paragraph (12)(d) of this section are met. In addition, the maximum allowable list and the

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specified, the amount specified by the qualified person. (ii) The maximum allowable list and the maximum allowable trim for the land crane/derrick shall not exceed the amount specified by the crane/derrick manufacturer, or where an amount is not so specified, the amount specified by the qualified person. (4) The following conditions shall be met: (i) All deck surfaces of the barge, pontoons, vessel or other means of flotation used shall be above water. (ii) The entire bottom area of the barge, pontoons, vessel or other means of flotation used shall be submerged.	maximum allowable trim does not exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person. (ii) The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person. (4) For the following conditions: (i) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water. (ii) The entire bottom area of the barge, pontoons, vessel or other means of flotation used is submerged.	maximum allowable trim does not exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person. (ii) The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person. (d) For the following conditions: (i) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water. (ii) The entire bottom area of the barge, pontoons, vessel or other means of flotation used is submerged.
(5) Physical attachment, corralling, rails system and centerline cable system. ~~The employer shall~~ meet the requirements in Option (1), Option (2), Option (3), or Option (4) ~~(see paragraphs (n)(4)(i), (ii), (iii), and (iv)~~ of this section). Whichever option is used, the requirements of paragraph (v) must also be met. (i) Option (1)--Physical attachment. The crane/derrick shall be physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device ~~(this type of system allows the crane/derrick to lift up slightly from the surface of the vessel/means of flotation)~~, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment. (ii) Option (2)--Corralling. The crane/derrick shall be prevented from shifting by installing barricade restraints (a	(5) Physical attachment, corralling, rails system and centerline cable system meet the requirements in Option (1), Option (2), Option (3), or Option (4) of this section, and that whichever option is used also meets the requirements of paragraph (n)(5)(v) of this section. (i) *Option (1) – Physical attachment*. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment. (ii) *Option (2) – Corralling*. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers must ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.	(e) Physical attachment, corralling, rails system and centerline cable system meet the requirements in Option (1), Option (2), Option (3), or Option (4) of this section, and that whichever option is used also meets the requirements of subsection (12)(e)(v) of this section. (i) *Option (1) – Physical attachment*. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment. (ii) *Option (2) – Corralling*. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers must ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.

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corralling system). Corralling systems shall not allow any amount of shifting in any direction ~~by the equipment~~. (iii) Option (3)--Rails. The crane/derrick shall be prevented from shifting by being mounted on a rail system. Rail clamps and rail stops are required unless the system is designed to prevent movement during operation by other means. (iv) Option (4)--Centerline cable system. The crane/derrick shall be prevented from shifting by being mounted to a wire rope system. The wire rope system shall meet the following requirements: (A) The wire rope and attachments shall be of sufficient size/strength to support the side load of crane/derrick. (B) The wire rope shall be physically attached to the vessel/flotation device. (C) The wire rope shall be attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage which will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning. (D) Means shall be installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments. (E) The crane/derrick shall be secured from movement during operation. (v) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) ~~(see paragraphs (n)(4)(i), (ii), (iii), and (iv) of this section)~~ shall be designed by a marine engineer, registered professional ~~engineer~~ familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design.	(iii) *Option (3) – Rails*. The crane/derrick must be prevented from shifting by being mounted on a rail system. Employers must ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means. (iv) *Option (4) – Centerline cable system*. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The employer must ensure that the wire rope system meets the following requirements: (A) The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick. (B) The wire rope is attached physically to the vessel/flotation device. (C) The wire rope is attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning. (D) Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments. (E) The crane/derrick is secured from movement during operation. (v) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional with floating crane/derrick design, or qualified person familiar with floating crane/derrick design. (6) *Exception*. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by paragraph (n)(5) of this section to use Option (1), Option	(iii) *Option (3) – Rails*. The crane/derrick must be prevented from shifting by being mounted on a rail system. Employers must ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means. (iv) *Option (4) – Centerline cable system*. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The employer must ensure that the wire rope system meets the following requirements: (A) The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick. (B) The wire rope is attached physically to the vessel/flotation device. (C) The wire rope is attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning. (D) Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments. (E) The crane/derrick is secured from movement during operation. (v) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design. (f) *Exception*. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by paragraph (12)(e) of this section to use Option (1), Option

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(vi) Exception. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement to use Option (1), Option (2), Option (3), or Option (4) ~~of this section~~ does not apply where the employer demonstrates implementation of a plan and procedures that meet the following requirements: (A) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane. (B) The plan shall be designed so that the applicable requirements of this section will be met despite the position, travel, operation, and lack of physical attachment (or corralling, use of rails or cable system) of the mobile auxiliary crane. (C) The plan shall specify the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate and the parameters/ limitations of such movements and operation. (D) The deck shall be marked to identify the permitted areas for positioning, travel, and operation. (E) The plan shall specify the dynamic/environmental conditions that must be present for use of the plan. (F) If the dynamic/environmental conditions in paragraph (n)(5)(vi)(E) of this section are exceeded, the mobile auxiliary crane shall be physically attached or corralled in accordance with Option (1), Option (2) or Option (4) ~~(see paragraphs (n)(4)(i), (ii), and (iv) of this section).~~	(2), Option (3), or Option (4) does not apply when the employer demonstrates implementation of a plan and procedures that meet the following requirements: (i) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane. (ii) The plan is designed so that the applicable requirements of this section are met despite the position, travel, operation, and lack of physical attachment (or corralling, use of rails or cable system) of the mobile auxiliary crane. (iii) The plan specifies the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters and limitations of such movements and operation. (iv) The deck is marked to identify the permitted areas for positioning, travel, and operation. (v) The plan specifies the dynamic and environmental conditions that must be present for use of the plan. (vi) If the dynamic and environmental conditions in paragraph (n)(6)(v) of this section are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of paragraph (n)(5) of this section.	(2), Option (3), or Option (4) does not apply when the employer demonstrates implementation of a plan and procedures that meet the following requirements: (i) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane. (ii) The plan is designed so that the applicable requirements of this section are met despite the position, travel, operation, and lack of physical attachment (or corralling, use of rails or cable system) of the mobile auxiliary crane. (iii) The plan specifies the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters and limitations of such movements and operation. (iv) The deck is marked to identify the permitted areas for positioning, travel, and operation. (v) The plan specifies the dynamic and environmental conditions that must be present for use of the plan. (vi) If the dynamic and environmental conditions in subsection (12)(f)(v) of this section are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of subsection (12)(e) of this section.
(6) The barge, pontoons, vessel or other means of flotation used shall: (i) Be structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the	(7) The barge, pontoons, vessel or other means of flotation used: (i) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the	(g) The barge, pontoons, vessel or other means of flotation used: (i) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the

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crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (iii) Have access to void compartments to allow for inspection and pumping.	crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (iii) Have access to void compartments to allow for inspection and pumping.	crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (iii) Have access to void compartments to allow for inspection and pumping.
Sec. 1926.1438 Overhead & gantry cranes.	**§ 1926.1438 Overhead & gantry cranes.**	**WAC 296-155-542 Overhead and Bridge Cranes** **WAC 296-155-54200 Overhead and Bridge Cranes – General** **WAC 296-155-54210 Overhead and Bridge Cranes – Maintenance** **WAC 296-155-54215Overhead and Bridge Cranes – Operations**
(a) Permanently installed overhead and gantry cranes. (1) This paragraph applies to the following equipment when used in construction and permanently installed in a facility: Overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. (2) The requirements of Sec. 1910.179, except for Sec. 1910.179(b)(1), apply to the equipment identified in paragraph (a)(1) of this section.	(a) *Permanently installed overhead and gantry cranes*. The requirements of § 1910.179, except for § 1910.179(b)(1), and not the requirements of this subpart CC, apply to the following equipment when used in construction and permanently installed in a facility: overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics.	**WAC 296-155-52900 Scope.** Except as provided in paragraph (3) of this section, this part applies to power-operated cranes and derricks used in construction that can hoist, lower and horizontally move a suspended load (with or without attachments). Such equipment includes, but is not limited to: Articulating boom cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multipurpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as fixed jib ("hammerhead boom"), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; side-boom tractors; derricks; and variations of such equipment.

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(b) Overhead and gantry cranes that are not permanently installed in a facility. (1) This paragraph applies to the following equipment when used in construction and not permanently installed in a facility: Overhead and gantry cranes, overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means. (2) The following requirements apply to equipment identified in paragraph (b)(1) of this section: (i) Sections 1926.1400 through 1414; Sec. 1926.1417 through 1425; Sec. 1926.1426(d), Sec. 1926.1427 through 1434; Sec. 1926.1437, Sec. 1926.1439, and Sec. 1926.1441. (ii) The following portions of Sec. 1910.179: (A) Paragraphs (b)(5),(6),(7); (e)(1),(3),(5),(6); (f)(1),(4); (g); (h)(1),(3); (k); and (n) of Sec. 1910.179. (B) The definitions in Sec. 1910.179(a) except for "hoist" and "load." For those words, the definitions in Sec. 1926.1401 apply. (C) Section 1910.179 (b)(2) applies only to equipment identified in paragraph (b)(1) of this section manufactured before September 19, 2001. (iii) For equipment manufactured on or after September 19, 2001, the following sections of ASME B.30.2-2005 apply: 2-1.3.1; 2-1.3.2; 2-1.4.1; 2-1.6; 2-1.7.2; 2-1.8.2; 2-1.9.1; 2-1.9.2; 2-1.11; 2-1.12.2; 2-1.13.7; 2-1.14.2; 2-1.14.3; 2-1.14.5; 2-1.15.; 2-2.2.2; 2-3.2.1.1. In addition, 2-3.5 applies, except in 2-3.5.1(b), "29 CFR 1910.147" applies in place of "ANSI Z244.1."	(b) *Overhead and gantry cranes that are not permanently installed in a facility*. (1) This paragraph applies to the following equipment when used in construction and not permanently installed in a facility: overhead and gantry cranes, overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment having the same fundamental characteristics, irrespective of whether it travels on tracks, wheels, or other means. (2) The following requirements apply to equipment identified in paragraph (b)(1) of this section: (i) Sections 1926.1400 through 1926.1414; §§ 1926.1417 through 1926.1425; § 1926.1426(d), §§ 1926.1427 through 1926.1434; § 1926.1437, § 1926.1439, and § 1926.1441. (ii) The following portions of § 1910.179: (A) Paragraphs (b)(5),(6),(7); (e)(1),(3),(5),(6); (f)(1),(4); (g); (h)(1),(3); (k); and (n) of § 1910.179. (B) The definitions in § 1910.179(a) except for "hoist" and "load." For those words, the definitions in § 1926.1401 apply. (C) Section 1910.179(b)(2), but only where the equipment identified in paragraph (b)(1) of this section (§ 1926.1438) was manufactured before September 19, 2001. (iii) For equipment manufactured on or after September 19, 2001, the following sections of ASME B30.2-2005 (incorporated by reference, see § 1926.6) apply: 2-1.3.1; 2-1.3.2; 2-1.4.1; 2-1.6; 2-1.7.2; 2-1.8.2; 2- 1.9.1; 2-1.9.2; 2-1.11; 2-1.12.2; 2-1.13.7; 2-1.14.2; 2-1.14.3; 2-1.14.5; 2-1.15.; 2-2.2.2; 2-3.2.1.1. In addition, 2-3.5 applies, except in 2-3.5.1(b), "29 CFR 1910.147" is substituted for "ANSI Z244.1."	**WAC 296-155-52900 Scope.** Except as provided in paragraph (3) of this section, this part applies to power-operated cranes and derricks used in construction that can hoist, lower and horizontally move a suspended load (with or without attachments). Such equipment includes, but is not limited to: Articulating boom cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multipurpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as fixed jib ("hammerhead boom"), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; side-boom tractors; derricks; and variations of such equipment.

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Sec. 1926.1439 Dedicated pile drivers.	**§ 1926.1439 Dedicated pile drivers.**	**WAC 296-155-54405 Dedicated Pile Drivers**
(a) The provisions of this standard apply to dedicated pile drivers, except as specified in this section.	(a) The provisions of subpart CC apply to dedicated pile drivers, except as specified in this section.	(1) The provisions of Part L of this chapter apply to dedicated pile drivers, except as specified in this section.
(b) Section 1926.1416(d)(3) (anti two-block device) does not apply.	(b) Section 1926.1416(d)(3) (Anti two-blocking device) does not apply.	(2) WAC 296-155-53412(4)(c) (Anti two-blocking device) does not apply.
(c) Section 1926.1416(e)(4) (Load weight/capacity devices) applies only to dedicated pile drivers manufactured more than one year after the effective date of this standard.	(c) Section 1926.1416(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after [INSERT DATE 1 YEAR AND 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].	(3) WAC 296-155-53412(5)(d) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after the effective date of this section.
(d) In Sec. 1926.1433, only Sec. 1926.1433(e) and (f) apply to dedicated pile drivers.	(d) In § 1926.1433, only §§ 1926.1433(d) and (e) apply to dedicated pile drivers.	
~~(e) Section 1926.1427 (Operator qualification and certification) applies, except that the qualification or certification shall be for operation of either dedicated pile drivers or equipment that is the most similar to dedicated pile drivers.~~		
Sec. 1926.1440 Sideboom cranes.	**§ 1926.1440 Sideboom cranes.**	**WAC 296-155-54410 Sideboom Cranes**
(a) The provisions of this subpart apply, except Sec. 1926.1402 (Ground conditions), Sec. 1926.1415 (Safety devices), Sec. 1926.1416 (Operational aids), and Sec. 1926.1427 (Operator qualification and certification).	(a) The provisions of this standard apply, except § 1926.1402 (Ground conditions), § 1926.1415 (Safety devices), § 1926.1416 (Operational aids), and § 1926.1427 (Operator qualification and certification).	(1) The provisions of this standard apply, except WAC 296-155-53400(34) (Ground conditions), WAC 296-155-53410 (Safety devices), WAC 296-155-53412 (Operational aids), and WAC 296-155-53300 (Operator qualification and certification).
(b) Section 1926.1426 (Free fall and controlled load lowering) applies, except Sec. 1926.1426(a)(2)(i). Sideboom cranes in which the boom is designed to free fall (live boom) are permitted only if manufactured prior to [effective date of this subpart].	(b) Section 1926.1426 (Free fall and controlled load lowering) applies, except § 1926.1426(a)(2)(i). Sideboom cranes in which the boom is designed to free fall (live boom) are permitted only if manufactured prior to [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].	**WAC 296-155-53400** (34) Boom free fall prohibitions. (b) The use of cranes in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in subsection (8)(a) of this section are present and: (i) The crane was manufactured prior to October 31, 1984 (sideboom cranes in which the boom is designed to freefall is permitted only if manufactured prior to the effective date

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		of this section), or
(c) Sideboom cranes mounted on wheel or crawler tractors shall meet the following requirements of ASME B30.14-2004 (Side Boom Tractors): (1) Section 14-1.1 ("Load Ratings"). (2) Section 14-1.3 ("Side Boom Tractor Travel"). (3) Section 14-1.5 ("Ropes and Reeving Accessories"). (4) Section 14-1.7.1 ("Booms"). (5) Section 14-1.7.2 ("General Requirements--Exhaust Gases"). (6) Section 14-1.7.3 ("General Requirements--Stabilizers (Wheel-Type Side Boom Tractors)"). (7) Section 14-1.7.4 ("General Requirements--Welded Construction"). (8) Section 14-1.7.6 ("General Requirements--Clutch and Brake Protection"). (9) Section 14-2.2.2 ("Testing--Rated Load Test"), except that it applies only to equipment that has been modified or repaired. (10) In section 14-3.1.2 ("Operator Qualifications"), paragraph (a), except the phrase "When required by law." (11) In section 14-3.1.3 ("Operating Practices"), paragraphs (e), (f)(1)--(4), (6), (7); (h), and (i). (12) In section 14-3.2.3 ("Moving the Load"), paragraphs (j), (l), and (m).	(c) Sideboom cranes mounted on wheel or crawler tractors must meet all of the following requirements of ASME B30.14-2004 (incorporated by reference, see § 1926.6): (1) Section 14-1.1 ("Load Ratings"). (2) Section 14-1.3 ("Side Boom Tractor Travel"). (3) Section 14-1.5 ("Ropes and Reeving Accessories"). (4) Section 14-1.7.1 ("Booms"). (5) Section 14-1.7.2 ("General Requirements – Exhaust Gases"). (6) Section 14-1.7.3 ("General Requirements – Stabilizers (Wheel-Type Side Boom Tractors)"). (7) Section 14-1.7.4 ("General Requirements – Welded Construction"). (8) Section 14-1.7.6 ("General Requirements – Clutch and Brake Protection"). (9) Section 14-2.2.2 ("Testing – Rated Load Test"), except that it applies only to equipment that has been altered or modified. (10) In section 14-3.1.2 ("Operator Qualifications"), paragraph (a), except the phrase "When required by law." (11) In section 14-3.1.3 ("Operating Practices"), paragraphs (e), (f)(1) – (f)(4), (f)(6), (f)(7), (h), and (i). (12) In section 14-3.2.3 ("Moving the Load"), paragraphs (j), (l), and (m).	(2) Sideboom cranes manufactured prior to the effective date of this section must meet the requirements of SAE J743a-1964. Sideboom cranes mounted on wheel or crawler tractors manufactured after the effective date of this section must meet the requirements of ASME B30.14-2004.
Sec. 1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.	**§ 1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.**	**WAC 296-155-53414 Cranes/derricks with a rated hoisting/lifting capacity of 2,000 pounds or less.**
For equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less:	The following paragraphs of this section specify requirements for employers using equipment with a maximum rated hoisting/lifting capacity of 2,000 pounds or less.	For cranes/derricks with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less:
(a) The following sections of this subpart apply: Sec.	(a) The employer using this equipment must comply with	(1) The following sections of this section apply: WAC 296-

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1926.1400 (Scope); Sec. 1926.1401 (Definitions); Sec. 1926.1402 (Ground conditions); Sec. 1926.1407 through 1411 (Power line safety); Sec. 1926.1413 through 1414 (Wire rope); Sec. 1926.1418 (Authority to stop operation); Sec. 1926.1419 through 1422 (Signals); Sec. 1926.1423 (Fall protection); Sec. 1926.1426 (Free fall and controlled load lowering); Sec. 1926.1432 (Multiple crane/derrick lifts--supplemental requirements); Sec. 1926.1434 (Equipment modifications); Sec. 1926.1435 (Tower cranes); Sec. 1926.1436 (Derricks); Sec. 1926.1437 (Floating cranes/derricks and land cranes/derricks on barges); Sec. 1926.1438 (Overhead & gantry cranes). ~~Note to paragraph (a): Under paragraph (b)(1) of this section, Sec. 1926.1403 (Assembly/Disassembly--selection of manufacturer or employer procedures) and Sec. 1926.1406 (Assembly/Disassembly--employer procedures--general requirements) also apply.~~	the following provisions of this subpart: § 1926.1400 (Scope); § 1926.1401 (Definitions); § 1926.1402 (Ground conditions); § 1926.1403 (Assembly/disassembly—selection of manufacturer or employer procedures); § 1926.1406 (Assembly/disassembly—employer procedures); §§ 1926.1407 through 1926.1411 (Power line safety); § 1926.1412(c) (*Post-assembly*); §§1926.1413 through 1926.1414 (Wire rope); § 1926.1418 (Authority to stop operation); §§ 1926.1419 through 1926.1422 (Signals); § 1926.1423 (Fall protection); § 1926.1425 (Keeping clear of the load) (except for § 1926.1425(c)(3) (qualified rigger)); § 1926.1426 (Free fall and controlled load lowering); § 1926.1432 (Multiple crane/derrick lifts— supplemental requirements); § 1926.1434 (Equipment modifications); § 1926.1435 (Tower cranes); § 1926.1436 (Derricks); § 1926.1437 (Floating cranes/derricks and land cranes/derricks on barges); § 1926.1438 (Overhead & gantry cranes).	155-52900; WAC 296-155-52902; WAC 296-155-53400(34), (36), (37), (38), (45), (46), (60) and (67); WAC 296-155-53404; WAC 296-155-53406; WAC 296-155-53408; WAC 296-155-53700(7); WAC 296-155-53715(5); WAC 296-155-539; WAC 296-155-542; WAC 296-155-543. Note to subsection (1): Under subsection (2)(a) of this section, WAC 296-155-53402, (Assembly/Disassembly) also apply.
(b) Assembly/disassembly. (1) Sections 1926.1403 (Assembly/Disassembly--Selection of manufacturer or employer procedures) and 1926.1406 (Assembly/Disassembly--employer procedures) apply. (2) Components and configuration. (i) The selection of components and configuration of the equipment that affect the capacity or safe operation of the equipment must be in accordance with: (A) Manufacturer instructions, recommendations, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (B) Approved modifications that meet the requirements of	(b) *Assembly/disassembly*. (1) In addition to compliance with §§ 1926.1403 (Assembly/disassembly— selection of manufacturer or employer procedures) and 1926.1406 (Assembly/disassembly—employer procedures), the employer must also comply with § 1926.1441(b)(2)-(3). (2) *Components and configuration*. The employer must ensure that: (i) The selection of components, and the configuration of the equipment, that affect the capacity or safe operation of the equipment complies with either the: (A) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a registered professional	(2) Assembly/disassembly. (a) WAC 296-155-53402 (Assembly/Disassembly) applies. (b) Components and configuration. The employer must ensure that: (i) The selection of components and the configuration of the crane/derrick which affects the capacity or safe operation of the crane/derrick complies with either the: (A) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a registered professional engineer familiar with the type of crane/derrick involved must approve, in writing, the selection and configuration of components; or (B) Approved modifications that meet the requirements of

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Sec. 1926.1434 (Equipment modifications). (ii) Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (b)(2)(i) of this section (see Sec. 1926.1412(c) for post-assembly inspection requirements). (3) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.	engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (B) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications). (ii) *Post-assembly inspection*. Upon completion of assembly, the equipment is inspected to ensure that it is in compliance with paragraph (b)(2)(i) of this section (see § 1926.1412(c) for post-assembly inspection requirements). (3) *Manufacturer prohibitions*. The employer must comply with applicable manufacturer prohibitions.	WAC 296-155-53400(60) and (61). (ii) *Post-assembly inspection*. Upon completion of assembly, the equipment is inspected to ensure that it is in compliance with paragraph (2)(b)(i) of this section. (iii) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.
(c) Operation--procedures. (1) The employer shall comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments. (2) Unavailable operation procedures. (i) Where the manufacturer procedures are unavailable, the employer shall develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (ii) Procedures for the operational controls must be developed by a qualified person. (iii) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment. (3) Accessibility. (i) The load chart shall be available to the operator at the control station. (ii) Procedures applicable to the operation of the equipment, recommended operating speeds, special hazard warnings, instructions and operator's manual, shall be readily available for use by the operator.	(c) *Operation – procedures*. (1) The employer must comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments. (2) *Unavailable operation procedures*. The employer must: (i) When the manufacturer's procedures are unavailable, develop, and ensure compliance with, all procedures necessary for the safe operation of the equipment and attachments. (ii) Ensure that procedures for the operational controls are developed by a qualified person. (iii) Ensure that procedures related to the capacity of the equipment are developed and signed by a registered professional engineer familiar with the equipment. (3) *Accessibility*. The employer must ensure that: (i) The load chart is available to the operator at the control station; (ii) Procedures applicable to the operation of the equipment, recommended operating speeds, special hazard warnings, instructions, and operator's manual are readily available for use by the operator.	(3) Operation--procedures. (a) The employer must comply with all manufacturer procedures applicable to the operational functions of the crane/derrick, including its use with attachments. (b) Unavailable operation procedures. The employer must: (i) Where the manufacturer procedures are unavailable, the employer must develop and ensure compliance with all procedures necessary for the safe operation of the crane/derrick and attachments. (ii) Ensure that procedures for the operational controls are developed by a qualified person. (iii) Ensure that procedures related to the capacity of the crane/derrick are developed and signed by a registered professional engineer. (c) Accessibility. The employer must ensure that: (i) The load chart must be available to the operator at the control station. (ii) Procedures applicable to the operation of the crane/derrick, recommended operating speeds, special hazard warnings, instructions and operator's manual, are readily available for use by the operator.

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(iii) Where rated capacities are available at the control station only in electronic form: In the event of a failure which makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.	(iii) When rated capacities are available at the control station only in electronic form and a failure occurs that makes the rated capacities inaccessible, the operator immediately ceases operations or follows safe shut-down procedures until the rated capacities (in electronic or other form) are available.	(iii) Where rated capacities are available at the control station only in electronic form and a failure occurs that makes the rated capacities inaccessible, the operator must immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.
(d) Safety devices and operational aids. (1) Originally-equipped safety devices and operational aids shall be maintained in accordance with manufacturer procedures. (2) Anti two-blocking. Equipment covered by this section manufactured more than one year after the effective date of this standard shall have either an anti two-block device that meets the requirements of Sec. 1926.1416(d)(3), or shall be designed so that, in the event of a two-block situation, no damage will occur and there will be no load failure (such as where the power unit will stall in the event of a two-block).	(d) *Safety devices and operational aids*. (1) The employer must ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer procedures. (2) *Anti two-blocking*. The employer must ensure that equipment covered by this section manufactured more than one year after [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] have either an anti two-block device that meets the requirements of § 1926.1416(d)(3), or is designed so that, in the event of a two-block situation, no damage or load failure will occur (for example, by using a power unit that stalls in response to a two-block situation).	(4) Safety devices and operational aids. (a) The employer must ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer procedures. (b) Anti two-blocking. The employer must ensure that cranes covered by this section manufactured after the effective date of this standard must have either an anti two-block device that meets the requirements of WAC 296-155-53412(4)(c), or is designed so that, in the event of a two-block situation, no damage or load failure will occur (for example, by using a power unit that stalls in response to a two-block situation).
(e) Operator qualifications. The employer shall ensure that, prior to operating the equipment, the operator is trained on the safe operation of the type of equipment the operator will be using.	(e) *Operator qualifications*. The employer must train each operator, prior to operating the equipment, on the safe operation of the type of equipment the operator will be using.	(5) Operator qualifications. The employer must train each operator, prior to operating the crane/derrick, the operator is trained on the safe operation of the type of crane/derrick the operator will be using.
(f) Signal person qualifications. The employer shall ensure that signal persons are trained in the proper use of signals applicable to the use of the equipment.	(f) *Signal person qualifications*. The employer must train each signal person in the proper use of signals applicable to the use of the equipment.	(6) Signal person qualifications. The employer must train each signal person, in the proper use of signals applicable to the use of the crane/derrick.
~~(g) Keeping clear of the load. Section 1926.1425 applies, except for Sec. 1926.1425(c)(3) (qualified rigger).~~	(g) [*Reserved*.]	
(h) Inspections. The equipment shall be inspected in accordance with manufacturer procedures.	(h) *Inspections*. The employer must ensure that equipment is inspected in accordance with manufacturer procedures.	(7) Inspections. The employer must ensure that the crane/derrick is inspected in accordance with manufacturer procedures.
(i) [Reserved.]	(i) [*Reserved*.]	

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(j) Hoisting personnel. Hoisting personnel using equipment covered by this section is prohibited.	(j) *Hoisting personnel*. The employer must ensure that equipment covered by this section is not used to hoist personnel.	(8) Hoisting personnel. The employer must ensure that equipment covered by this section is not used to hoist personnel.
(k) Design. The equipment shall be designed by a qualified engineer.	(k) *Design*. The employer must ensure that the equipment is designed by a qualified engineer.	(9) Design. The employer must ensure that the crane/derrick is designed by a qualified engineer.
	§ 1926.1442 Severability. (a) Should a court of competent jurisdiction hold any provision(s) of subpart CC to be invalid, such action shall not affect any other provision of the subpart.	
Appendix A to Subpart CC of Part 1926--Standard Hand Signals	**Appendix A to Subpart CC of Part 1926–Standard Hand Signals.**	**WAC 296-155-56400 Mobile Crane Hand Signal Chart**
STOP--With arm extended horizontally to the side, palm down, arm is swung back and forth.	**STOP –** With arm extended horizontally to the side, palm down, arm is swung back and forth.	**Stop** **Arm extended, palm down, move back and forth horizontally.**
HOIST--With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.	**HOIST –** With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.	**Hoist** **With forearm vertical, forefinger pointing up, move hand in small horizontal circles.**
RAISE BOOM--With arm extended horizontally to the side, thumb points up with other fingers closed.	**RAISE BOOM –** With arm extended horizontally to the side, thumb points up with other fingers closed.	**Raise Boom** **Arm extended, fingers closed, thumb pointing upward.**
SWING--With arm extended horizontally, index finger points in direction that boom is to swing.	**SWING –** With arm extended horizontally, index finger points in direction that boom is to swing.	**Swing** **Arm extended, point with finger in direction of swing of boom.**
RETRACT TELESCOPING BOOM--With hands to the front at waist level, thumbs point at each other with other fingers closed.	**RETRACT TELESCOPING BOOM –** With hands to the front at waist level, thumbs point at each other with other fingers closed.	**Retract Boom** **Both fists in front of body with thumbs pointing towards each other.**
RAISE THE BOOM AND LOWER THE LOAD--With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	**RAISE THE BOOM AND LOWER THE LOAD –** With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	**Raise the Boom & Lower the Load** **With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.**
DOG EVERYTHING--Hands held together at waist level.	**DOG EVERYTHING –** Hands held together at waist level.	**Dog Everything** **Clasp hands in front of body.**
LOWER--With arm and index finger pointing down, hand	**LOWER –** With arm and index finger pointing down, hand	**Lower**

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and finger make small circles.	and finger make small circles.	**With arm extended downward, forefinger pointing down, move hand in small horizontal circles.**
LOWER BOOM--With arm extended horizontally to the side, thumb points down with other fingers closed.	**LOWER BOOM –** With arm extended horizontally to the side, thumb points down with other fingers closed.	**Lower Boom** **Arm extended fingers closed, thumb pointing downward.**
EXTEND TELESCOPING BOOM--With hands to the front at waist level, thumbs point outward with other fingers closed.	**EXTEND TELESCOPING BOOM –** With hands to the front at waist level, thumbs point outward with other fingers closed.	**Extend Boom** **Both fists in front of body with thumbs pointing outward.**
TRAVEL--With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.	**TRAVEL/TOWER TRAVEL** – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.	**Travel** **Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.**
LOWER THE BOOM AND RAISE THE LOAD--With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	**LOWER THE BOOM AND RAISE THE LOAD –** With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	**Lower the Boom & Raise the Load** **With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.**
MOVE SLOWLY--A hand is placed in front of the hand that is giving the action signal	**MOVE SLOWLY –** A hand is placed in front of the hand that is giving the action signal.	**Move Slowly** **Use one hand to give motion signal and place other hand motionless in front of hand giving the motion signal. (Hoist slowly shown as example.)**
USE AUXILIARY HOIST (whipline)--With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.	**USE AUXILIARY HOIST** (whipline) **–** With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.	**Use Whip Line (Auxiliary Hoist)** **Tap elbow with one hand; then use regular signals.**
CRAWLER CRANE TRAVEL, BOTH TRACKS--Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.	**CRAWLER CRANE TRAVEL, BOTH TRACKS –** Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.	**Travel (Both Tracks)** **Use both fists in front of body, making a circular motion about each other, indicating direction of travel, forward or backward.**
USE MAIN HOIST--A fist taps on top of the head. Then regular signal is given to indicate desired action.	**USE MAIN HOIST –** A hand taps on top of the head. Then regular signal is given to indicate desired action.	**Use Main Hoist** **Tap fist on head; then use regular signals**
CRAWLER CRANE TRAVEL, ONE TRACK--Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.	**CRAWLER CRANE TRAVEL, ONE TRACK –** Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.	**Travel (One Track)** **Lock the track on side indicated by raised fist. Travel opposite track in direction of other fist, rotated**

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		vertically in front of body.
	TROLLEY TRAVEL – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.	
	EMERGENCY STOP – With both arms extended horizontally to the side, palms down, arms are swung back and forth.	**Emergency Stop** **Both arms extended, palms down, move arms back and forth horizontally.**
		Extend Boom (One Hand Signal) **One fist in front of chest with thumb tapping chest.**
		Retract Boom (One Hand Signal) **One fist in front of chest, thumb pointing outward and with heal of fist tapping chest.**
~~**Appendix B to Subpart CC of Part 1926--Use of Non-Standard Signals**~~		
~~The follow is an example of a situation where the use of the Standard Method for hand signals is infeasible: Due to background lighting conditions behind the signal person, there is insufficient contrast between the person's hand and the sky color. This prevents the operator from being able to clearly see the signal person's hand and fingers when extended out to either side.~~		
~~**Appendix C to Subpart CC of Part 1926--Checklist for Determining if**~~		
~~**Hoisting Personnel is Permissible**~~		
~~A. HOISTING PERSONNEL IS PERMITTED: When the employer can show that the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. See Sec. 1926.1431(a). However, the employer may hoist personnel without showing that the~~		

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~~erection, use, and dismantling of conventional means of reaching the worksite would be more hazardous, or is not possible because of the project's structural design or worksite conditions:~~ ~~(1) When engaged in work covered by subpart R (Steel Erection) of this part. See Sec. 1926.1431(a);~~ ~~(2) When using a personnel platform to hoist personnel for pile driving operations. See Sec. 1926.1431(p)(3).~~		
~~B. HOISTING PERSONNEL IS ALWAYS PROHIBITED: Even if hoisting personnel is otherwise permitted, it is prohibited:~~ ~~(1) When any part of the equipment would get closer than 20 feet to a power line that is 350 kV or less or 50 feet to a power line over 350 kV, unless the employer is engaged in Subpart V work. See Sec. 1926.1431(n);~~ ~~(2) When equipment is traveling unless the equipment travels on fixed rails or the employer can demonstrate that there is no less hazardous way to perform the work. See Sec. 1926.1431(k)(12). However, when the equipment is a derrick, it may not be used to hoist personnel while traveling under any circumstances. See Sec. 1926.1431(k)(13);~~ ~~(3) When the equipment has a rated hoisting/lifting capacity of 2,000 pounds or less. See Sec. 1926.1441(j).~~		
~~C. WHEN HOISTING PERSONNEL IS PERMITTED, A PERSONNEL PLATFORM MEETING THE REQUIREMENTS OF Sec. 1431 MUST BE USED, EXCEPT:~~ ~~(1) When hoisting personnel in drill shafts 8 feet or less in diameter, the employer may instead use either a personnel platform or a boatswain's chair. See Sec. 1926.1431(o);~~ ~~(2) When hoisting personnel for pile driving operations the employer may instead use a boatswain's chair. See Sec.~~		

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~~1926.1431(p);~~ ~~(3) When hoisting personnel for marine transfer, the employer may instead use a marine hoisted personnel transfer device. See Sec. 1926.1431(r);~~ ~~(4) When hoisting personnel for storage tank, shaft, and chimney operations, the employer may instead use a boatswain's chair, but only if use of a personnel platform is infeasible. See Sec. 1926.1431(s).~~		
Appendix D to Subpart CC of Part 1926--Assembly/Disassembly: Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement	**Appendix B to Subpart CC of Part 1926–Assembly/Disassembly: Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement.**	**WAC 296-155-56430 – Assembly/Disassembly – Working under the boom, jib or other components: Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement.**
1. a. Section 1926.1404(f)(1) provides that when pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of Sec. 1926.1404(f)(2) are met. The exception in Sec. 1926.1404(f)(2) applies when the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed. In such a situation, the A/D supervisor must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom.	1. Section 1926.1404(f)(1) provides that when pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of § 1926.1404(f)(2) are met. The exception in § 1926.1404(f)(2) applies when the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed. In such a situation, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom.	1. WAC 296-155-53402(7)(a) provides that when pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of subsection (7)(b) are met. The exception in subsection (7)(b) applies when the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed. In such a situation, the assembly/disassembly supervisor must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom.
b. The following scenario is an example of how the exception applies: A boom cannot be disassembled on the ground because of aboveground piping (as might be found, for example, in an oil refinery) that precludes lowering the boom to the ground. The boom must therefore be disassembled in the air, and the employees who remove the pins must perform that work from an aerial lift whose base is positioned on one side (the near side) of the boom. To	The following scenario is an example of how the exception applies: A boom cannot be disassembled on the ground because of aboveground piping (as might be found, for example, in an oil refinery) that precludes lowering the boom to the ground. The boom must therefore be disassembled in the air, and the employees who remove the pins must perform that work from an aerial lift whose base is positioned on one side (the near side) of the boom. To	The following scenario is an example of how the exception applies: A boom cannot be disassembled on the ground because of an aboveground structure (as might be found, for example, at some construction sites) that precludes lowering the boom to the ground. The boom must therefore be disassembled in the air, and the employees who remove the pins must perform that work from an aerial lift whose base is positioned on one side (the near side) of the boom. To

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gain access to the pins on the far side, the aerial lift basket must move under the boom, since, due to lack of room, the aerial lift cannot be repositioned on the far side.	gain access to the pins on the far side, the aerial lift basket must move under the boom, since, due to lack of room, the aerial lift cannot be repositioned on the far side. Due to lack of room, the aerial lift cannot be repositioned on the far side, so the aerial basket must move under the boom to gain access to the pins on the far side.	gain access to the pins on the far side, the aerial lift basket must move under the boom, since, due to lack of room, the aerial lift cannot be repositioned on the far side. Due to lack of room, the aerial lift cannot be repositioned on the far side, so the aerial basket must move under the boom to gain access to the pins on the far side.
c. To minimize the risk of unintended dangerous movement while the pins are removed, the A/D supervisor uses an assist crane that is rigged to support the boom section that is being detached, using particular care to ensure that the section end that is near the employee(s) removing the pins is well supported. The duration and extent of exposure is minimized by removing the far side pins first, moving the aerial lift basket as soon as possible to the near side so that the employees are no longer under the boom, and then removing the near side pins.	To minimize the risk of unintended dangerous movement while the pins are removed, the A/D director uses an assist crane that is rigged to support the boom section that is being detached, using particular care to ensure that the section end that is near the employee(s) removing the pins is well supported. The duration and extent of exposure is minimized by removing the far side pins first, moving the aerial lift basket as soon as possible to the near side so that the employees are no longer under the boom, and then removing the near side pins.	To minimize the risk of unintended dangerous movement while the pins are removed, the Assembly/disassembly director uses an assist crane that is rigged to support the boom section that is being detached, using particular care to ensure that the section end that is near the employee(s) removing the pins is well supported. The duration and extent of exposure is minimized by removing the far side pins first, moving the aerial lift basket as soon as possible to the near side so that the employees are no longer under the boom, and then removing the near side pins.
2. a. Section 1926.1404(h)(6)(i) provides that, during assembly/disassembly, the center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. Section 1926.1404(h)(6)(ii) states that, where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used.	2. Section 1926.1404(h)(6)(i) provides that, during assembly/disassembly, the center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. Section 1926.1404(h)(6)(ii) states that, where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used.	2. WAC 296-155-53402(9)(f)(i) provides that, during assembly/disassembly, the center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. WAC 296-155-53402(9)(f)(ii) states that, where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used.
b. An example of the application of Sec. 1926.1404(h)(6)(ii) is as follows. The boom is assembled by lowering boom sections sequentially into place using an assist crane. The A/D supervisor's plan is to keep the boom sections stable while they are lowered into place by attaching the assist crane hoist line above the center of gravity of each section.	An example of the application of § 1926.1404(h)(6)(ii) is as follows: The boom is assembled by lowering boom sections sequentially into place using an assist crane. The A/D director's plan is to keep the boom sections stable while they are lowered into place by attaching the assist crane hoist line above the center of gravity of each section.	An example of the application of WAC 296-155-53402(9)(f)(ii) is as follows. The boom is assembled by lowering boom sections sequentially into place using an assist crane. The assembly/disassembly director's plan is to keep the boom sections stable while they are lowered into place by attaching the assist crane hoist line above the

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
However, in assembling the non-symmetrical top section of the boom, the A/D supervisor is not able to determine where to attach the assist crane hoist line so that it is above the center of gravity. In this situation, before raising the section, all personnel are kept clear of the section and the section is first raised a few inches to determine whether it tips when raised (if it did tip, it would indicate it is not rigged over the center of gravity). If this occurs, the hoist line is repositioned and the procedure repeated (with employees kept clear of the section while it is raised) until the A/D supervisor determines that it is rigged over the center of gravity and can be moved into place without dangerous movement.	However, in assembling the non-symmetrical top section of the boom, the A/D director is not able to determine where to attach the assist crane hoist line so that it is above the center of gravity. In this situation, before raising the section, all personnel are kept clear of the section and the section is first raised a few inches to determine whether it tips when raised (if it did tip, it would indicate it is not rigged over the center of gravity). If this occurs, the hoist line is repositioned and the procedure repeated (with employees kept clear of the section while it is raised) until the A/D director determines that it is rigged over the center of gravity and can be moved into place without dangerous movement.	center of gravity of each section. However, in assembling the non-symmetrical top section of the boom, the assembly/disassembly director is not able to determine where to attach the assist crane hoist line so that it is above the center of gravity. In this situation, before raising the section, all personnel are kept clear of the section and the section is first raised a few inches to determine whether it tips when raised (if it did tip, it would indicate it is not rigged over the center of gravity). If this occurs, the hoist line is repositioned and the procedure repeated (with employees kept clear of the section while it is raised) until the assembly/disassembly director determines that it is rigged over the center of gravity and can be moved into place without dangerous movement.
Appendix E to Subpart CC of Part 1926--Operator Certification: Written Examination: Technical Knowledge Criteria	**Appendix C to Subpart CC of Part 1926–Operator Certification: Written Examination: Technical Knowledge Criteria.**	**WAC 296-155-56420 Operator Certification: Written Examination: Technical Knowledge Criteria**
This appendix contains information for employers, accredited testing organizations, auditors and government entities developing criteria for a written examination to test an individual's technical knowledge relating to the operation of cranes.	This appendix contains information for employers, accredited testing organizations, auditors and government entities developing criteria for a written examination to test an individual's technical knowledge relating to the operation of cranes.	This appendix contains information for employers, accredited testing organizations, auditors and government entities developing criteria for a written examination to test an individual's technical knowledge relating to the operation of cranes.
(a) General technical information. (1) The functions and limitations of the crane and attachments. (2) Wire rope: (i) Background information necessary to understand the inspection and removal from service criteria in Sec. 1926.1413 and Sec. 1926.1414. (ii) Capacity and when multi-part rope is needed. (iii) Relationship between line pull and safe working load. (iv) How to determine the manufacturer's recommended	(a) General technical information. (1) The functions and limitations of the crane and attachments. (2) Wire rope: (i) Background information necessary to understand the inspection and removal from service criteria in § 1926.1413 and § 1926.1414. (ii) Capacity and when multi-part rope is needed. (iii) Relationship between line pull and safe working load. (iv) How to determine the manufacturer's recommended	(1) General technical information. (a) The functions and limitations of the crane and attachments. (b) Wire rope: (i) Background information necessary to understand the inspection and removal from service criteria in WAC 296-155-53404. (ii) Capacity and when multi-part rope is needed. (iii) Relationship between line pull and safe working load. (iv) How to determine the manufacturer's recommended

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
rope for the crane. (3) Rigging devices and their use, such as: (i) Slings. (ii) Spreaders. (iii) Lifting beams. (iv) Wire rope fittings, such as clips, shackles and wedge sockets. (v) Saddles (softeners). (vi) Clamps (beams). (4) The technical limitations of protective measures against electrical hazards: (i) Grounding. (ii) Proximity warning devices. (iii) Insulated links. (iv) Boom cages. (v) Proximity to electric power lines, radii, and microwave structures. (5) The effects of load share and load transfer in multi-crane lifts. (6) Basic crane terms. (7) The basics of machine power flow systems. (i) Mechanical. (ii) Electrical. (iii) Pneumatic. (iv) Hydraulic. (v) Combination. (8) The significance of the instruments and gauge readings. (9) The effects of thermal expansion and contraction in hydraulic cylinders. (10) Background information necessary to understand the requirements of pre-operation and inspection. (11) How to use the safety devices and operational aids	rope for the crane. (3) Rigging devices and their use, such as: (i) Slings. (ii) Spreaders. (iii) Lifting beams. (iv) Wire rope fittings, such as clips, shackles and wedge sockets. (v) Saddles (softeners). (vi) Clamps (beams). (4) The technical limitations of protective measures against electrical hazards: (i) Grounding. (ii) Proximity warning devices. (iii) Insulated links. (iv) Boom cages. (v) Proximity to electric power lines, radii, and microwave structures. (5) The effects of load share and load transfer in multi-crane lifts. (6) Basic crane terms. (7) The basics of machine power flow systems. (i) Mechanical. (ii) Electrical. (iii) Pneumatic. (iv) Hydraulic. (v) Combination. (8) The significance of the instruments and gauge readings. (9) The effects of thermal expansion and contraction in hydraulic cylinders. (10) Background information necessary to understand the requirements of pre-operation and inspection. (11) How to use the safety devices and operational aids	rope for the crane. (c) Rigging devices and their use, such as: (i) Slings. (ii) Spreaders. (iii) Lifting beams. (iv) Wire rope fittings, such as clips, shackles and wedge sockets. (v) Saddles (softeners). (vi) Clamps (beams). (d) The technical limitations of protective measures against electrical hazards: (i) Grounding. (ii) Proximity warning devices. (iii) Insulated links. (iv) Boom cages. (v) Proximity to electric power lines, radii, and microwave structures. (e) The effects of load share and load transfer in multi-crane lifts. (f) Basic crane terms. (g) The basics of machine power flow systems. (i) Mechanical. (ii) Electrical. (iii) Pneumatic. (iv) Hydraulic. (v) Combination. (h) The significance of the instruments and gauge readings. (i) The effects of thermal expansion and contraction in hydraulic cylinders. (j) Background information necessary to understand the requirements of pre-operation and inspection. (k) How to use the safety devices and operational aids

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
required under Sec. 1926.1415 and Sec. 1926.1416. (12) The difference between duty-cycle and lifting operations. (13) How to calculate net capacity for every possible configuration of the equipment using the manufacturer's load chart. (14) How to use manufacturer-approved attachments and their effect on the equipment. (15) How to obtain dimensions, weight, and center of gravity of the load. (16) The effects of dynamic loading from: (i) Wind. (ii) Stopping and starting. (iii) Impact loading. (iv) Moving with the load. (17) The effect of side loading. (18) The principles of backward stability.	required under § 1926.1415 and § 1926.1416. (12) The difference between duty-cycle and lifting operations. (13) How to calculate net capacity for every possible configuration of the equipment using the manufacturer's load chart. (14) How to use manufacturer-approved attachments and their effect on the equipment. (15) How to obtain dimensions, weight, and center of gravity of the load. (16) The effects of dynamic loading from: (i) Wind. (ii) Stopping and starting. (iii) Impact loading. (iv) Moving with the load. (17) The effect of side loading. (18) The principles of backward stability.	required under WAC 296-155-53410 and 296-155-53412. (l) The difference between duty-cycle and lifting operations. (m) How to calculate net capacity for every possible configuration of the equipment using the manufacturer's load chart. (n) How to use manufacturer-approved attachments and their effect on the equipment. (o) How to obtain dimensions, weight, and center of gravity of the load. (p) The effects of dynamic loading from: (i) Wind. (ii) Stopping and starting. (iii) Impact loading. (iv) Moving with the load. (q) The effect of side loading. (r) The principles of backward stability.
(b) Site information. (1) How to identify the suitability of the supporting ground/surface to support the expected loads of the operation. Elements include: (i) Weaknesses below the surface (such as voids, tanks, loose fill). (ii) Weaknesses on the surface (such as retaining walls, slopes, excavations, depressions). (2) Proper use of mats, blocking/cribbing and outriggers or crawlers. (3) Identification of site hazards such as power lines, piping, and traffic. (4) How to review operation plans with supervisors and other workers (such as the signal person), including how to determine working height, boom length, load radius, and	(b) Site information. (1) How to identify the suitability of the supporting ground/surface to support the expected loads of the operation. Elements include: (i) Weaknesses below the surface (such as voids, tanks, loose fill). (ii) Weaknesses on the surface (such as retaining walls, slopes, excavations, depressions). (2) Proper use of mats, blocking/cribbing, outriggers, stabilizers, or crawlers. (3) Identification of site hazards such as power lines, piping, and traffic. (4) How to review operation plans with supervisors and other workers (such as the signal person), including how to determine working height, boom length, load radius, and	(2) Site information. (a) How to identify the suitability of the supporting ground/surface to support the expected loads of the operation. Elements include: (i) Weaknesses below the surface (such as voids, tanks, loose fill). (ii) Weaknesses on the surface (such as retaining walls, slopes, excavations, depressions). (b) Proper use of mats, blocking/cribbing, outriggers, stabilizers, or crawlers. (c) Identification of site hazards such as power lines, piping, and traffic. (d) How to review operation plans with supervisors and other workers (such as the signal person), including how to determine working height, boom length, load radius, and

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
travel clearance. (5) How to determine if there is adequate room for extension of crawlers or outriggers/stabilizers and counterweights.	travel clearance. (5) How to determine if there is adequate room for extension of crawlers or outriggers/stabilizers and counterweights.	travel clearance. (e) How to determine if there is adequate room for extension of crawlers or outriggers/stabilizers and counterweights.
(c) Operations. (1) How to pick, carry, swing and place the load smoothly and safely on rubber tires and on outriggers/stabilizers or crawlers (where applicable). (2) How to communicate at the site with supervisors, the crew and the signal person. (3) Proper procedures and methods of reeving wire ropes and methods of reeving multiple-part lines and selecting the proper load block and/or ball. (4) How to react to changes in conditions that affect the safe operation of the equipment. (5) How to shut down and secure the equipment properly when leaving it unattended. (6) Know how to apply the manufacturer's specifications for operating in various weather conditions, and understand how environmental conditions affect the safe operation of the equipment. (7) How to properly level the equipment. (8) How to verify the weight of the load and rigging prior to initiating the lift. (9) How to determine where the load is to be picked up and placed and how to verify the radii. (10) Know basic rigging procedures. (11) How to carry out the shift inspection required in this subpart. (12) Know that the following operations require specific procedures and skill levels: (i) Multi-crane lifts.	(c) Operations. (1) How to pick, carry, swing and place the load smoothly and safely on rubber tires and on outriggers/stabilizers or crawlers (where applicable). (2) How to communicate at the site with supervisors, the crew and the signal person. (3) Proper procedures and methods of reeving wire ropes and methods of reeving multiple-part lines and selecting the proper load block and/or ball. (4) How to react to changes in conditions that affect the safe operation of the equipment. (5) How to shut down and secure the equipment properly when leaving it unattended. (6) Know how to apply the manufacturer's specifications for operating in various weather conditions, and understand how environmental conditions affect the safe operation of the equipment. (7) How to properly level the equipment. (8) How to verify the weight of the load and rigging prior to initiating the lift. (9) How to determine where the load is to be picked up and placed and how to verify the radii. (10) Know basic rigging procedures. (11) How to carry out the shift inspection required in this subpart. (12) Know that the following operations require specific procedures and skill levels: (i) Multi-crane lifts.	(3) Operations. (a) How to pick, carry, swing and place the load smoothly and safely on rubber tires and on outriggers/stabilizers or crawlers (where applicable). (b) How to communicate at the site with supervisors, the crew and the signal person. (c) Proper procedures and methods of reeving wire ropes and methods of reeving multiple-part lines and selecting the proper load block and/or ball. (d) How to react to changes in conditions that affect the safe operation of the equipment. (e) How to shut down and secure the equipment properly when leaving it unattended. (f) Know how to apply the manufacturer's specifications for operating in various weather conditions, and understand how environmental conditions affect the safe operation of the equipment. (g) How to properly level the equipment. (h) How to verify the weight of the load and rigging prior to initiating the lift. (i) How to determine where the load is to be picked up and placed and how to verify the radii. (j) Know basic rigging procedures. (k) How to carry out the shift inspection required in this subpart. (l) Know that the following operations require specific procedures and skill levels: (i) Multi-crane lifts.

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
(ii) Hoisting personnel. (iii) Clamshell/dragline operations. (iv) Pile driving and extracting. (v) Concrete operations, including poured-in-place and tilt-up. (vi) Demolition operations. (vii) Operations on water. (viii) Magnet operations. (ix) Multi-drum operations. (13) Know the proper procedures for operating safely under the following conditions: (i) Traveling with suspended loads. (ii) Approaching a two-block condition. (iii) Operating near power lines. (iv) Hoisting personnel. (v) Using other than full outrigger/crawler extensions. (vi) Lifting loads from beneath the surface of the water. (vii) Using various approved counterweight configurations. (viii) Handling loads out of the operator's vision ("operating in the blind"). (ix) Using electronic communication systems for signal communication. (14) Know the proper procedures for load control and the use of hand-held tag lines. (15) Know the emergency response procedure for: (i) Fires. (ii) Power line contact. (iii) Loss of stability. (iv) Control malfunction. (v) Two-blocking. (vi) Overload. (vii) Carrier or travel malfunction.	(ii) Hoisting personnel. (iii) Clamshell/dragline operations. (iv) Pile driving and extracting. (v) Concrete operations, including poured-in-place and tilt-up. (vi) Demolition operations. (vii) Operations on water. (viii) Magnet operations. (ix) Multi-drum operations. (13) Know the proper procedures for operating safely under the following conditions: (i) Traveling with suspended loads. (ii) Approaching a two-block condition. (iii) Operating near power lines. (iv) Hoisting personnel. (v) Using other than full outrigger/crawler or stabilizer extensions. (vi) Lifting loads from beneath the surface of the water. (vii) Using various approved counterweight configurations. (viii) Handling loads out of the operator's vision ("operating in the blind"). (ix) Using electronic communication systems for signal communication. (14) Know the proper procedures for load control and the use of hand-held tag lines. (15) Know the emergency response procedure for: (i) Fires. (ii) Power line contact. (iii) Loss of stability. (iv) Control malfunction. (v) Two-blocking. (vi) Overload.	(ii) Hoisting personnel. (iii) Clamshell/dragline operations. (iv) Pile driving and extracting. (v) Concrete operations, including poured-in-place and tilt-up. (vi) Demolition operations. (vii) Operations on water. (viii) Magnet operations. (ix) Multi-drum operations. (m) Know the proper procedures for operating safely under the following conditions: (i) Traveling with suspended loads. (ii) Approaching a two-block condition. (iii) Operating near power lines. (iv) Hoisting personnel. (v) Using other than full outrigger/crawler or stabilizer extensions. (vi) Lifting loads from beneath the surface of the water. (vii) Using various approved counterweight configurations. (viii) Handling loads out of the operator's vision ("operating in the blind"). (ix) Using electronic communication systems for signal communication. (n) Know the proper procedures for load control and the use of hand-held tag lines. (o) Know the emergency response procedure for: (i) Fires. (ii) Power line contact. (iii) Loss of stability. (iv) Control malfunction. (v) Two-blocking. (vi) Overload.

OSHA'S PROPOSED RULE	OSHA'S ADOPTED RULE	DOSH'S PROPOSED RULE
(16) Know how to properly use outriggers in accordance with manufacturer specifications.	(vii) Carrier or travel malfunction. (16) Know how to properly use outriggers and stabilizers in accordance with manufacturer specifications.	(vii) Carrier or travel malfunction. (p) Know how to properly use outriggers and stabilizers in accordance with manufacturer specifications.
(d) Use of load charts. (1) Know the terminology necessary to use load charts. (2) Know how to ensure that the load chart is the appropriate chart for the equipment in its particular configuration and application. (3) Know how to use load charts. This includes knowing: (i) The operational limitations of load charts and footnotes. (ii) How to relate the chart to the configuration of the crane, crawlers, or outriggers extended or retracted, jib erected or offset, and various counterweight configurations. (iii) The difference between structural capacity and capacity limited by stability. (iv) What is included in capacity ratings. (v) The range diagram and its relationship to the load chart. (vi) The work area chart and its relationship to the load chart. (vii) Where to find and how to use the "parts-of-line" information. (4) Know how to use the load chart together with the load indicators and/or load moment devices.	(d) Use of load charts. (1) Know the terminology necessary to use load charts. (2) Know how to ensure that the load chart is the appropriate chart for the equipment in its particular configuration and application. (3) Know how to use load charts. This includes knowing: (i) The operational limitations of load charts and footnotes. (ii) How to relate the chart to the configuration of the crane, crawlers, or outriggers/stabilizers extended or retracted, jib erected or offset, and various counterweight configurations. (iii) The difference between structural capacity and capacity limited by stability. (iv) What is included in capacity ratings. (v) The range diagram and its relationship to the load chart. (vi) The work area chart and its relationship to the load chart. (vii) Where to find and how to use the "parts-of-line" information. (4) Know how to use the load chart together with the load indicators and/or load moment devices.	(4) Use of load charts. (a) Know the terminology necessary to use load charts. (b) Know how to ensure that the load chart is the appropriate chart for the equipment in its particular configuration and application. (c) Know how to use load charts. This includes knowing: (i) The operational limitations of load charts and footnotes. (ii) How to relate the chart to the configuration of the crane, crawlers, or outriggers/stabilizers extended or retracted, jib erected or offset, and various counterweight configurations. (iii) The difference between structural capacity and capacity limited by stability. (iv) What is included in capacity ratings. (v) The range diagram and its relationship to the load chart. (vi) The work area chart and its relationship to the load chart. (vii) Where to find and how to use the "parts-of-line" information. (d) Know how to use the load chart together with the load indicators and/or load moment devices.