CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
R 408.41001a Scope.	1926.1400 Scope
Rule 1001a. (1) 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 any of the following: (a) Articulating cranes, such as knuckle-boom cranes. (b) Crawler cranes. (c) Floating cranes. (d) Cranes on barges. (e) Locomotive cranes. (f) Mobile cranes, such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes. (g) Multi-purpose machines when configured to hoist and lower by means of a winch or hook and horizontally move a suspended load. (h) Industrial cranes, such as carrydeck cranes. (i) Dedicated pile drivers. (j) Service/mechanic trucks with a hoisting device. (k) Crane on a monorail. (l) Tower cranes, such as a fixed jib, i.e., ‘‘hammerhead boom’’, luffing boom and self-erecting. (m) Pedestal cranes. (n) Portal cranes. (o) Overhead and gantry cranes. (p) Straddle cranes. (q) Sideboom cranes. (r) Derricks. (s) Material and personnel hoists. (t) Helicopter cranes, elevators, and excavation equipment and variations of such equipment.	1926.1400(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 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 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.
(2) Attachments. This standard applies to equipment included in subrule (1) of this rule when used with attachments. These attachments, whether crane-attached or suspended include, but are not limited, to any of the following: (a) Hooks. (b) Magnets. (c) Grapples. (d) Clamshell buckets. (e) Orange peel buckets. (f) Concrete buckets. (g) Drag lines. (h) Personnel platforms. (i) Augers or drills. (j) Pile driving equipment.	1926.1400(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.
(3) Exclusions. This standard does not cover any of the following:	1926.1400(c) Exclusions. This subpart does not cover:

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(a) Machinery included in subrule (1) of this rule while it has been converted or adapted for a non-hoisting or lifting use. These conversions or adaptations include, but are not limited, to any of the following: (i) Wheel loaders and backhoes. (ii) Loader backhoes. (iii) Track loader. (iv) Concrete pumps. This machinery is also excluded when used with chains, slings, or other rigging to lift suspended loads.	1926.1400(c)(1) Machinery included in paragraph (a) of this section 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. 1926.1400(c)(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.
(b) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.	1926.1400(c)(3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.
(c) Digger derricks used in work subject to construction safety standard part 16 “Power Transmission and Distribution,” shall comply with general industry safety standard part 86 “Electric Power Generation, Transmission and Distribution.” Digger derricks used in construction work for telecommunication service (as defined at construction safety standard part 30 “Telecommunications,” 1910.268(s)(40)) shall comply with construction safety standard part 30 “Telecommunications”. These rules are referenced in R 408.41003a.	1926.1400(c)(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.
(d) Machinery originally designed as vehicle-mounted aerial devices for lifting personnel and self-propelled elevating work platforms.	1926.1400(c)(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms.
(e) Telescopic or hydraulic gantry systems.	1926.1400(c)(6) Telescopic/hydraulic gantry systems.
(f) Stacker cranes.	1926.1400(c)(7) Stacker cranes.
(g) Powered industrial trucks, i.e. forklifts, except when configured to hoist and lower by means of a winch or hook and horizontally move a suspended load.	1926.1400(c)(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.
(h) Mechanic’s truck with a hoisting device when used in activities related to equipment maintenance and repair.	1926.1400(c)(9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.
(i) Machinery that hoists by using a come-a-long or chainfall.	1926.1400(c)(10) Machinery that hoists by using a come-a-long or chainfall.
(j) Dedicated drilling rigs.	1926.1400(c)(11) Dedicated drilling rigs.
(k) Gin poles when used for the erection of communication towers.	1926.1400(c)(12) Gin poles when used for the erection of communication towers.
(l) Tree trimming and tree removal work.	1926.1400(c)(13) Tree trimming and tree removal work.
(m) Anchor handling or dredge-related operations with a vessel or barge using an affixed A-frame.	1926.1400(c)(14) Anchor handling or dredge-related operations with a vessel or barge using an affixed A-frame.
(n) Roustabouts.	1926.1400(c)(15) Roustabouts.
	1926.1400(c)(16) Helicopter cranes.
(o) Material delivery	1926.1400(c)(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.	1926.1400(c)(17)(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	1926.1400(c)(17)(ii) Articulating/knuckle-boom truck cranes that deliver

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
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 or cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning automatic overload prevention device. These 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.	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 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 shall not apply under the following circumstances:	1926.1400(c)(17)(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.	1926.1400(c)(17)(iii)(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. Prefabricated components include, but are not limited to precast concrete members or panels, roof trusses constructed of wood, cold formed metal, steel, or other materials, prefabricated building sections such as, but not limited to floor panels, wall panels, roof panels, roof structures, or similar items.	1926.1400(c)(17)(iii)(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, bundled or unbundled steel decking or a component of a systems-engineered metal building, as defined in construction safety standard part 26 “Steel Erection,” as referenced in R 408.41003a.	1926.1400(c)(17)(iii)(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 R 408.41001a(3)(q)(i) and (ii).	1926.1400(c)(17)(iii)(D) The activity is not specifically excluded under § 1400(c)(17)(i) and (ii).
(4) All rules of this part apply to the equipment covered by this standard unless specified otherwise.	1926.1400(d) All sections of this subpart CC apply to the equipment covered by this standard unless specified otherwise.
(5) The duties of controlling entities under this standard include, but are not limited to, the duties specified in R 408.41017a(2), R 408.41017a(4) and R 408.41022a(2).	1926.1400(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).
(6) 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 compliance with such provisions.	1926.1400(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 compliance with such provisions.
(7) For work involving power transmission and distribution, compliance with general industry safety standard part 86 “Electric Power Generation, Transmission and Distribution” R 1910.269(p) is deemed compliance with R 408.41016a through R 408.41016e.	1926.1400(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.
(8) R 408.41017a 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 R 408.41017a(5).	1926.1400(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. § § 1926.1402(f).

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
R 408.41002a Rescinded.	
R 408.41003a Adopted and referenced standards.	
(1) The following standards are adopted by reference in these rules and are available from IHS Global, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 or via the internet at website: http://global.ihs.com; at a cost as of the time of adoption of these rules, as stated in this subrule.	
(a) American National Standards Institute (ANSI) standard A10.4 “Safety Requirements for Personnel Hoists and Employee Elevators for Construction and Demolition Operations,” 2004 edition. Cost: $128.00.	
(b) ANSI Standard B20.1, “Safety Standard for Conveyors, and Related Equipment,” 1999 edition. Cost: $52.00\	
(c) ANSI/ American Society of Mechanical Engineers (ASME) standard B30.5 “Mobile and Locomotive Cranes,” 1994 edition. Cost: $119.00.	
(d) ANSI/ASME standard B30.5 “Mobile and Locomotive Cranes,” 2004 edition. Cost: $60.00.	
(e) ANSI/American Society of Safety Engineers (ASSE) standard A10.5 “Safety Requirements for Material Hoists,” 1992 edition. Cost: $69.00.	
(f) ASME standard B30.14 “Side Boom Tractors,” 2004 edition. Cost: $64.00.	
(g) ASME standard B30.2 “Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist),” 2005 edition. Cost: $63.00.	
(h) ASME standard B30.7 “Base Mounted Drum Hoists,” 1994 edition. Cost: $60.00.	
(i) ASME standard B30.7 “Base Mounted Drum Hoists,” 2001 edition. Cost: $60.00.	
(j) American Welding Society (AWS) standard “IHS AWSC Structural Welding Code,” 2000 edition. Cost: $601.00.	
(k) AWS standard D1.1/D1.1M “Structural Welding Code – Steel Updates Every 5 Years,” 2002 edition. Cost: $468.00.	
(l) AWS standard D14.1 “Welding of Industrial and Mill Cranes and Other Material Handling Equipment,” 1997 edition. Cost: $148.00.	
(m) AWS standard D14.3 “Specification for Welding Earthmoving and Construction Equipment,” 1994 edition. Cost: $109.00.	
(n) AWS standard D14.4 “Class and Application of Welded Joints for Machinery Equipment,” 1997 edition. Cost: $139.00.	
(o) International Organization for Standardization (ISO) standard 11660–1 “Cranes – Access, Guards and Restraints – Part 1: General,” 2008 edition. Cost: $139.00.	
(p) ISO standard 11660–2 “Cranes – Access, Guards and Restraints – Part 2: Mobile Cranes,” 1994 edition. Cost: $107.00.	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(q) ISO standard 11660–3 “Cranes – Access, Guards and Restraints – Part 3: Tower Cranes,” 2008 edition. Cost: $65.00.	
(r) Society of Automotive Engineers (SAE) standard J185, “Access Systems for Off-Road Machines,” May 2003 edition. Cost: $73.00.	
(s) SAE standard J987 “Lattice Boom Cranes – Method of Test,” June 2003 edition. Cost: $73.00	
(t) SAE standard J1063 “Cantilevered Boom Crane Structures – Method of Test,” November 1993 edition. Cost: $73.00.	
(2) The following standards are adopted by reference in these rules and are available from Techstreet, 3916 Ranchero Drive, Ann Arbor, Michigan, 48108, USA, telephone number: 1-800-699-9277 or via the internet at website: www.techstreet.com; at a cost as of the time of adoption of these rules, as stated in this subrule.	
(a) ANSI standard B20.1, “Safety Standard for Conveyors, and Related Equipment,” 2000 edition. Cost: $67.00.	
(b) AWS standard B1.10 “Guide for the Nondestructive Inspection of Welds,” 1986 edition. Cost: $60.00.	
(c) British European Standards (BS EN) standard 13000, “Cranes – Mobile Cranes,” 2004 edition. Cost: $244.61.	
(d) BS EN standard 14439, “Cranes – Safety – Tower Cranes,” 2006 edition. Cost: $202.18.	
(3) Power Crane and Shovel Association (PCSA) Standard No. 4 “Mobile Power Crane and Excavator and Hydraulic Crane Standards,” 1983 edition, is adopted by reference in these rules. This standard is available from the Association of Equipment Manufacturers, 6737 West Washington Street, Suite 2400, Milwaukee, Wisconsin, 53214-5647, USA, telephone number: 1-414-272-0943 or via the internet at website: http://shop.aem.org; at a cost as of the time of adoption of these rules of $3.00.	
(4) The following federal occupational safety and health administration’s regulations promulgated by the United States department of labor are adopted by reference in this rule and are available from the United States Department of Labor, Occupational Safety and Health Administration, 315 West Allegan, room 315, Lansing, Michigan, 48917, or via the internet at website www.osha.gov, at no charge as of the time of adoption of these rules.	
(a) The provisions of 29 C.F.R. §1910.7 Definition and requirements for a nationally recognized testing laboratory.	
(b) The provisions of 29 C.F.R. §§1926.555 Conveyors, except as amended in this rule.	
(c) As of the effective date of this part, subpart G referenced in the provisions of 19 C.F.R. §1926.555 Conveyors means construction safety standard Part 22 “Signals, Signs, Tags, and Barricades,” as referenced in R 408.41003a.	
(d) The provisions of 29 C.F.R. §1926.556, as incorporated by reference under section 14(1) of Act No. 154 of the Public Acts of 1974, as amended,	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
being MCL 408.1014(1), are hereby rescinded as authorized by section 14(1).	
(e) Conveyors. The provisions of 29 C.F.R. §1926.555 are amended to read as follows.	
(i) Means for stopping the motor or engine shall be provided at the operator's station. Conveyor systems shall be equipped with an audible warning signal to be sounded immediately before starting up the conveyor.	
(ii) If the operator's station is at a remote point, the employer shall provide similar provisions for stopping the motor or engine at the motor or engine location.	
(iii) Emergency stop switches shall be arranged so that the conveyor cannot be started again until the actuating stop switch has been reset to running or the "on" position.	
(iv) Screw conveyors shall be guarded to prevent employee contact with turning flights.	
(v) Where a conveyor passes over work areas, aisles, or thoroughfares, the employer shall provide suitable guards to protect employees required to work below the conveyors.	
(vi) The employer shall ensure that all crossovers, aisles, and passageways are conspicuously marked by suitable signs, as required by subpart G of this part.	
(vii) The employer shall ensure that conveyors are locked out or otherwise rendered inoperable, and tagged out with a "DO NOT OPERATE" tag during repairs and when operation is hazardous to employees performing maintenance work.	
(viii) All conveyors in use shall meet the applicable requirements for design, construction, inspection, testing, maintenance, and operation, as prescribed in the ANSI Standard B20.1, "Safety Standard for Conveyors, and Related Equipment," 1999 edition.	
(5) The provisions of 49 C.F.R. §§391.41 through 391.49 of the United States department of transportation are adopted by reference in this rule and are available from the United States Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590, or via the internet at website www.access.gpo.gov/nara/cfr/waisidx_06/49cfr391_06.html, at no charge as of the time of adoption of these rules.	
(6) The provisions of Act No. 227 of the Public Acts of 1967 and Act No. 333 of the Public Acts of 1976, being MCL 408.801 through MCL 408.824 and 338.2151, respectively, are adopted by reference in this rule and are available via the internet at website www.legislature.mi.gov, at no charge as of the time of adoption of these rules.	
(7) The standards adopted in subrules (1) through (6) of this rule are also available for inspection at the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143.	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(8) Copies of the standards adopted in subrules (1) through (6) of this rule may be obtained from the publisher or may also be obtained from the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost charged in subrules (1) through (6), of this rule, plus $20.00 for shipping and handling.	
(9) The following Michigan occupational safety and health standards are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143 or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, as of the time of adoption of these rules, is 4 cents per page.	
(a) Construction safety standard part 6 “Personal Protective Equipment,” R 408.40601 to R 408.40641.	
(b) Construction safety standard part 8 “Handling and Storage of Materials,” R 408.40801 to R 408.40841.	
(c) Construction safety standard part 13 “Mobile Equipment,” R 408.41301.	
(d) Construction safety standard part 16 “Power Transmission and Distribution,” R 408.41601 to R 408.41658.	
(e) Construction safety standard part 18 “Fire Protection and Prevention,” R 408.41801 to R 408.41884.	
(f) Construction safety standard part 22 “Signals, Signs, Tags, and Barricades,” R 408.42201 to R 408.42243.	
(g) Construction safety standard part 26 “Steel Erection,” R 408.42601 to R 408.42656.	
(h) Construction safety standard part 28 “Personnel Hoisting in Steel Erection,” R 408.42801 to R 408.42809.	
(i) Construction safety standard part 30 “Telecommunications,” R 408.43001 to R 408.3006.	
(j) Construction safety standard part 45 “Fall Protection,” R 408.44501 to R 408.44502.	
(k) General industry safety standard part 18 “Overhead and Gantry Cranes,” R 408.11801 to R 408.11875.	
(l) General industry safety standard part 59 “Helicopters,” R 408.15901 to R 408.15931.	
(m) General industry safety standard part 86 “Electric Power Generation, Transmission, and Distribution,” R 408.18601 to R 408.18602.	
R 408.41004a Definitions; A to J.	1926.1401 Definitions
Rule 1004a. For purposes of this standard, the following definitions shall apply:	
(1) "A/D director” means the assembly/disassembly director who is an	1926.1401 A/D director (Assembly/Disassembly director) means an individual

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
individual that meets this standard's requirements of a competent and qualified person, or by a competent person who is assisted by one or more qualified persons, irrespective of the person's formal job title or whether the person is non-management or management personnel.	who meets this subpart's requirements for an A/D director, irrespective of the person's formal job title or whether the person is non-management or management personnel.
(2) "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.	1926.1401 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.
(3) "Assembly or disassembly" means the assembly, disassembly, or both, 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.	1926.1401 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.
(4) "Assist crane" means a crane used to assist in assembling or disassembling a crane.	1926.1401 Assist crane means a crane used to assist in assembling or disassembling a crane.
(5) "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.	1926.1401 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.
(6) "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.	1926.1401 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.
(7) "Base-mounted drum hoist" means a self-contained lifting unit which has a motor, a drum to receive the lifting cable, and mounting flanges for anchoring.	
(8) "Blocking," also referred to as ''cribbing," means wood or other material u8d to support equipment or a component and distribute loads to the ground. Blocking is typically used to support lattice boom sections during assembly/disassembly and under outrigger and stabilizer floats.	1926.1401 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.
(9) "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.	1926.1401 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.
(10) "Bogie" means ''travel bogie,'' as defined in R 408.41005a(73).	1926.1401 Bogie means "travel bogie," which is defined below.
(11) "Boom" when used on equipment other than a 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.	1926.1401 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.
(12) "Boom" or principle horizontal structure, when used on a tower crane, means if it is moveable up and down. If the ''boom'' is fixed, it is referred to as a jib.	1926.1401 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.
(13) "Boom angle indicator" means a device which measures the angle of the	1926.1401 Boom angle indicator means a device which measures the angle of

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
boom relative to horizontal.	the boom relative to horizontal.
(14) "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.	1926.1401 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.
(15) "Boom length indicator" indicates the length of the permanent part of the boom or the length of the boom with extensions/attachments.	1926.1401 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.
(16) “Boom stop” means a device that is used to limit the angle of the boom at the highest recommended position. Boom stop includes boom stops, belly straps with struts or 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.	1926.1401 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.
(17) "Boom suspension system" means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	1926.1401 Boom suspension system means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.
(18) "Builder" means the builder or constructor of equipment.	1926.1401 Builder means the builder/constructor of equipment.
(19) "Center of gravity" means the center of gravity of any object is the point in the object around which its weight is evenly distributed. If a support were put under that point, it could balance the object on the support.	1926.1401 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.
(20) "Certified welder" means a welder who meets nationally recognized certification requirements applicable to the task being performed.	1926.1401 Certified welder means a welder who meets nationally recognized certification requirements applicable to the task being performed.
(21) "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 using a system in which the entire crane is raised inside the structure (inside climbing).	1926.1401 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).
(22) "Come-a-long" means a mechanical device typically consisting of a chain or cable attached at each end that is used to facilitate movement of materials through leverage.	1926.1401 Come-a-long means a mechanical device typically consisting of a chain or cable attached at each end that is used to facilitate movement of materials through leverage.
(23) “Commercial truck-mounted crane” means a crane which consists of a rotating superstructure either a center post or turntable, a boom, operating machinery, and 1 or more operator’s stations, which is mounted on a frame that is attached to a commercial truck chassis, which typically retains a payload hauling capability, and which has a power source that typically powers the crane. The crane’s function is to lift, lower, and swing loads at various radii.	
(24) “Competent person” means a person who is trained, experienced, and capable of identifying an existing or potential hazard in surroundings, or under working conditions, that are hazardous or dangerous to an employee and who has the authority and knowledge to take prompt corrective measures to eliminate the hazards.	1926.1401 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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(25) "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.	1926.1401 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.
(26) "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 including its planning, quality, and completion.	1926.1401 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.
(27) “Counterweight” means a weight that is used to supplement the weight of the machine in providing stability for lifting working loads.	1926.1401 Counterweight means a weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.
(28) "Crane/derrick" includes all equipment covered by this standard.	1926.1401 Crane/derrick includes all equipment covered by this subpart.
(29) “Crawler crane” means a crane which consists of a rotating superstructure that has a power plant, operating machinery, and a boom and which is mounted on a base and equipped with crawler treads for travel. The crane’s function is to lift, lower, and swing loads at various radii.	1926.1401 Crawler crane means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.
(30) “Crawler excavator” means a device which consists of a rotating superstructure that has a power plant, operating machinery, and a boom, and which is mounted on a base, and which is equipped with crawler treads for travel. The function of the excavator is to dig, lift, lower, and swing loads at various radii.	
(31) "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, reaches the flange, and begins to wrap back in the opposite direction.	1926.1401 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, reaches the flange, and begins to wrap back in the opposite direction.
(32) "Dedicated channel" means a line of communication assigned by the employer who controls the communication system to only one signal person and a crane/derrick or to a coordinated group of cranes/derricks, signal person or persons.	1926.1401 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).
(33) "Dedicated pile-driver" means 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.	1926.1401 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.
(34) "Dedicated spotter" means an employee who meets the requirements for signal person qualifications and whose 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.	1926.1401 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.
(35) “Derrick” means powered equipment consisting of a mast or equivalent member that is held at or near the end by guys or braces, with or without a boom, and its hoisting mechanism. The mast or equivalent member, or the	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
load, or both are moved by the hoisting mechanism, which is 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.	
(36) "Directly under the load" means when any part of an employee is directly beneath the load.	1926.1401 Directly under the load means a part or all of an employee is directly beneath the load.
(37) "Dismantling" includes complete and partial dismantling, such as dismantling to shorten a boom or substitute a different component.	1926.1401 Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).
(38) "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.	1926.1401 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.
(39) “Dynamic loading” means the loads introduced into the machine or its components by forces in motion.	
(40) "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.	1926.1401 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.
(41) "Employer-made equipment" means floating cranes/derricks designed and built by an employer for the employer’s own use.	1926.1401 Employer-made equipment means floating cranes/derricks designed and built by an employer for the employer's own use.
(42) “Employer’s qualified evaluator” means a person employed by the signal person’s employer who has demonstrated that he or she is competent in accurately assessing whether individuals meet the requirements of R 408.41011a(3) for a signal person.	
(43) "Encroachment" means where any part of the crane, load line or load, including rigging and lifting accessories, breaches a minimum clearance distance that this standard requires to be maintained from a power line.	1926.1401 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.
(44) "Equipment" means equipment covered by this standard.	1926.1401 Equipment means equipment covered by this subpart.
(45) "Equipment criteria" means instructions, recommendations, limitations and specifications.	1926.1401 Equipment criteria means instructions, recommendations, limitations and specifications.
(46) "Fall protection equipment" means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	1926.1401 Fall protection equipment means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.
(47) "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.	1926.1401 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.
(48) "Fall zone" means the area, including but not limited to the 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.	1926.1401 Fall zone means the area (including but not limited to the 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.
(49) “Flange point” means a point of contact between the rope and the drum flange where the rope changes layers.	1926.1401 Flange points are points of contact between rope and drum flange where the rope changes layers.
(50) "Floating cranes/derricks" means equipment designed by the manufacturer or employer for marine use by permanent attachment to a barge,	1926.1401 Floating cranes/derricks means equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
pontoons, vessel or other means of flotation.	barge, pontoons, vessel or other means of flotation.
(51) "For example" means one example, although there are others.	1926.1401 For example means "one example, although there are others."
(52) "Free fall" 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.	1926.1401 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).
(53) "Free surface effect" means the uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.	1926.1401 Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel's transverse stability.
(54) "Friction drum hoist" means a hoist which has a drum that is controlled by friction clutches and brakes and which is provided with drum ratchets and pawls.	
(55) ''Ground conditions'' means the ability of the ground to support the equipment including, but not limited to slope, compaction, and firmness.	1926.1402(a)(1) "Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness).
(56) "Gudgeon pin" means a pin that is used to connect the base of a boom to the main frame.	
(57) "Hoist" means a system of power driven drums, gears, cables, chains, or hydraulic cylinders capable of lifting and lowering loads.	1926.1401 Hoist means a mechanical device for lifting and lowering loads by winding a line onto or off a drum.
(58) "Hoist tower" means a vertical structure used to support or house the platform and cab of an elevator or hoist.	
(59) "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.	1926.1401 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.
(60) "Include" or "including" means including, but not limited to.	1926.1401 Include/including means "including, but not limited to."
(61) "Insulating link or device" means an insulating device listed, labeled, or accepted by a nationally recognized resting laboratory in accordance with 29 CFR 1910.7.	1926.1401 Insulating link/device means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.
(62) "Jib stop" or "jib backstop" means the same type of device as a boom stop but is for a fixed or luffing jib.	1926.1401 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.
R 408.41005a Definitions; L to W.	
Rule 1005a. (1) "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 floatation.	1926.1401 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.
(2) "Landing" means the floor or stage elevation at which the cab or platform can be entered.	
(3) "Line pull" means the manufacturer's recommended load in pounds or kilograms applied to the rope attached to the hoist drum.	
(4) "List" means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	1926.1401 List means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.
(5) "Load" means to the object or objects being hoisted, the weight of the object or objects, or both. Both uses refer to the object or objects and the load-attaching equipment This could include the load block, ropes, slings, shackles, and any other ancillary attachment.	1926.1401 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.
(6) "Load moment or rated capacity indicator" means a system which aids the	1926.1401 Load moment (or rated capacity) indicator means a system which

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
equipment operator by directly or indirectly sensing the overturning moment on the equipment, i.e., load multiplied by radius. The system 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.	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 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.
(7) "Load moment or rated capacity limiter" means a system which aids the equipment operator by directly or indirectly sensing the overturning moment on the equipment, i.e., load multiplied by radius. The system compares this lifting condition to the equipment's rated capacity. When the rated capacity is reached, it shuts off power to those equipment functions that 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.	1926.1401 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.
(8) "Locomotive crane" means a crane which consists of a rotating superstructure that has a power plant, operating machinery, and a boom and which is mounted on a base or car that is equipped for travel on a railroad track. A locomotive crane may be self-propelled or propelled by an outside source. The crane's function is to lift, lower, and swing loads at various radii.	1926.1401 Locomotive crane means a crane mounted on a base or car equipped for travel on a railroad track.
(9) "Luffing jib limiting device" means a device that is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	1926.1401 Luffing jib limiting device is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.
(10) "Material hoist" means a mechanism for use in the hoisting or lowering of construction or demolition material. A material hoist is equipped with a platform, car, cage, or bucket that moves vertically on guide members.	
(11) "Marine hoisted personnel transfer device" means a device 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.	1926.1401 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.
(12) "Marine worksite" means a construction worksite located in, on or above the water.	1926.1401 Marine worksite means a construction worksite located in, on or above the water.
(13) "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.	1926.1401 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.
(14) "Moving point-to-point" means the times during which an employee is in the process of going to or from a work station.source. The crane's function is to lift, lower, and swing loads at various radii.	1926.1401 Moving point-to-point means the times during which an employee is in the process of going to or from a work station.
(15) "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 or tongs, for use as a forklift, or with a winch pack, jib with a hook at the end or a jib used in conjunction with a winch. When configured with the forks or tongs, it is	1926.1401 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 configured with the forks/tongs, it is not

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
not covered by this standard. When configured with a winch pack, jib with a hook at the end or a jib used in conjunction with a winch is covered by this standard.	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.
(16) "Nationally recognized accrediting agency" means 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.	1926.1401 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.
(17) "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.	1926.1401 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).
(18) "Operational aids" means devices that assist the operator in the safe operation of the crane by providing information or automatically taking control of a crane function.	1926.1401 Operational aids are devices that assist the operator in the safe operation of the crane by providing information or automatically taking control of a crane function. These include, but are not limited to, the devices listed in § 1926.1416 ("listed operational aids").
(19) "Operational controls" means levers, switches, pedals and other devices for controlling equipment operation.	1926.1401 Operational controls means levers, switches, pedals and other devices for controlling equipment operation.
(20) "Operator" means a person who is operating the equipment.	1926.1401 Operator means a person who is operating the equipment.
(21) "Overhead and gantry cranes" includes overhead, bridge, semi-gantry, cantilever gantry, wall, storage bridge, launching gantry cranes, and similar equipment, regardless of how it travels, whether on tracks, wheels, or other means.	1926.1401 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.
(22) “Pawl or dog” means a device for positively holding a member against motion in 1 or more directions.	
	1926.1401 Paragraph refers to a paragraph in the same section of this subpart that the word "paragraph" is used, unless otherwise specified.
(23) "Pendants" includes both wire and bar types. Wire type means a fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type means a bar is used instead of wire rope. 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.	1926.1401 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.
(24) "Personal fall arrest system" means a system used to arrest an employee in a fall from a working level. The system consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these.	1926.1401 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 lanyard, deceleration device, lifeline, or suitable combination of these.
(25) “Personnel hoist” means a type of elevator which is used for the raising or lowering of personnel and or materials and which is guided.	
(26) "Portal crane" means a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural	1926.1401 Portal crane is a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
gantry that 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.	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.
(27) “Power-controlled lowering” means a system or device in the power train, other than the load hoist brake, that can control the lowering rate of speed of the load hoist mechanism.	
(28) "Power lines" means electric transmission and distribution lines.	1926.1401 Power lines means electric transmission and distribution lines.
(29) “Procedures” means, but are not limited to, instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.	1926.1401 Procedures include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.
(30) "Proximity alarm" means 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.	1926.1401 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.
(31) “Qualified person” means a person who, through attainment of a recognized degree or certificate of professional standing or by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work.	1926.1401 Qualified person means a person who, by possession of a 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.
(32) “Qualified rigger” means an individual who is a qualified person with specific training and experience demonstrating the ability to solve or resolve problems relating to rigging.	1926.1401 Qualified rigger is a rigger who meets the criteria for a qualified person.
(33) “Qualified signal person” means an individual who is a qualified person with specific training and experience demonstrating the ability to solve or resolve problems relating to signaling.	
(34) “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.	1926.1401 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.
(35) "Range control warning device" means 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.	1926.1401 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.
(36) "Rated capacity" means the maximum working load permitted by the manufacturer under specified working conditions. These working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	1926.1401 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.
(37) "Rated capacity indicator" means the term as defined in R 408.41005a(7).	1926.1401 Rated capacity indicator: See load moment indicator.
(38) "Rated capacity limiter" means the term as defined in R 408.41005a(8).	1926.1401 Rated capacity limiter: See load moment limiter.
(39) “Reeving” means a rope system in which the rope travels around drums and sheaves.	
(40) "Repetitive pickup points" means, 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.	1926.1401 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.
(41) “Running rope” means a rope that travels around sheaves or drums.	
(42) "Running wire rope" means a wire rope that moves over sheaves or drums.	1926.1401 Running wire rope means a wire rope that moves over sheaves or drums.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(43) "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.	1926.1401 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.
(44) “Safety device” means a device used to prevent the unwanted or unsafe operation of a piece of equipment.	
	1926.1401 Section means a section of this subpart, unless otherwise specified.
(45) "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.	1926.1401 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.
(46) “Signal system” means an audible or visual method of communication between the equipment operator and the persons on the landing or floors.	
(47) "Special hazard warnings" means warnings of site-specific hazards, for example, proximity of power lines.	1926.1401 Special hazard warnings means warnings of site-specific hazards (for example, proximity of power lines).
(48) "Stability” as it pertains to flotation devices, 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.	1926.1401 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.
(49) "Standard method" means the protocol in Appendix A of this standard for hand signals.	1926.1401 Standard Method means the protocol in Appendix A of this subpart for hand signals.
(50) “Standing rope” including guy rope, means a supporting rope that maintains a constant distance between the points of attachment to the 2 components connected by the rope.	
(51) "Such as" means ‘‘such as, but not limited to.’’	1926.1401 Such as means "such as, but not limited to."
(52) "Superstructure" means upperworks.	1926.1401 Superstructure: See Upperworks.
(53) ‘‘Supporting materials’’ means blocking, mats, cribbing, marsh buggies in marshes or wetlands, or similar supporting materials or devices.	1926.1402(a)(2) "Supporting materials" means blocking, mats, cribbing, marsh buggies (in marshes/wetlands), or similar supporting materials or devices.
(54) "Tagline" means a rope, usually fiber, that is 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.	1926.1401 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.
(55) “Telescoping boom” means a base boom from which 1 or more boom sections are extended for additional length.	
(56) "Tender" means an individual responsible for monitoring and communicating with a diver.	1926.1401 Tender means an individual responsible for monitoring and communicating with a diver.
(57) “Third party qualified evaluator” means an entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the requirements of R 408.41011a(3) for a signal person.	
(58) "Tilt up or tilt down operation" means the raising or lowering of a load from the horizontal to vertical or vertical to horizontal.	1926.1401 Tilt up or tilt down operation means raising/lowering a load from the horizontal to vertical or vertical to horizontal.
(59) "Tower crane" means a type of lifting structure which utilizes a vertical mast or tower to support a working boom or jib in an elevated position. Loads are suspended from the working boom. While the working boom may be of	1926.1401 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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
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, referred to as top slewing, or by the rotation of the tower, referred to as bottom slewing. The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with a luffing jib or tower attachments are not considered tower cranes under this rule.	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.
(60) "Travel bogie" as it pertains to tower cranes, means an assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.	1926.1401 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.
(61) "Trim" means angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.	1926.1401 Trim means angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.
(62) “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. This binds the system and continued application of power can cause failure of the hoist rope or other component.	1926.1401 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. This binds the system and continued application of power can cause failure of the hoist rope or other component.
(63) "Unavailable procedures" means procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	1926.1401 Unavailable procedures means procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.
(64) "Upperstructure" means upperworks, as defined in subrule (78) of this rule.	1926.1401 Upperstructure: See Upperworks.
(65) "Upperworks" means the revolving frame of equipment on which the operating machinery, and in 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.	1926.1401 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.
(66) "Up to" means ‘‘up to and including.’’	1926.1401 Up to means "up to and including."
(67) “Winch head” means a rotating cylindrical drum that has curved end flanges and that is used for load handling by means of fiber rope coiled about its barrel with hand tension applied to the nonload end.	
(68) "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.	1926.1401 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.
(69) “Working day” means all calendar days except weekends and holidays.	
R 408.41006a Helicopter cranes.	
Rule 1006a. Helicopter cranes in construction shall be used in accordance with general industry safety standard part 59 “Helicopters,” as referenced in R 408.41003a.	
R 408.41007a Rescinded.	

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
R 408.41008a Operator qualification and certification.	1926.1427 Operator qualification and certification.
Rule 1008a. (1) The employer shall ensure that, prior to operating any equipment covered under this standard, the person is operating the equipment during a training period in accordance with subrule (5) of this rule, or the operator is qualified or certified to operate the equipment.	1926.1427(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:
MICHIGAN DOES NOT HAVE A CERTIFICATION PROGRAM	1926.1427(a)(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:
	1926.1427(a)(1)(i) Licensed by that government entity for operation of equipment within that entity's jurisdiction; or
	1926.1427(a)(1)(ii) qualified in compliance with paragraph (d) of this section.
	1926.1427(a)(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.
(a) Exceptions. Operator qualification or certification under this rule shall not be required for operators of any of the following: (i) Derricks. See R 408.41025a. (ii) Sideboom cranes. See R 408.41033a. (iii) Excavation equipment. See R 408.41041a. (iv) Material and personnel hoists, elevators. See R 408.41065a. (v) Equipment with a maximum manufacturer-rated hoisting or lifting capacity of 2,000 pounds or less. See R 408.41034a.	1926.1427(a)(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).
(b) When operator qualification or certification is required under R 408.41008a, the employer shall provide the qualification or certification at no cost to operators who are employed by the employer at the time these rules become effective.	1926.1427(a)(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 November 8, 2010.
(2) Option (1): Certification by an accredited crane operator testing organization.	1926.1427(b) Option (1): Certification by an accredited crane operator testing organization.
(a) For a testing organization to be considered accredited to certify operators under this standard, it shall comply with all of the following:	1926.1427(b)(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 have been met for all of the following: (A) Written testing materials. (B) Practical examinations. (C) Test administration. (D) Grading. (E) Facilities and equipment. (F) Personnel.	1926.1427(b)(1)(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:	1926.1427(b)(1)(ii) Administer written and practical tests that:
(A) Assess the operator applicant regarding, at a minimum, the knowledge	1926.1427(b)(1)(ii)(A) Assess the operator applicant regarding, at a minimum,

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
and skills listed in paragraphs (8)(a) and (b) of this rule.	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.	1926.1427(b)(1)(ii)(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.	1926.1427(b)(1)(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 recertification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (8)(a) and (b) of this rule.	1926.1427(b)(1)(iv) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical 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.	1926.1427(b)(1)(v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.
(b) An operator will be deemed qualified to operate a particular piece of equipment if the operator is certified under paragraph (2) of this rule 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.	1926.1427(b)(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.
(c) A certification issued under this option is portable.	1926.1427(b)(3) A certification issued under this option is portable and meets the requirements of paragraph (a)(2) of this section.
(d) A certification issued under this paragraph is valid for 5 years.	1926.1427(b)(4) A certification issued under this paragraph is valid for 5 years.
(3) Option (2): Qualification by an audited employer program. The employer's qualification of its employee must meet the following requirements:	1926.1427(c) Option (2): Qualification by an audited employer program. The employer's qualification of its employee must meet the following requirements:
(a) The written and practical tests must be either:	1926.1427(c)(1) The written and practical tests must be either:
(i) Developed by an accredited crane operator testing organization (see paragraph (2) of this rule); or	1926.1427(c)(1)(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:	1926.1427(c)(1)(ii) Approved by an auditor in accordance with the following requirements:
(A) The auditor is certified to evaluate such tests by an accredited crane operator testing organization (see paragraph (2) of this rule).	1926.1427(c)(1)(ii)(A) The auditor is certified to evaluate such tests by an accredited crane operator testing organization (see paragraph (b) of this section).
(B) The auditor is not an employee of the employer.	1926.1427(c)(1)(ii)(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 (8)(a) and (b) of this rule.	1926.1427(c)(1)(ii)(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.	1926.1427(c)(1)(ii)(D) The audit must be conducted in accordance with nationally recognized auditing standards.
(b) Administration of tests.	1926.1427(c)(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	1926.1427(c)(2)(i) The written and practical tests must be administered under circumstances approved by the auditor as meeting nationally recognized test

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
standards.	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 (2) of this rule).	1926.1427(c)(2)(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.	1926.1427(c)(2)(iii) The auditor must not be an employee of the employer.
(iv) The audit must be conducted in accordance with nationally recognized auditing standards.	1926.1427(c)(2)(iv) The audit must be conducted in accordance with nationally recognized auditing standards.
(c) The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter.	1926.1427(c)(3) The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter.
(d) 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 (8)(a) and (b) of this rule. The re-qualification procedures must be audited in accordance with paragraphs (3)(a) and (b) of this rule.	1926.1427(c)(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 re-qualification procedures must be audited in accordance with paragraphs (c)(1) and (2) of this section.
(e) Deficiencies. If the auditor determines that there is a significant deficiency (‘‘deficiency’’) in the program, the employer must ensure that:	1926.1427(c)(5) Deficiencies. If the auditor determines that there is a 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.	1926.1427(c)(5)(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.	1926.1427(c)(5)(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.	1926.1427(c)(5)(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.	1926.1427(c)(5)(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.
(f) A qualification under this paragraph is:	1926.1427(c)(6) A qualification under this paragraph is:
(i) Not portable. Such a qualification meets the requirements of paragraph (1) of this rule only where the operator is employed by (and operating the equipment for) the employer that issued the qualification.	1926.1427(c)(6)(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.	1926.1427(c)(6)(ii) Valid for 5 years.
	1926.1427(d) Option (3): Qualification by the U.S. military.
MIOSHA DOES NOT HAVE JURISDICTION OVER MILITARY, MARITIME, OR MINES.	1926.1427(d)(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.
	1926.1427(d)(2) A qualification under this paragraph is:
	1926.1427(d)(2)(i) Not portable. Such a qualification meets the requirements of

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
	paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the qualification.
	1926.1427(d)(2)(ii) Valid for the period of time stipulated by the issuing entity.
(4) Option (3): Licensing by a government entity.	1926.1427(e) Option (4): Licensing by a government entity.
(a) For purposes of this section, a government licensing department or 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 (4)(b) are met.	1926.1427(e)(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.
(b) Licensing criteria.	1926.1427(e)(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 (8)(a) and (b).	1926.1427(e)(2)(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.	1926.1427(e)(2)(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 or office has determined that the requirements in paragraphs (4)(b)(i) and (ii) have been met.	1926.1427(e)(2)(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 or office has testing procedures for re-licensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (8)(a) and (b) of this section	1926.1427(e)(2)(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.
(c) A license issued by a government accredited crane operator testing organization that meets the requirements of this option:	1926.1427(e)(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.	1926.1427(e)(3)(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.	1926.1427(e)(3)(ii) Is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.
(5) Pre-qualification/certification training period. An employee who is not qualified or certified under this rule is permitted to operate equipment only as an operator-in-training and only where the requirements of this paragraph are met.	1926.1427(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.
(a) 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 rule (including continuous monitoring) and any additional limitations established by the employer.	1926.1427(f)(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.
(b) The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training's ability.	1926.1427(f)(2) The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training's ability.
(c) Trainer. While operating the equipment, the operator-in-training must be continuously monitored by an individual (''operator's trainer'') who meets all of	1926.1427(f)(3) Trainer. While operating the equipment, the operator-in-training must be continuously monitored by an individual ("operator's trainer")

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
the following requirements:	who meets all of the following requirements:
(i) The operator's trainer is an employee or agent of the operator-in-training's employer.	1926.1427(f)(3)(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 rule, or has passed the written portion of a certification test under one of the options in paragraphs (2) through (4) of this rule, and is familiar with the proper use of the equipment's controls.	1926.1427(f)(3)(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.	1926.1427(f)(3)(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 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.	1926.1427(f)(3)(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 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.
(d) 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:	1926.1427(f)(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.	1926.1427(f)(4)(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.	1926.1427(f)(4)(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.	1926.1427(f)(4)(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.
(e) The operator-in-training must not operate the equipment in any of the following circumstances unless the exception stated in paragraph (4)(e)(v) of this rule is applicable:	1926.1427(f)(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 as prescribed in R 408.41016b(1)(a), 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.	1926.1427(f)(5)(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.	1926.1427(f)(5)(ii) If the equipment is used to hoist personnel.
(iii) In multiple-equipment lifts.	1926.1427(f)(5)(iii) In multiple-equipment lifts.
(iv) If the equipment is used over a shaft, cofferdam, or in a tank farm.	1926.1427(f)(5)(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.	1926.1427(f)(5)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(6) Under this rule, 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.	1926.1427(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.
(7) Language and Literacy Requirements.	1926.1427(h) Language and Literacy Requirements.
(a) Tests under this rule may be administered verbally, with answers given verbally, where the operator candidate:	1926.1427(h)(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.	1926.1427(h)(1)(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.	1926.1427(h)(1)(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.
(b) Tests under this rule 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 (2)(b) of this rule 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.	1926.1427(h)(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.
	1926.1427(i) [Reserved.]
(8) Certification criteria. Qualifications and certifications must be based, at a minimum, on the following:	1926.1427(j) Certification criteria. Qualifications and certifications must be based, at a minimum, on the following:
(a) A determination through a written test that:	1926.1427(j)(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:	1926.1427(j)(1)(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.	1926.1427(j)(1)(i)(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.	1926.1427(j)(1)(i)(B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.
(C) Procedures for preventing and responding to power line contact.	1926.1427(j)(1)(i)(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 standard applicable to the specific type of equipment the individual will operate. Use of the Appendix C criteria meets the requirements of this provision.	1926.1427(j)(1)(i)(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:	1926.1427(j)(1)(i)(E) Technical knowledge applicable to:
(I) The suitability of the supporting ground and surface to handle expected loads.	1926.1427(j)(1)(i)(E)(1) The suitability of the supporting ground and surface to handle expected loads.
(II) Site hazards.	1926.1427(j)(1)(i)(E)(2) Site hazards.
(III) Site access.	1926.1427(j)(1)(i)(E)(3) Site access.
(F) This subpart, including applicable incorporated materials.	1926.1427(j)(1)(i)(F) This subpart, including applicable incorporated materials.
(ii) The individual is able to read and locate relevant information in the	1926.1427(j)(1)(ii) The individual is able to read and locate relevant information

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
equipment manual and other materials containing information referred to in paragraph (8)(a)(i) of this rule.	in the equipment manual and other materials containing information referred to in paragraph (j)(1)(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:	1926.1427(j)(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 R 408.41012a(5).	1926.1427(j)(2)(i) Ability to recognize, from visual and auditory observation, the items listed in § 1926.1412(d) (shift inspection).
(ii) Operational and maneuvering skills.	1926.1427(j)(2)(ii) Operational and maneuvering skills.
(iii) Application of load chart information.	1926.1427(j)(2)(iii) Application of load chart information.
(iv) Application of safe shut-down and securing procedures.	1926.1427(j)(2)(iv) Application of safe shut-down and securing procedures.
(9) Phase-in.	1926.1427(k) Phase-in.
(a) The provisions of this rule are applicable at the effective date of these rules, except for paragraphs (1)(b) and (5) which are applicable as of November 8, 2014.	1926.1427(k)(1) The provisions of this section are applicable November 8, 2010, except for paragraphs (a)(2) and (f) which are applicable November 10, 2014.
(b) When R 408.41008a(1)(a) is not applicable, all of the requirements in paragraphs (9)(b)(i) and (ii) of this rule apply until November 8, 2014:	1926.1427(k)(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 November 10, 2014:
(i) The employer must ensure that operators of equipment covered by this standard are competent to operate the equipment safely.	1926.1427(k)(2)(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.	1926.1427(k)(2)(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.
R 408.41009a Training	1910.1430 Training
The employer shall provide training as follows: (a) Overhead powerlines. The employer shall train each employee specified in R 408.41016b(7) and R 408.41016d(m) in the topics listed in R 408.41016b(7).	1910.1430(a) The employer must provide training as follows: (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).
(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 R 408.41011a(3) in the areas addressed in that paragraph.	1910.1430(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.
(c) Operators. (i) Operators-in-Training for equipment where certification or qualification is required by this subpart. The employer shall train each operator-in-training in the areas addressed in R 408.41008a(8). The employer shall provide re-training if the operator-in-training does not pass a qualification or certification test.	1910.1430(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.
(ii) Transitional Period. During the phase-in period for operator certification or qualification, as provided in R 408.41008a(9), employers shall train each operator who has not yet been certified or qualified in the areas addressed in R 408.41008a(8).	1910.1430(c)(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).

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(iii) Operators excepted from the requirements of R 408.41008a. The employer shall train each operator excepted under R 408.41008a(1) from the requirements of R 408.41008a on the safe operation of the equipment the operator will be using.	1910.1430(c)(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.
(d) The employer must train each operator of the equipment covered by this subpart in the following practices:	1910.1430(c)(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. An operator shall test the hoisting brakes before moving a near maximum rated load by raising the load a few inches and applying the hoisting brakes. This requirement applies to both single and multiple line reeving. See R 408.41019b(3) and (6) for additional requirements.	1910.1430(c)(4)(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 persons.	1910.1430(c)(4)(ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.
(e) 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.	1910.1430(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.
(f) 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 R 408.41022a.	1910.1430(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).
(g) 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 §§ 408.1019b(5) and (6).	1910.1430(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).
(h) Training administration.	1910.1430(g) Training administration.
(i) 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.	1910.1430(g)(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.
(ii) The employer must provide refresher training in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.	1910.1430(g)(2) The employer must provide refresher training in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.
(iii) Whenever training is required under the part, the employer must provide the training at no cost to the employee.	1910.1430(g)(3) Whenever training is required under subpart CC, the employer must provide the training at no cost to the employee.
R 408.41009b Qualifications of maintenance and repair employees.	1926.1429 Qualifications of maintenance& repair employees.
Rule 1009b. (1) Maintenance, inspection and repair personnel may be permitted to operate the equipment only when all of the following requirements are met:	1926.1429(a) Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following requirements are met:
(a) The operation is limited to those functions necessary to perform	1926.1429(a)(1) The operation is limited to those functions necessary to

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
maintenance, inspect the equipment, or verify its performance.	perform maintenance, inspect the equipment, or verify its performance.
(b) The personnel do either of the following:	1926.1429(a)(2) The personnel either:
(i) Operate the equipment under the direct supervision of an operator who meets the requirements of R 408.41008a.	1926.1429(a)(2)(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, characteristics and hazards associated with the type of equipment.	1926.1429(a)(2)(ii) Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment.
(2) Maintenance and repair personnel shall meet the definition of a qualified person with respect to the equipment and maintenance or repair tasks performed.	1926.1429(b) Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.
R 408.41011a Signals person qualifications.	1926.1428 Signal person qualifications.
Rule 1011a. (1) The employer of the signal person shall ensure that each signal person meets the qualification requirements as prescribed in subrule (c) of this rule prior to giving any signals. This requirement shall be met by using either Option (1) or Option (2) of this rule.	1926.1428(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. This requirement must be met by using either Option (1) or Option (2) of this section.
(a) Option (1)—Third party qualified evaluator. The signal person has documentation from a third party qualified evaluator as defined in R 408.41005a showing that the signal person meets the qualification requirements as prescribed in subrule (3) of this rule.	1910.1428(a)(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).
(b) Option (2)—Employer's qualified evaluator. The employer's qualified evaluator as defined in R 408.41004a shall assess the individual and determine that he or she meets the qualification requirements as prescribed in subrule (3) of this rule and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option shall not be portable. Other employers shall not be permitted to use it to meet the requirements of this rule.	1910.1428(a)(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.
(c) The employer shall make the documentation for whichever option is used available at the site while the signal person is employed by the employer. The documentation shall specify each type of signaling, such as hand signals and radio signals, for which the signal person meets the requirements of subrule (3) of this rule.	1910.1428(a)(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.
(2) If subsequent actions by the signal person indicate that the individual does not meet the qualification requirements as provided in subrule (3) of this rule, the employer shall not allow the individual to continue working as a signal person until retraining is provided and a reassessment is made in accordance with subrule (1) of this rule that confirms that the individual meets the qualification requirements.	1910.1428(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 reassessment is made in accordance with paragraph (a) of this section that confirms that the individual meets the Qualification Requirements.
(3) Qualification requirements. The signal person shall:	1910.1428(c) Qualification Requirements. Each signal person must:
(a) Know and understand the type of signals used. If hand signals are used, the signal person shall know and understand the standard method for hand signals.	1910.1428(c)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(b) Be competent in the application of the type of signals used.	1910.1428(c)(2) Be competent in the application of the type of signals used.
(c) 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.	1910.1428(c)(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.
(d) Know and understand the relevant requirements of R 408.41011a to R 408.41011c.	1910.1428(c)(4) Know and understand the relevant requirements of § 1926.1419 through § 1926.1422 and § 1926.1428.
(e) Demonstrate that he or she meets the requirements in subrules (3)(a) to (d) of this rule through an oral or written test and a practical test.	1910.1428(c)(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.
R 408.41011b Signals; general requirements.	1926.1419 Signals—general requirements.
Rule 1011b. (1) A signal person shall be provided in each of the following situations:	1926.1419(a) A signal person 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.	1926.1419(a)(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.
(b) When the equipment is traveling, the view in the direction of travel is obstructed.	1926.1419(a)(2) When the equipment 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.	1926.1419(a)(3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.
(2) Types of signals. Signals to operators shall be by hand, voice, audible, or new signals.	1926.1419(b) Types of signals. Signals to operators must be by hand, voice, audible, or new signals.
(3) Hand signals.	1926.1419(c) Hand signals.
(a) When using hand signals, the standard method shall be used. See Appendix A of this standard. Exception: When use of the standard method for hand signals is infeasible, or when an operation or use of an attachment is not covered in the standard method, nonstandard hand signals may be used in accordance with subrule (3)(b) of this rule.	1926.1419(c)(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, nonstandard hand signals may be used in accordance with paragraph (c)(2) 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, shall contact each other prior to the operation and agree on the non-standard hand signals that will be used.	1926.1419(c)(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 will be used.
(4) New signals. Signals other than hand, voice, or audible signals may be used when the employer demonstrates either of the following:	1926.1419(d) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that:
(a) The new signals provide at least equally effective communication as voice, audible, or standard method hand signals.	1926.1419(d)(1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or
(b) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or standard method hand signals.	1926.1419(d)(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.
(5) Suitability. The signals used, such as hand, voice, or audible, and means of transmitting the signals to the operator, such as direct line of sight, video, and radio, shall be appropriate for the site conditions.	1926.1419(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.
(6) During operations requiring signals, the ability to transmit signals between	1926.1419(f) During operations requiring signals, the ability to transmit signals

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
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.	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.
(7) If the operator becomes aware of a safety problem and needs to communicate with the signal person, he or she shall safely stop operations. Operations shall not resume until the operator and signal person agree that the problem has been resolved.	1926.1419(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.
(8) Only one person shall give signals to a crane or derrick at a time, except in circumstances covered by subrule (10) of this rule.	1926.1419(h) Only one person may give signals to a crane/derrick at a time, except in circumstances covered by paragraph (j) of this section.
(9) [Reserved.]	1926.1419(i) [Reserved.]
(10) Anyone who becomes aware of a safety problem shall alert the operator or signal person by giving the stop or emergency stop signal.	1926.1419(j) Anyone who becomes aware of a safety problem must 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).
(11) All directions given to the operator by the signal person shall be given from the operator's direction perspective.	1926.1419(k) All directions given to the operator by the signal person must be given from the operator's direction perspective.
(12) [Reserved.]	1926.1419(l) [Reserved.]
(13) Communication with multiple cranes or derricks. When the signal person or persons communicates with more than one crane or derrick, a system shall be used to identify the crane or derrick each signal is for, by one of the following:	1926.1419(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:
(a) The signal person shall identify for each signal the crane or derrick that the signal is for prior to giving the function, direction, or both.	1926.1419(m)(1) for each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for, or
(b) Use an equally effective method of identifying which crane or derrick the signal is for.	1926.1419(m)(2) must use an equally effective method of identifying which crane/derrick the signal is for.
R 408.41011c Signals; radio, telephone, or other electronic transmission of signals.	1926.1420 Signals—radio, telephone or other electronic transmission of signals.
Rule 1011c. (1) The devices used to transmit signals shall be tested on site before beginning operations to ensure that the signal transmission is clear and reliable.	1926.1420(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.
(2) Signal transmission shall be through a dedicated channel except under the following circumstances:	1926.1420(b) Signal transmission must be through a dedicated channel, except:
(a) When multiple cranes or derricks are used for the same task, one or more qualified signal persons may share a dedicated channel for the purpose of coordinating operations.	1926.1420(b)(1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations.
(b) When 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.	1926.1420(b)(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.
(3) The crane or derrick operator shall receive signals using a hands-free device.	1926.1420(c) The operator's reception of signals must be by a hands-free system.
R 408.41011d Signals; voice signals; additional requirements.	1926.1421 Signals—voice signals— additional requirements.
Rule 1011d. (1) The operator, signal person and lift director, if there is one,	1926.1421(a) Prior to beginning operations, the operator, signal person and lift

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
shall contact each other and agree on the voice signals that will be used prior to beginning operations. These individuals shall meet again if any of the following occurs: (a) A worker is substituted or added. (b) There is confusion about the voice signals. (c) Voice signals are to be changed.	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.
(2) Each voice signal shall contain the following 3 elements, given in the following order:	1926.1421(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.
(a) Function, such as hoist or boom, direction.	1926.1421(c) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.
(b) Distance or speed, or both.	
(c) Function, stop command.	
(3) The operator, signal person and lift director, if there is one, involved shall be able to effectively communicate in the language used.	
R 408.41011e Signals; hand signal chart.	1926.1422 Signals—hand signal chart.
Rule 1011e. Hand signal charts shall be posted either on the crane or derrick or be readily available on site.	Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.
R 408.41012a Inspections.	1926.1412 Inspections.
(1) An employer shall maintain crane, derrick, or excavation equipment and accessories in a condition that shall not endanger an operator or other employees.	CURRENT MIOSHA R 408.41006a(4)
(2) Modified equipment.	1926.1412(a) Modified equipment.
(a) Equipment that has had modifications or additions which affect the safe operation of the equipment or capacity shall be inspected by a qualified person after such modifications and additions have been completed, prior to initial use. These modifications or additions may include 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. The inspection shall meet all of the following requirements:	1926.1412(a)(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 shall assure that the modifications or additions have been done in accordance with the approval obtained pursuant to R 408.41028a.	1926.1412(a)(1)(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 shall include functional testing of the equipment.	1926.1412(a)(1)(ii) The inspection must include functional testing of the equipment.
(b) Equipment shall not be used until an inspection under this rule demonstrates that the requirements of subrule (2)(a)(i) have been met.	1926.1412(a)(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.
(3) Repaired or adjusted equipment.	1926.1412(b) Repaired/adjusted equipment.
(a) Equipment that has had a repair or adjustment that relates to safe operation shall be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use. These repairs and	1926.1412(b)(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-

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
adjustments may include 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. The inspection shall meet all of the following requirements:	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 shall determine if the repair or adjustment meets manufacturer equipment criteria where applicable and available.	1926.1412(b)(1)(i) The qualified person must determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available).
(ii) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person shall do both of the following:	1926.1412(b)(1)(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 or 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 the criteria are developed by an RPE.	1926.1412(b)(1)(ii)(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 or adjustment meets the criteria developed in accordance with subrule (3)(ii)(A).	1926.1412(b)(1)(ii)(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 of the repaired or adjusted parts and other components that may be affected by the repair or adjustment.	1926.1412(b)(1)(iii) The inspection must include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment.
(b) Equipment shall not be used until an inspection under this subrule demonstrates that the repair or adjustment meets the requirements of subrule (3)(a)(i) of this subrule or, where applicable, subrule (3)(a)(ii).	1926.1412(b)(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).
(4) Post-assembly.	1926.1412(c) Post-assembly.
(a) 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.	1926.1412(c)(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.
(b) When manufacturer equipment criteria are unavailable, a qualified person shall do both of the following:	1926.1412(c)(2) Where manufacturer equipment criteria are unavailable, a qualified person must:
(i) Determine if an RPE who is 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 the criteria are developed by an RPE.	1926.1412(c)(2)(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 in accordance with subrule (4)(b)(i).	1926.1412(c)(2)(ii) Determine if the equipment meets the criteria developed in accordance with paragraph (c)(2)(i) of this section.
(c) Equipment shall not be used until an inspection under this subrule demonstrates that the equipment is configured in accordance with the applicable criteria.	1926.1412(c)(3) Equipment must not be used until an inspection under this paragraph demonstrates that the equipment is configured in accordance with the applicable criteria.
(5) Each shift.	1926.1412(d) Each shift.
(a) A competent person shall begin a visual inspection prior to each shift the equipment will be used. The inspection shall be completed before or during that shift and shall consist of observation for apparent deficiencies. Taking	1926.1412(d)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
apart equipment components and booming down shall not be required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitates taking apart equipment components or booming down. Determinations made in conducting the inspection shall be reassessed in light of observations made during operation. At a minimum the inspection shall include all of the following:	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.	1926.1412(d)(1)(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.	1926.1412(d)(1)(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.	1926.1412(d)(1)(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.	1926.1412(d)(1)(iv) Hydraulic system for proper fluid level.
(v) Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat.	1926.1412(d)(1)(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.	1926.1412(d)(1)(vi) Wire rope reeving for compliance with the manufacturer's specifications.
(vii) Wire rope, in accordance with R 408.41013a.	1926.1412(d)(1)(vii) Wire rope, in accordance with § 1926.1413(a).
(viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.	1926.1412(d)(1)(viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.
(ix) Tires, when in use, for proper inflation and condition.	1926.1412(d)(1)(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 or stabilizers and supporting foundations, ground water accumulation, or similar conditions. This subrule shall 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.	1926.1412(d)(1)(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.	1926.1412(d)(1)(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.	1926.1412(d)(1)(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 subrule shall 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.	1926.1412(d)(1)(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.	1926.1412 d)(1)(xiv) Safety devices and operational aids for proper operation.
(b) If any deficiency in subrules (5)(a)(i) to (5)(a)(xiii) or in additional inspection items required to be checked for specific types of equipment in accordance with other rules of this standard is identified, an immediate	1926.1412(d)(2) If any deficiency in paragraphs (d)(1)(i) through (xiii) 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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
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 taken out of service until it has been corrected, as specified in R 408.41019b.	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.
(c) If there is any deficiency in safety devices and operational aids for proper operation identified, the action specified in R 408.41018a and R 408.41019a shall be taken prior to using the equipment.	1926.1412(d)(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.
(6) Monthly.	1926.1412(e) Monthly.
(a) Each month the equipment is in service it shall be inspected in accordance with subrule (5) of this rule.	1926.1412(e)(1) Each month the equipment is in service it must be inspected in accordance with paragraph (d) of this section (each shift).
(b) Equipment shall not be used until an inspection under this subrule demonstrates that no corrective action under subrule (5)(b) and (c) is required.	1926.1412(e)(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.
(c) Documentation.	1926.1412(e)(3) Documentation.
(i) The following information shall be documented and maintained by the employer that conducts the inspection:	1926.1412(e)(3)(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.	1926.1412(e)(3)(i)(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.	1926.1412(e)(3)(i)(B) The name and signature of the person who conducted the inspection and the date.
(ii) This document shall be retained for a minimum of three months.	1926.1412(e)(3)(ii) This document must be retained for a minimum of three months.
(7) Annual.	1926.1412(f) Annual/comprehensive.
(a) At least every 12 months, the equipment shall be inspected by a qualified person in accordance with subrule (5) except that the corrective action set forth in subrules (7)(d), (e), and (f) shall apply in place of the corrective action required by subrule (5)(b) and (c).	1926.1412(f)(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.
(b) In addition, at least every 12 months, the equipment shall be inspected by a qualified person. Disassembly shall be required, as necessary, to complete the inspection. The equipment and equipment structure including the boom and, if equipped, the jib, shall be inspected for all of the following:	1926.1412(f)(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: 1926.1412(f)(2)(i) Equipment structure (including the boom and, if equipped, the jib):
(i) Deformed, cracked, or significantly corroded structural members.	1926.1412(f)(2)(i)(A) Structural members: Deformed, cracked, or significantly corroded.
(ii) Loose, failed or significantly corroded bolts, rivets and other fasteners.	1926.1412 (f)(2)(i)(B) Bolts, rivets and other fasteners: loose, failed or significantly corroded.
(iii) Cracked welds.	1926.1412(f)(2)(i)(C) Welds for cracks.
(iv) Sheaves and drums for cracks or significant wear.	1926.1412(f)(2)(ii) Sheaves and drums for cracks or significant wear.
(v) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.	1926.1412(f)(2)(iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.
(vi) Brake and clutch system parts, linings, pawls and ratchets for excessive wear.	1926.1412(f)(2)(iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(vii) Safety devices and operational aids for proper operation, including significant inaccuracies.	1926.14212(f)(2)(v) Safety devices and operational aids for proper operation (including significant inaccuracies).
(viii) Gasoline, diesel, electric, or other power plants for proper operation and safety-related problems or conditions, such as a leaking exhaust and an emergency shut-down feature.	1926.1412(f)(2)(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.
(ix) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.	1926.1412(f)(2)(vii) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.
(x) Travel steering, brakes, and locking devices, for proper operation.	1926.1412(f)(2)(viii) Travel steering, brakes, and locking devices, for proper operation.
(xi) Tires for damage or excessive wear.	1926.1412(f)(2)(ix) Tires for damage or excessive wear.
(xii) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows:	1926.1412(f)(2)(x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows:
(A) A flexible hose or its junction with the fittings for indications of leaks.	1926.1412(f)(2)(x)(A) Flexible hose or its junction with the fittings for indications of leaks.
(B) Threaded or clamped joints for leaks.	1926.1412(f)(2)(x)(B) Threaded or clamped joints for leaks.
(C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure or impending failure.	1926.1412(f)(2)(x)(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.	1926.1412(f)(2)(x)(D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.
(xiii) Hydraulic and pneumatic pumps and motors, as follows:	1926.1412(f)(2)(xi) Hydraulic and pneumatic pumps and motors, as follows:
(A) Performance indicators for unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure.	1926.1412(f)(2)(xi)(A) Performance indicators: Unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure.
(B) Loose bolts or fasteners.	1926.1412(f)(2)(xi)(B) Loose bolts or fasteners.
(C) Shaft seals and joints between pump sections for leaks.	1926.1412(f)(2)(xi)(C) Shaft seals and joints between pump sections for leaks.
(xiv) Hydraulic and pneumatic valves, as follows:	1926.1412(f)(2)(xii) Hydraulic and pneumatic valves, as follows:
(A) Spools for sticking, improper return to neutral, and leaks.	1926.1412(f)(2)(xii)(A) Spools: Sticking, improper return to neutral, and leaks.
(B) Leaks.	1926.1412(f)(2)(xii)(B) Leaks.
(C) Valve housing cracks.	1926.1412(f)(2)(xii)(C) Valve housing cracks.
(D) Relief valves for failure to reach correct pressure. If there is a manufacturer procedure for checking pressure, it shall be followed.	1926.1412(f)(2)(xii)(D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed).
(xv) Hydraulic and pneumatic cylinders, as follows:	1926.1412(f)(2)(xiii) Hydraulic and pneumatic cylinders, as follows:
(A) Drifting caused by fluid leaking across the piston.	1926.1412(f)(2)(xiii)(A) Drifting caused by fluid leaking across the piston.
(B) Rod seals and welded joints for leaks.	1926.1412(f)(2)(xiii)(B) Rod seals and welded joints for leaks.
(C) Cylinder rods for scores, nicks, or dents.	1926.1412(f)(2)(xiii)(C) Cylinder rods for scores, nicks, or dents.
(D) Case or barrel for significant dents.	1926.1412(f)(2)(xiii)(D) Case (barrel) for significant dents.
(E) Rod eyes and connecting joints that are loose or deformed.	1926.1412(f)(2)(xiii) (E) Rod eyes and connecting joints: Loose or deformed.
(xvi) Outrigger or stabilizer pads or floats for excessive wear or cracks.	1926.1412(f)(2)(xiv) Outrigger or stabilizer pads/floats for excessive wear or cracks.
(xvii) Slider pads for excessive wear or cracks.	1926.1412(f)(2)(xv) Slider pads for excessive wear or cracks.
(xviii) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.	1926.1412(f)(2)(xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(xix) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard that are missing or unreadable.	1926.1412(f)(2)(xvii) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: Missing or unreadable.
(xx) Originally equipped operator seat or equivalent that are missing.	1926.1412(f)(2)(xviii) Originally equipped operator seat (or equivalent): Missing.
(xxi) Operator seat that is unserviceable.	1926.1412(f)(2)(xix) Operator seat: Unserviceable.
(xxii) Originally equipped steps, ladders, handrails, and guards that are missing.	1926.1412(f)(2)(xx) Originally equipped steps, ladders, handrails, guards: Missing.
(xxiii) Steps, ladders, handrails, and guards that are in unusable or unsafe condition.	1926.1412(f)(2)(xxi) Steps, ladders, handrails, guards: In unusable/unsafe condition.
(c) This inspection shall include functional testing of the equipment as configured to determine if it is functioning properly.	1926.1412(f)(3) This inspection must include functional testing to determine that the equipment as configured in the inspection is functioning properly.
(d) 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.	1926.1412(f)(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.
(e) If the qualified person determines that a deficiency is a safety hazard, the equipment shall be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in R 408.41019a(4) or R 408.41029a(4)(c), as specified in R 408.41019b.	1926.1412(f)(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.
(f) 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.	1926.1412(f)(6) 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.
(g) Documentation of annual inspection. The following information shall be documented, maintained, and retained for a minimum of 12 months by the employer that conducts the inspection:	1926.1412(f)(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.	1926.1412(f)(7)(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.	1926.1412(f)(7)(ii) The name and signature of the person who conducted the inspection and the date.
(iii) The employer shall maintain, on the jobsite, a copy of the records of the date and results of the latest inspection for each piece of equipment.	CURRENT MIOSHA R 408.41013a(2)
(8) Severe service. Where the severity of use or conditions is such that there is a reasonable probability of damage or excessive wear, such as loading, or shock loading, that may have exceeded rated capacity, or prolonged exposure to a corrosive atmosphere, the employer shall stop using the equipment and a qualified person shall do all of the following:	1926.1412(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:
(a) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely.	1926.1412(g)(1) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely.
(b) In light of the use or conditions determine whether any items and conditions listed in subrule (7) need to be inspected. If an inspection is needed, the qualified person shall inspect those items and conditions.	1926.1412(g)(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.
(c) If a deficiency is found, the employer shall follow the requirements in subrules (7)(d) to (7)(f).	1926.1412(g)(3) If a deficiency is found, the employer must follow the requirements in paragraphs (f)(4) through (6) of this section.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(9) 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 subrule (6) before initial use.	1926.1412(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.
(10) [Reserved.]	1926.1412(i) [Reserved.]
(11) Any part of a manufacturer's procedures regarding inspections that relate to safe operation that is more comprehensive or has a more frequent schedule of inspection than the requirements of this rule shall be followed.	1926.1412(j) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to 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) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section must be followed.
(12) All documents produced under this rule shall be available, during the applicable document retention period, to all persons who conduct inspections under this rule.	1926.1412(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.
R 408.41013a Wire rope inspection.	1926.1413 Wire rope—inspection.
Rule 1013a. (1) A wire rope that is in continuous service shall be visually inspected by a competent person prior to each shift. A visual inspection shall consist of observing all rope, including running and standing, that can be expected to be in use during the day's operations. The purpose of the visual observations shall be to discover damage that may be an immediate hazard. Untwisting or opening of wire rope or booming down is not required as part of this inspection.	1926.1413(a)(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) The frequency of wire rope inspection shall be determined by a qualified person and shall be based on all of the following factors: (a) Expected rope life as determined through experience on the particular installation or similar installations. (b) Severity of the environment. (c) Percentage of capacity lifts. (d) Frequency rates of operation. (e) Exposure to shock loads. Inspections need not be at equal calendar intervals and shall be more frequent as the rope approaches the end of its useful life.	CURRENT MIOSHA R 408.41033a(3)
(3) Category I. Apparent deficiencies in this category include any of the following:	1926.1413(a)(2)(i) Category I. Apparent deficiencies in this category include the following:
(a) Significant distortion of the rope, including any of the following:	1926.1413(a)(2)(i)(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.
(i) Kinking.	1926.1413(a)(2)(i)(C) Electric arc damage (from a source other than power lines) or heat damage.
(ii) Crushing.	1926.1413(a)(2)(i)(D) Improperly applied end connections.
(iii) Unstranding.	
(iv) Birdcaging.	
(v) Main strand displacement.	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(vi) Signs of core failure or steel core protrusion between the outer strands.	
(b) Electric arc damage, from a source other than power lines, or heat damage.	
(c) Improperly applied end connections.	
(d) Significantly corroded, cracked, bent, or worn end connections, such as from severe service.	1926.1413(a)(2)(i)(E) Significantly corroded, cracked, bent, or worn end connections (such as from severe service).
(4) Category II. Apparent deficiencies in this category are any of the following:	1926.1413(a)(2)(ii) Category II. Apparent deficiencies in this category are:
(a) Broken or cut strands.	1926.1413(a)(2)(ii)(A) Visible broken wires, as follows:
(b) In running wire ropes, 6 randomly distributed broken wires in 1 rope lay or 3 broken wires in 1 strand in 1 rope lay, where a rope lay is the length along the rope in which 1 strand makes a complete revolution around the rope.	1926.1413(a)(2)(ii)(A)(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.
(c) In rotation-resistant ropes, 2 randomly distributed broken wires in 6 rope diameters or 4 randomly distributed broken wires in 30 rope diameters.	1926.1413(a)(2)(ii)(A)(2) In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters.
(d) In standing ropes, there are more than 2 broken wires in 1 rope lay in sections beyond end connections or more than 1 broken wire at an end connection.	1926.1413(a)(2)(ii)(A)(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.
(e) A diameter reduction of more than 5% from nominal diameter.	1926.1413(a)(2)(ii)(B) A diameter reduction of more than 5% from nominal diameter.
(5) Category III. Apparent deficiencies in this category include any of the following:	1926.1413(a)(2)(iii) Category III. Apparent deficiencies in this category include the following:
(a) In rotation resistant wire rope, core protrusion or other distortion indicating core failure.	1926.1413(a)(2)(iii)(A) In rotation resistant wire rope, core protrusion or other distortion indicating core failure.
(b) Prior electrical contact with a power line.	1926.1413(a)(2)(iii)(B) Prior electrical contact with a power line.
(c) A broken strand.	1926.1413(a)(2)(iii)(C) A broken strand.
(6) Critical review items. The competent person shall give particular attention to all of the following:	1926.1413(a)(3) Critical review items. The competent person must give particular attention to all of the following:
(a) Rotation resistant wire rope in use.	1926.1413(a)(3)(i) Rotation resistant wire rope in use.
(b) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.	1926.1413(a)(3)(ii) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends.
(c) Wire rope at flange points, crossover points and repetitive pickup points on drums.	1926.1413(a)(3)(iii) Wire rope at flange points, crossover points and repetitive pickup points on drums.
(d) Wire rope at or near terminal ends.	1926.1413(a)(3)(iv) Wire rope at or near terminal ends.
(e) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.	1926.1413(a)(3)(v) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.
(7) Removal from service.	1926.1413(a)(4) Removal from service.
(a) If a deficiency in Category I 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 one of the following occurs:	1926.1413(a)(4)(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:

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(i) The wire rope is replaced, as specified in R 408.41019b.	1926.1413(a)(4)(i)(A) The wire rope is replaced (see § 1926.1417), or
(ii) If the deficiency is localized, the problem shall be corrected by severing the wire rope in 2. The undamaged portion may continue to be used. Joining lengths of wire rope by splicing shall be prohibited. If a rope is shortened under this subrule, the employer shall ensure that the drum will have 2 wraps of wire when the load, boom, or both is in the lowest position.	1926.1413(a)(4)(i)(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.
(iii) The defective portion of a wire rope that is removed shall not be used for other load-carrying service.	CUURENT MIOSHA R408.41033a(3)
(b) If a deficiency in Category II is identified, operations involving use of the wire rope in question shall be prohibited until one of the following occurs:	1926.1413(a)(4)(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:
(i) The employer complies with either 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, as specified in R 408.41019b.	1926.1413(a)(4)(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),
(ii) The wire rope is replaced, as specified in R 408.41019b.	1926.1413(a)(4)(B) The wire rope is replaced (see § 1926.1417), or
(iii) If the deficiency is localized, the problem shall corrected by severing the wire rope in 2. The undamaged portion may continue to be used. Joining lengths of wire rope by splicing shall be prohibited. If a rope is shortened under this subrule, the employer shall ensure that the drum will have 2 wraps of wire when the load, boom, or both is in the lowest position.	1926.1413(a)(4)(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 a deficiency in Category III is identified, operations involving use of the wire rope in question shall be prohibited until one of the following occurs:	1926.1413(a)(4)(iii) If a deficiency in Category III is identified, operations involving use of the wire rope in question must be prohibited until:
(i) The wire rope is replaced, as specified in R 408.41019b.	1926.1413(a)(4)(iii)(A) The wire rope is replaced (see § 1926.1417), or
(ii) If the deficiency, other than power line contact, is localized, the problem is corrected by severing the wire rope in 2. The undamaged portion may continue to be used. Joining lengths of wire rope by splicing shall be prohibited. Repair of wire rope that contacted an energized power line shall also be prohibited. If a rope is shortened under this subrule, the employer shall ensure that the drum will have 2 wraps of wire when the load, boom, or both is in the lowest position. The defective portion of a wire rope that is removed shall not be used for other load-carrying service.	1926.1413(a)(4)(iii)(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.
(d) Where a wire rope is required to be removed from service under this rule, either the equipment as a whole or the hoist with that wire rope shall be tagged-out, in accordance with R 408.41019b(5)(a), until the wire rope is repaired or replaced.	1926.1413(a)(4)(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.
(8) Monthly inspection.	1926.1413(b) Monthly inspection.
(a) Each month an inspection shall be conducted in accordance with subrule (1).	1926.1413(b)(1) Each month an inspection must be conducted in accordance with paragraph (a) (shift inspection) of this section.
(b) The inspection shall include any deficiencies that the qualified person who conducts the annual inspection determines under subrule (9)(c)(ii) shall be monitored.	1926.1413(b)(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.
(c) Wire ropes on equipment shall not be used until an inspection under this	1926.1413(b)(3) Wire ropes on equipment must not be used until an inspection

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
paragraph demonstrates that no corrective action under subrule (7) is required.	under this paragraph demonstrates that no corrective action under paragraph (a)(4) of this section is required.
(d) The inspection shall be documented according to R 408.41012a(6)(c).	1926.1413(b)(4) The inspection must be documented according to § 1926.1412(e)(3) (monthly inspection documentation).
(9) Annual.	1926.1413(c) Annual/comprehensive.
(a) At least every 12 months, wire ropes in use on equipment shall be inspected by a qualified person in accordance with subrule (1).	1926.1413(c)(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).
(b) In addition, at least every 12 months, the wire ropes in use on equipment shall be inspected by a qualified person, as follows:	1926.1413(c)(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 shall be for deficiencies of the types listed in subrule (3).	1926.1413(c)(2)(i) The inspection must 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 all of the following:	1926.1413(c)(2)(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 subrule (6).	1926.1413(c)(2)(ii)(A) Critical review items listed in paragraph (a)(3) of this section.
(B) Those sections that are normally hidden during shift and monthly inspections.	1926.1413(c)(2)(ii)(B) Those sections that are normally hidden during shift and monthly inspections.
(C) Wire rope subject to reverse bends.	1926.1413(c)(2)(ii)(C) Wire rope subject to reverse bends.
(D) Wire rope passing over sheaves.	1926.1413(c)(2)(ii)(D) Wire rope passing over sheaves.
(iii) Exception. In the event an inspection under subrule (9)(b) 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, these inspections shall be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and at the time of disassembly for standing ropes.	1926.1413(c)(2)(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.
(c) If a deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard.	1926.1413(c)(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.
(i) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until one of the following occurs:	1926.1413(c)(3)(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, as specified in R 408.41019b.	1926.1413(c)(3)(i)(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 2. The undamaged portion may continue to be used. Joining lengths of wire rope by splicing shall be prohibited. If a rope is shortened under this subrule, the employer shall ensure that the drum will have 2 wraps of wire when the load, boom, or both is in its lowest position.	1926.1413(c)(3)(i)(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 shall ensure that the deficiency is checked in the monthly inspections.	1926.1413(c)(3)(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.
(d) The inspection shall be documented according to R 408.41012a(7)(g).	1926.1413(c)(4) The inspection must be documented according to

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
	§ 1926.1412(f)(7) (annual/comprehensive inspection documentation).
(10) Rope lubricants that are of the type that hinder inspection shall not be used.	1926.1413(d) Rope lubricants that are of the type that hinder inspection must not be used.
(11) All documents produced under this rule shall be available, during the applicable document retention period, to all persons who conduct inspections under this rule.	1926.1413(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.
R 408.41014a Wire rope selection and installation criteria.	1926.1414 Wire rope—selection and installation criteria.
(1) Original equipment wire rope and replacement wire rope shall be selected and installed in accordance with the requirements of this rule. Selection of replacement wire rope shall be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.	1926.1414(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 rope must be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.
(2) Wire rope design criteria. Wire rope, other than rotation resistant rope, shall comply with either Option (1) or Option (2) of this subrule.	1926.1414(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:
(a) Option (1). Wire rope shall comply with section 5–1.7.1 of ANSI/ASME B30.5 “Mobile and Locomotive Cranes,” 2004 edition, which is adopted by reference in R 408.41003a, except that section 5-1.7.1 paragraph (c) shall not apply.	1926.1414(b)(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.
(b) Option (2). Wire rope shall 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 R 408.41013a will be an effective means of preventing sudden rope failure.	1926.1414(b)(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.
(3) Wire rope shall be compatible with the safe functioning of the equipment.	1926.1414(c) Wire rope must be compatible with the safe functioning of the equipment.
(4) Boom hoist reeving.	1926.1414(d) Boom hoist reeving.
(a) Fiber core ropes shall not be used for boom hoist reeving, except for derricks.	1926.1414(d)(1) Fiber core ropes must not be used for boom hoist reeving, except for derricks.
(b) Rotation resistant ropes shall be used for boom hoist reeving only where the requirements of subrule (5)(d)(ii) are met.	1926.1414(d)(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.
(5) Rotation resistant ropes.	1926.1414(e) Rotation resistant ropes.
(a) Definitions.	1926.1414(e)(1) Definitions.
(i) Type I rotation resistant wire rope (Type I) 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 2 operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	1926.1414(e)(1)(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.
(ii) Type II rotation resistant wire rope (Type II) is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of 2 or more layers of strands laid helically over a	1926.1414(e)(1)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
center in 2 or 3 operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	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) is stranded rope constructed to have limited resistance to rotation. It has no more than 9 outer strands, and comprises an assembly of 2 layers of strands laid helically over a center in 2 operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	1926.1414(e)(1)(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) Requirements.	1926.1414(e)(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.	1926.1414(e)(2)(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, shall have an operating design factor of not less than 3.5.	1926.1414(e)(2)(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 shall have an operating design factor of not less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing.	1926.1414(e)(2)(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 shall have an operating design factor of not less than 5, except where the requirements of subrule (5)(c) are met.	1926.1414(e)(2)(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.
(c) 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:	1926.1414(e)(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 shall inspect the rope in accordance with R 408.41013a(1). The rope shall be used only if the qualified person determines that there are no deficiencies constituting a hazard. In making this determination, more than 1 broken wire in any 1 rope lay shall be considered a hazard.	1926.1414(e)(3)(i) A qualified person must inspect the rope in accordance with § 1926.1413(a). The rope must be used 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.
(ii) Operations shall be conducted in a manner and at speeds so as to minimize dynamic effects.	1926.1414(e)(3)(ii) Operations must be conducted in such a manner and at such speeds as to minimize dynamic effects.
(iii) Each lift made under subrule (5)(c) shall be recorded in the monthly and annual inspection documents. Prior uses shall be considered by the qualified person in determining whether to use the rope again.	1926.1414(e)(3)(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.
(d) Additional requirements for rotation resistant ropes for boom hoist reeving.	1926.1414(e)(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 subrule (5)(d)(ii) are met.	1926.1414(e)(4)(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 shall be met:	1926.1414(e)(4)(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:

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(A) The drum shall provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used.	1926.1414(e)(4)(ii)(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 R 408.41024a(1), irrespective of the date of manufacture of the equipment, and R 408.41024a(2).	1926.1414(e)(4)(ii)(B) The requirements in § 1926.1426(a) (irrespective of the date of manufacture of the equipment), and § 1926.1426(b).
(C) The requirements in ANSI/ASME B30.5 "Mobile and Locomotive Cranes," 2004 edition, sections 5–1.3.2(a), (a)(2) through (a)(4), (b) and (d), which is adopted by reference in R 408.41003a, 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).	1926.1414(e)(4)(ii)(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 shall have a rope pitch diameter of not less than 18 times the nominal diameter of the rope used.	1926.1414(e)(4)(ii)(D) All sheaves used in the boom hoist reeving system must 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 5.	1926.1414(e)(4)(ii)(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 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.	1926.1414(e)(4)(ii)(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 shall be capable of handling rated capacities and speeds as specified by the manufacturer.	1926.1414(e)(4)(ii)(G) When provided, a power controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.
(6) 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 shall be permitted.	1926.1414(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.
(7) Socketing shall be done in the manner specified by the manufacturer of the wire rope or fitting.	1926.1414(g) Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting.
(8) 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.	1926.1414(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.
R 408.41015a Assembly or disassembly.	1926.1403 Assemble/Disassembly-selection of manufacturer or employer procedures
Rule 1015a. (1) When selecting manufacture or employer procedures for assembling or disassembling equipment or attachments, the employer shall comply with all applicable manufacturer prohibitions and shall comply with either of the following:	1926.1403 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.	1926.1403(a) Manufacturer procedures applicable to assembly and disassembly, or
(b) Employer procedures for assembly or disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in subrule (4). The employer shall follow	1926.1403(b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in § 1926.1406.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging, as specified in subrule (2)(r).	Note: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. (See § 1926.1404(r).)
(2) General requirements. These requirements shall apply to all assembly and disassembly operations.	1926.1404 Assembly/Disassembly--general requirements (applies to all assembly and disassembly operations).
(a) Supervision by a competent and qualified person.	1926.1404(a) Supervision--competent-qualified person.
(i) Assembly or disassembly shall be directed by a person who meets the criteria of an A/D director.	1926.1404(a)(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").
(ii) Where the assembly or disassembly is being performed by only one person, that person shall 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.	1926.1404(a)(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.
(b) Knowledge of procedures. The A/D director shall understand the applicable assembly or disassembly procedures.	1926.1404(b) Knowledge of procedures. The A/D director must understand the applicable assembly/disassembly procedures.
(c) Review of procedures. The A/D director shall review the applicable assembly or disassembly procedures immediately prior to the commencement of assembly or 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.	1926.1404(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).
(d) Crew instructions.	1926.1404(d) Crew instructions.
(i) Before commencing assembly or disassembly operations, the A/D director shall ensure that the crew members understand all of the following:	1926.1404(d)(1) Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all of the following:
(A) Their tasks.	1926.1404(d)(1)(i) Their tasks.
(B) The hazards associated with their tasks.	1926.1404(d)(1)(ii) The hazards associated with their tasks.
(C) The hazardous positions and locations that crew members need to avoid.	1926.1404(d)(1)(iii) The hazardous positions/locations that they need to avoid.
(ii) During assembly or disassembly operations, before a crew member takes on a different task, or when adding new personnel during the operations, the requirements in subrules (2)(d)(i)(A) to (2)(d)(i)(C) shall be met.	1926.1404(d)(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.
(e) Protecting assembly or disassembly crew members out of operator view.	1926.1404(e) Protecting assembly/disassembly crew members out of operator view.
(i) 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 or she is going to that location.	1926.1404(e)(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.
(ii) Where the operator knows that a crew member went to a location covered by subrule (2)(e)(i), the operator shall 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.	1926.1404(e)(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 pre-arranged system of communication that the crew

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
	member is in a safe position.
(f) Working under the boom, jib or other components.	1926.1404(f) Working under the boom, jib or other components.
(i) When pins or similar devices are being removed, employees shall not be under the boom, jib, or other components, except where the requirements of subrule (2)(f)(ii) are met.	1926.1404(f)(1) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of paragraph (f)(2) of this section are met.
(ii) Exception. 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, the A/D director shall 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 standard for an example.	1926.1404(f)(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.)
(g) Capacity limits. During all phases of assembly or 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 or disassembled.	1926.1404(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.
(h) Addressing specific hazards. The A/D director who supervises the assembly or disassembly operation shall address the hazards associated with the operation, which include all of the following:	1926.1404(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include:
(i) Site and ground bearing conditions. Site and ground conditions shall be adequate for safe assembly or disassembly operations and to support the equipment during assembly or disassembly, as specified in R 408.41017a.	1926.1404(h)(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).
(ii) Blocking material. The size, amount, condition and method of stacking the blocking shall be sufficient to sustain the loads and maintain stability.	1926.1404(h)(2) Blocking material. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability.
(iii) Proper location of blocking. When used to support lattice booms or components, blocking shall be appropriately placed to do both of the following:	1926.1404(h)(3) Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to:
(A) Protect the structural integrity of the equipment.	1926.1404(h)(3)(i) Protect the structural integrity of the equipment, and
(B) Prevent dangerous movement and collapse.	1926.1404(h)(3)(ii) Prevent dangerous movement and collapse.
(iv) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly or disassembly shall be verified in accordance with R 408.41019b(14)(c) before assembly or disassembly begins.	1926.1404(h)(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.
(v) Boom and jib pick points. The points of attachment of rigging to a boom, or boom sections or jib or jib sections, shall be suitable for preventing structural damage and facilitating safe handling of these components.	1926.1404(h)(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.
(vi) Center of gravity.	1926.1404(h)(6) Center of gravity.
(A) The center of gravity of the load shall be identified if that is necessary for the method used for maintaining stability.	1926.1404(h)(6)(i) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability.
(B) When 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 shall be used.	1926.1404(h)(6)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
See Non-mandatory Appendix B of this standard for an example.	must be used. (See Non-mandatory Appendix B of this subpart for an example.)
(vii) Stability upon pin removal. The boom sections, boom suspension systems, such as gantry A-frames and jib struts, and components shall be rigged or supported to maintain stability upon the removal of the pins.	1926.1404(h)(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.
(viii) Snagging. Suspension ropes and pendants shall not be allowed to catch on the boom or jib connection pins or cotter pins, including keepers and locking pins.	1926.1404(h)(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).
(ix) Struck by counterweights. Address potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.	1926.1404(h)(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting counterweights.
(x) Boom hoist brake failure. Each time reliance is to be placed on the boom hoist brake to prevent boom movement during assembly or disassembly, the brake shall 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 or 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.	1926.1404(h)(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.
(xi) Loss of backward stability. Address backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.	1926.1404(h)(11) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.
(xii) Wind speed and weather. Address the effect of wind speed and weather on the equipment.	1926.1404(h)(12) Wind speed and weather. The effect of wind speed and weather on the equipment.
(i) [Reserved.]	1926.1404(i) [Reserved.]
(j) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering shall not be exceeded. When these are unavailable, a registered professional engineer familiar with the type of equipment involved shall determine in writing this limitation, which shall not be exceeded.	1926.1404(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.
(k) Weight of components. The weight of each of the components shall be readily available.	1926.1404(k) Weight of components. The weight of each of the components must be readily available.
(l) [Reserved.]	1926.1404(l) [Reserved.]
(m) Components and configuration.	1926.1404(m) Components and configuration.
(i) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment shall be in accordance with one of the following:	1926.1404(m)(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:
(A) Manufacturer instructions, prohibitions, limitations, and specifications. When these are unavailable, a registered professional engineer familiar with the type of equipment involved shall approve, in writing, the selection and configuration of components.	1926.1404(m)(1)(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
(B) Approved modifications that meet the requirements of R 408.41028a.	1926.1404(m)(1)(ii) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications).
(ii) Post-assembly inspection. Upon completion of assembly, the equipment	1926.1404(m)(2) Post-assembly inspection. Upon completion of assembly, the

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
shall be inspected to ensure compliance with subrule (2)(m)(i) as specified in R 408.41012a(4).	equipment must be inspected to ensure compliance with paragraph (m)(1) of this section (see § 1926.1412(c) for post-assembly inspection requirements).
(n) [Reserved.]	1926.1404(n) [Reserved.]
(o) Shipping pins. Reusable shipping pins, straps, links, and similar equipment shall be removed. After they are removed, they shall either be stowed or otherwise stored so that they do not present a falling object hazard.	1926.1404(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.
(p) Pile driving. Equipment used for pile driving shall not have a jib attached during pile driving operations.	1926.1404(p) Pile driving. Equipment used for pile driving must not have a jib attached during pile driving operations.
(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 shall be met, except as otherwise indicated:	1926.1404(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 (except as otherwise indicated):
(i) The outriggers or stabilizers shall be either fully extended or, if the manufacturer's procedures permit, deployed as specified in the load chart.	1926.1404(q)(1) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.
(ii) The outriggers shall be set to remove the equipment weight from the wheels, except for locomotive cranes. For use of outriggers on locomotive cranes see subrule (q)(vi). This provision does not apply to stabilizers.	1926.1404(q)(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.
(iii) When outrigger floats are used, they shall be attached to the outriggers. When stabilizer floats are used, they shall be attached to the stabilizers.	1926.1404(q)(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.
(iv) Each outrigger or stabilizer shall be visible to the operator or to a signal person during extension and setting.	1926.1404(q)(4) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.
(v) Outrigger and stabilizer blocking shall comply with both of the following:	1926.1404(q)(5) Outrigger and stabilizer blocking must:
(A) Meet the requirements in subrule (h)(ii) and (h)(iii).	1926.1404(q)(5)(i) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section.
(B) Be placed only under the outrigger or stabilizer float or 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.	1926.1404(q)(5)(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.
(vi) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures shall be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures shall be met regarding truck wedges or screws.	1926.1404(q)(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.
(r) Rigging. In addition to following the requirements in construction safety standard Part 8 "Handling and Storage of Materials," as referenced in R 408.41003a, and other requirements in this and other standards applicable to rigging, when rigging is used for assembly or disassembly, the employer shall ensure all of the following:	1926.1404(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:
(i) The rigging work is done by a qualified rigger.	1926.1404(r)(1) The rigging work is done by a qualified rigger.
(ii) 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. Requirements for the protection of wire rope slings are contained in construction safety standard Part 8 "Handling and	1926.1404(r)(2) 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. Note: Requirements for the protection of wire rope slings are contained in 29 CFR 1926.251(c)(9).

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
Storage of Materials," as referenced in R 408.41003a.	
(iii) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations shall be followed.	1926.1404(r)(3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.
(3) 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 shall comply with all of the following:	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 shall be removed, either partly or completely, when the pendants are in tension.	1926.1405(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.
(b) None of the pins at the top or bottom of the boom sections located between the pendant attachment points and the crane or derrick body shall be removed, either partly or completely, when the pendants are in tension.	1926.1405(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.
(c) None of the pins at the top or bottom on boom sections located between the uppermost boom section and the crane or derrick body shall be removed, either partly or completely, when the boom is being supported by the uppermost boom section resting on the ground or other support.	1926.1405(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).
(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed, for example the portion being removed ahead of the pendant attachment points, shall not be removed, either partly or completely, until the cantilevered section to be removed is fully supported.	1926.1405(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.
(4) Assembly or disassembly—employer procedures—general requirements.	1926.1406 Assembly/Disassembly--employer procedures--general requirements.
(a) When using employer procedures instead of manufacturer procedures for assembly or disassembly, the employer procedures shall ensure all of the following:	1926.1406(a) When using employer procedures instead of manufacturer procedures for assembly/disassembly, the employer must ensure that the procedures:
(i) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment.	1926.1406(a)(1) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment.
(ii) Provide adequate support and stability of all parts of the equipment.	1926.1406(a)(2) Provide adequate support and stability of all parts of the equipment.
(iii) Position employees involved in the assembly or disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized.	1926.1406(a)(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.
(b) Qualified person. Employer procedures shall be developed by a qualified person.	1926.1406(b) Qualified person. Employer procedures must be developed by a qualified person.
R 408.41016a Power line safety up to 350 kV; assembly and disassembly.	1926.1407 Power line safety (up to 350 kV)--assembly and disassembly.
Rule 1016a. (1) Before assembling or disassembling equipment, the employer shall determine if any part of the equipment, load line, or load, including rigging and lifting accessories, could get closer than 20 feet to a power line during the assembly or disassembly process. If this could occur, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this subrule, as follows:	1926.1407(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:

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(a) Option (1)—Deenergize and ground. Confirm from the utility owner or operator that the power line has been deenergized and visibly grounded at the worksite. Employers choosing this option shall not proceed with this option if the electric utility does not deenergize the power line. This standard does not require utility companies to deenergize power lines.	1926.1407(a)(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.
(b) 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 subrule (2).	1926.1407(a)(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.
(c) Option (3)—Table A clearance.	1926.1407(a)(3) Option (3)--Table A clearance.
(i) Determine the line's voltage and the minimum clearance distance permitted under Table A, as specified in R 408.41016b.	1926.1407(a)(3)(i) Determine the line's voltage and the minimum clearance 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, as specified in R 408.41016b. If this could occur, then the employer shall follow the requirements in subrule (2) 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.	1926.1407(a)(3)(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.
(2) Preventing encroachment and electrocution. When encroachment precautions are required under Option (2) or Option (3) of this rule, all of the following requirements shall be met:	1926.1407(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:
(a) Conduct a planning meeting with the A/D director, operator, assembly or disassembly crew and the other workers who will be in the assembly or disassembly area to review the location of the power lines and the steps that will be implemented to prevent encroachment and electrocution.	1926.1407(b)(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.
(b) If tag lines are used, they shall be nonconductive.	1926.1407(b)(2) If tag lines are used, they must be nonconductive.
(c) At least one of the following additional measures shall be in place. The measure selected shall be effective in preventing encroachment.	1926.1407(b)(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 shall comply with all the following:	1926.1407(b)(3)(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:	1926.1407(b)(3)(i)(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).
(I) A clearly visible line painted on the ground. (II) A clearly visible line of stanchions. (III) 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.	1926.1407(b)(3)(i)(B) Be positioned to effectively gauge the clearance distance.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.	1926.1407(b)(3)(i)(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.	1926.1407(b)(3)(i)(D) Give timely information to the operator so that the required clearance distance can be maintained.
(ii) Use a proximity alarm set to give the operator sufficient warning to prevent encroachment.	1926.1407(b)(3)(ii) A proximity alarm set to give the operator sufficient warning to prevent encroachment.
(iii) Use a device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device shall be set to give the operator sufficient warning to prevent encroachment.	1926.1407(b)(3)(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) Use a device that automatically limits range of movement and that is set to prevent encroachment.	1926.1407(b)(3)(iv) A device that automatically limits range of movement, set to prevent encroachment.
(v) Use an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	1926.1407(b)(3)(v) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.
(3) Assembly or disassembly below power lines shall be prohibited. No part of a crane or 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 or operator has deenergized and visibly grounded the power line at the worksite.	1926.1407(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.
(4) Assembly or disassembly inside Table A clearance shall be prohibited. No part of a crane or derrick, load line, or load, including rigging and lifting accessories, whether partially or fully assembled, shall be closer than the minimum approach distance under Table A, as specified in R 408.41016b, to a power line unless the employer has confirmed that the utility owner or operator has deenergized and visibly grounded the power line at the worksite.	1926.1407(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 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.
(5) Voltage information. When Option (3) of this rule is used, the utility owner or operator of the power lines shall provide the requested voltage information within two working days of the employer's request.	1926.1407(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.
(6) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner or operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	1926.1407(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.
(7) Posting of electrocution warnings. At least one electrocution hazard warning shall be 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.	1926.1407(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.
R 408.41016b Power line safety up to 350 kV; equipment operations.	1926.1408 Power line safety (up to 350 kV)--equipment operations.
Rule 1016b (1) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer shall do both of the following:	1926.1408(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer must:
(a) Identify the work zone by either of the following means:	1926.1408(a)(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	1926.1408(a)(1)(i) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
operating the equipment past those boundaries.	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 radius.	1926.1408(a)(1)(ii) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.
(b) 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 this could occur, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this rule.	1926.1408(a)(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 or operator that the power line has been deenergized and visibly grounded at the worksite.	1926.1408(a)(2)(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 subrule (2).	1926.1408(a)(2)(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.	1926.1408(a)(2)(iii) Option (3)--Table A clearance.
(A) Determine the line's voltage and the minimum approach distance permitted under Table A of this rule.	1926.1408(a)(2)(iii)(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. If this could occur, the employer shall follow the requirements in subrule (2) 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.	1926.1408(a)(2)(iii)(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.
(2) Preventing encroachment or electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this rule, all of the following requirements shall be met:	1926.1408(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:
(a) 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 lines, and the steps that shall be implemented to prevent encroachment or electrocution.	1926.1408(b)(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.
(b) If tag lines are used, they shall be nonconductive.	1926.1408(b)(2) If tag lines are used, they must be non-conductive.
(c) 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 rule, or at the minimum approach distance under Table A, if using Option (3) of this rule. If the operator is unable to see the elevated warning line, a dedicated spotter shall be used as described in subrule (1)(d)(ii) in addition to implementing one of the measures described in subrule (1)(d)(i), (iii), (iv) and (v).	1926.1408(b)(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).
(d) Implement at least one of the following measures:	1926.1408(b)(4) Implement at least one of the following measures:

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(i) Set a proximity alarm to give the operator sufficient warning to prevent encroachment.	1926.1408(b)(4)(i) A proximity alarm set to give the operator sufficient warning to prevent encroachment.
(ii) Use a dedicated spotter as specified in R 408.41016a(2)(c)(i).	1926.1408(b)(4)(ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: 1926.1408(b)(4)(ii)(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). 1926.1408(b)(4)(ii)(B) Be positioned to effectively gauge the clearance distance. 1926.1408(b)(4)(ii)(C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. 1926.1408(b)(4)(ii)(D) Give timely information to the operator so that the required clearance distance can be maintained.
(iii) Use a device that automatically warns the operator when to stop movement, such as a range control warning device. This device shall be set to give the operator sufficient warning to prevent encroachment.	1926.1408(b)(4)(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) Use of a device that automatically limits range of movement shall be set to prevent encroachment.	1926.1408(b)(4)(iv) A device that automatically limits range of movement, set to prevent encroachment.
(v) Use of an insulating link or device, as defined in R 408.41004a, shall be installed at a point between the end of the load line, or below, and the load.	1926.1408(b)(4)(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.
(e) The requirements of subrule (2)(d) do not apply to work covered by construction safety standard Part 16 “Power Transmission and Distribution,” as referenced in R 408.41003a.	1926.1408(b)(5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.
(3) Voltage information. When Option (3) of this rule is used, the utility owner or operator of the power lines shall provide the requested voltage information within 2 working days of the employer’s request. See Appendix D.	1926.1408(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.
(4) Operations below power lines.	1926.1408(d) Operations below power lines.
(a) 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 or operator has deenergized and visibly grounded the power line at the worksite.	1926.1408(d)(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.
(b) Exceptions. Subrule (4)(a) shall be inapplicable when the employer demonstrates that one of the following applies:	1926.1408(d)(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 construction safety standard Part 16 “Power Transmission and Distribution,” as referenced in R 408.41003a.	1926.1408(d)(2)(i) The work is covered by subpart V of this part.
(ii) For equipment with nonextensible booms, the 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 rule minimum	1926.1408(d)(2)(ii) For equipment with non-extensible booms: The 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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
clearance distance below the plane of the power line.	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 rule minimum clearance distance below the plane of the power line.	1926.1408(d)(2)(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 is infeasible and meets the requirements of R 408.41016d.	1926.1408(d)(2)(iv) The employer demonstrates that compliance with paragraph (d)(1) of this section is infeasible and meets the requirements of § 1926.1410.
(5) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner or operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	1926.1408(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.
(6) When working near transmitter or 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 both of the following precautions shall be taken:	1926.1408(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:
(a) The equipment shall be provided with an electrical ground.	1926.1408(f)(1) The equipment must be provided with an electrical ground.
(b) If tag lines are used, they shall be non-conductive.	1926.1408(f)(2) If tag lines are used, they must be non-conductive.
(7) Training.	1926.1408(g) Training.
(a) The employer shall train each operator and crew member assigned to work with the equipment on all of the following:	1926.1408(g)(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, including all of the following:	1926.1408(g)(1)(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.	1926.1408(g)(1)(i)(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.	1926.1408(g)(1)(i)(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.	1926.1408(g)(1)(i)(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.	1926.1408(g)(1)(i)(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.	1926.1408(g)(1)(i)(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.	1926.1408(g)(1)(i)(F) Safe clearance distance from power lines.
(ii) Power lines are presumed to be energized unless the utility owner or operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	1926.1408(g)(1)(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 or operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.	1926.1408(g)(1)(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 insulated.

<table>
<tr><th>CS Part 10 Lifting and Digging Equipment</th><th>OSHA 1926.14 Cranes and Derricks in Construction</th></tr>
<tr><td>(iv) The limitations of an insulating link or device, proximity alarm, and any range control devices, if used.</td><td>1926.1408(g)(1)(iv) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used.</td></tr>
<tr><td>(v) The procedures to be followed to properly ground equipment and the limitations of grounding.</td><td>1926.1408(g)(1)(v) The procedures to be followed to properly ground equipment and the limitations of grounding.</td></tr>
<tr><td>(b) Employees working as dedicated spotters shall be trained to enable them to effectively perform their task, including training on the applicable requirements of this rule.</td><td>1926.1408(g)(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.</td></tr>
<tr><td>(c) Training under this rule shall be administered in accordance with R 408.41009a(g).</td><td>1926.1408(g)(3) Training under this section must be administered in accordance with § 1926.1430(g).</td></tr>
<tr><td>(8) Devices originally designed by the manufacturer for use as a safety device, as specified in R 408.41018a, operational aid, or a means to prevent power line contact or electrocution, when used to comply with this rule, shall meet the manufacturer’s procedures for use and conditions of use.</td><td>1926.1408(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.</td></tr>
<tr><td>
<table>
<tr><th colspan="2">TABLE A—MINIMUM CLEARANCE DISTANCES</th></tr>
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<tr><td>over 50 to 200</td><td>15</td></tr>
<tr><td>over 200 to 350</td><td>20</td></tr>
<tr><td>over 350 to 500</td><td>25</td></tr>
<tr><td>over 500 to 750</td><td>35</td></tr>
<tr><td>over 750 to 1,000</td><td>45</td></tr>
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</td></tr>
<tr><td></td><td></td></tr>
<tr><td>R 408.41016c Power line safety over 350 kV.</td><td>1926.1409 Power line safety (over 350 kV).</td></tr>
<tr><td>Rule 1016c The requirements of R 408.41016a and R 408.41016b shall</td><td>1926.1409 The requirements of § 1926.1407 and § 1926.1408 apply to power</td></tr>
</table>

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
apply to power lines over 350 kV except:	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’’ shall be substituted.	1926.1409(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 shall be established by the utility owner or operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.	1926.1409(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.
R 408.41016d Power line safety for all voltages for equipment operations closer than the Table A zone.	1926.1410 Power line safety (all voltages)--equipment operations closer than the Table A zone.
Rule 1016d. 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 in R 408.41016b to an energized power line shall be prohibited, except where the employer demonstrates that all of the following requirements are met:	1926.1410 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:
(a) The employer determines that it is infeasible to do the work without breaching the minimum approach distance under Table A in R 408.41016b.	1926.1410(a) The employer determines that it is infeasible to do the work without breaching the minimum approach distance under Table A of § 1926.1408.
(b) The employer determines that, after consultation with the utility owner or operator, it is infeasible to deenergize and ground the power line or relocate the power line.	1926.1410(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.	1926.1410(c) Minimum clearance distance.
(i) The power line owner or operator or registered professional engineer, who is a qualified person with respect to electrical power transmission and distribution, determines the minimum clearance distance that shall be maintained to prevent electrical contact in light of the on-site conditions. The factors that shall be considered in making this determination include, but are not limited to: (A) Conditions affecting atmospheric conductivity. (B) Time necessary to bring the equipment, load line, and load, including rigging and lifting accessories, to a complete stop. (C) Wind conditions. (D) Degree of sway in the power line. (E) Lighting conditions. (F) Other conditions affecting the ability to prevent electrical contact.	1926.1410(c)(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.
(ii) Subrule (c)(i) does not apply to work covered by construction safety standard Part 16 “Power Transmission and Distribution,” (CS Part 16) as referenced in R 408.41003a. For such work, the minimum clearance distances specified in CS Part 16 Table 1 shall apply. Employers engaged in CS Part 16 work are permitted to work closer than the distances in CS Part 16 Table 1 where both the requirements of this rule and CS Part 16 R 408.41642(2) are met.	1926.1410(c)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(d) A planning meeting with the employer and utility owner or 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 all of the following:	1926.1410(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:
(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 shall be made inoperative if the design of the device permits.	1926.1410(d)(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.
(ii) Use a dedicated spotter as specified in R 408.41016a(2)(c)(i).	1926.1410(d)(2) A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must: 1926.1410(d)(2)(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). 1926.1410(d)(2)(ii) Be positioned to effectively gauge the clearance distance. 1926.1410(d)(2)(iii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. 1926.1410(d)(2)(iv) Give timely information to the operator so that the required clearance distance can be maintained.
(iii) Use of an elevated warning line or barricade that is not attached to the crane in view of the operator, either directly or through video equipment, and equipped with flags or similar high-visibility markings to prevent electrical contact. This provision does not apply to work covered by construction safety standard Part 16 “Power Transmission and Distribution,” as referenced in R 408.41003a.	1926.1410(d)(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.
(iv) Use of an insulating link or device.	1926.1410(d)(4) Insulating link/device.
(A) An insulating link or device shall be installed at a point between the end of the load line, or below, and the load.	1926.1410(d)(4)(i) 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 construction safety standard Part 16 “Power Transmission and Distribution,” (CS Part 16) as referenced in R 408.41003a, the requirement in subrule (d)(iv)(A) shall apply only when working inside the CS Part 16 Table 1 clearance distances.	1926.1410(d)(4)(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.
(C) For work covered by construction safety standard Part 16 “Power Transmission and Distribution”, as referenced in R 408.41003a, involving operations where use of an insulating link or device is infeasible, the requirements of general industry safety standard Part 86 “Electric Power Generation, Transmission, and Distribution,” 1910.269(p)(4)(iii)(B) or (C), as	1926.1410(d)(4)(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 this section.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
referenced in R 408.41003a, may be substituted for the requirement in subrule (A).	
RULE WILL BECOME EFFECTIVE AFTER NOVEMBER 8, 2011	1926.1410(d)(4)(iv) Until November 8, 2011, 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.
(D) Until November 8, 2013, the following procedure may be substituted for the requirement in subrule (A):	1926.1410(d)(4)(v) Until November 8, 2013, the following procedure may be substituted for the requirement in (d)(4)(i) of this section:
(I) The employer shall use a link or device manufactured on or before November 8, 2011 that meets the definition of an insulating link or device, except that it has not been approved by a nationally recognized testing laboratory, and is maintained, used, and installed in accordance with manufacturer requirements and recommendations at a point between the end of the load line, or below, and the load.	1926.1410(d)(4)(v)(A) The employer must use a link/device manufactured on or before November 8, 2011, 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
(II) All employees, excluding equipment operators located on the equipment, who may come in contact with the equipment, the load line, or the load shall be insulated or guarded from the equipment, the load line, and the load through an additional means other than the device described in subrule (d)(iv)(D)(I). Insulating gloves rated for the voltage involved are adequate additional means of protection for the purposes of this subrule.	1926.1410(d)(4)(v)(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.
(v) Use of nonconductive rigging if the rigging may be within the minimum clearance distances during operation, as specified in Table A in R 408.41016b.	1926.1410(d)(5) Nonconductive rigging if the rigging may be within the Table A of § 1926.1408 distance during the operation.
(vi) If the equipment is equipped with a device that automatically limits range of movement, it shall 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 subrule (c).	1926.1410(d)(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.
(vii) If a tag line is used, it shall be of the nonconductive type.	1926.1410(d)(7) If a tag line is used, it must be of the nonconductive type.
(viii) Use of 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.	1926.1410(d)(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.
(ix) Workers other than the operator shall be prohibited from touching the load line above the insulating link or device and crane. Operators who remotely operate the equipment from the ground shall use either wireless controls that isolate the operator from the equipment or insulating mats that insulate the operator from the ground.	1926.1410(d)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(x) Only personnel essential to the operation shall be permitted to be in the area of the crane and load.	1926.1410(d)(10) Only personnel essential to the operation are permitted to be in the area of the crane and load.
(xi) The equipment shall be properly grounded.	1926.1410(d)(11) The equipment must be properly grounded.
(xii) Insulating line hose or cover-up shall be installed by the utility owner or operator except where such devices are unavailable for the line voltages involved.	1926.1410(d)(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.
(e) The procedures developed to comply with subrule (d) of this rule are documented and immediately available on-site.	1926.1410(e) The procedures developed to comply with paragraph (d) of this section are documented and immediately available on-site.
(f) The equipment user and utility owner or operator, or registered professional engineer shall meet with the equipment 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 subrule (c) of this rule and prevent electrocution.	1926.1410(f) The equipment user and utility owner/operator (or registered professional engineer) meet with the equipment 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.
(g) The procedures developed to comply with subrule (d) of this rule are implemented.	1926.1410(g) The procedures developed to comply with paragraph (d) of this section are implemented.
(h) The utility owner or operator, or registered professional engineer 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 subrule shall direct the implementation of the procedures and shall have the authority to stop work at any time to ensure safety.	1926.1410(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.]	1926.1410(i) [Reserved.]
(j) If a problem occurs implementing the procedures being used to comply with subrule (d), or indicating that those procedures are inadequate to prevent electrocution, the employer shall safely stop operations and either develop new procedures to comply with subrule (d) or have the utility owner or operator deenergize and visibly ground or relocate the power line before resuming work.	1926.1410(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.
(k) Devices originally designed by the manufacturer for use as a safety device, as specified in R 408.41018a, operational aid, or a means to prevent power line contact or electrocution, when used to comply with this rule, shall comply with the manufacturer’s procedures for use and conditions of use.	1926.1410(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.
(l) [Reserved.]	1926.1410(l) [Reserved.]
(m) The employer shall train each operator and crew member assigned to work with the equipment in accordance with R 408.41016b(7).	1926.1410(m) The employer must train each operator and crew member assigned to work with the equipment in accordance with § 1926.1408(g).
R 408.41016e Power line safety while traveling under or near power lines with no load.	1926.1411 Power line safety--while traveling under or near power lines with no load.
Rule 1016e (1) This rule establishes procedures and criteria that shall be met for equipment traveling under or near a power line on a construction site	1926.1411(a) This section establishes procedures and criteria that must be met for equipment traveling under or near a power line on a construction site

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
with no load. Equipment traveling on a construction site with a load shall comply with R 408.41016b, R 408.41016c, or R 408.41016d, whichever is appropriate, and R 408.41019b(19).	with no load. Equipment traveling on a construction site with a load is governed by §§ 1926.1408, 1926.1409 or 1926.1411, whichever is appropriate, and § 1926.1417(u).
(2) The employer shall ensure that all of the following are met:	1926.1411(b) The employer must ensure that:
(a) The boom or mast and boom or mast support system are lowered sufficiently to meet the requirements of this rule.	1926.1411(b)(1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph.
(b) The clearances specified in Table T of this rule are maintained.	1926.1411(b)(2) The clearances specified in Table T of this section are maintained.
(c) The effects of speed and terrain on equipment movement, including movement of the boom or mast, are considered so that those effects do not cause the minimum clearance distances specified in Table T of this rule to be breached.	1926.1411(b)(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.
(d) 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 driver or operator is used. The dedicated spotter shall do all of the following:	1926.1411(b)(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.	1926.1411(b)(4)(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.	1926.1411(b)(4)(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.	1926.1411(b)(4)(iii) Give timely information to the operator so that the required clearance distance can be maintained.
(e) Additional precautions for traveling in poor visibility. When traveling at night or in conditions of poor visibility, in addition to the measures specified in subrule (a) to (d), the employer shall ensure that:	1926.1411(b)(5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, 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.	1926.1411(b)(5)(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.	1926.1411(b)(5)(ii) A safe path of travel is identified and used.
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	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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
Over 1,000 (as established by the utility owner or operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).	electrical power transmission and distribution).
R 408.41017a Ground conditions.	1926.1402 Ground conditions.
Rule 1017a. (1) The equipment shall not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction with the use of supporting materials if necessary, 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 or wetlands.	1926.1402(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.
(2) The controlling entity shall do both of the following:	1926.1402(c) The controlling entity must:
(a) Ensure that ground preparations necessary to meet the requirements in subrule (1) are provided.	1926.1402(c)(1) Ensure that ground preparations necessary to meet the requirements in paragraph (b) of this section are provided.
(b) Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area, such as voids, tanks, and 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.	1926.1402(c)(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.
(3) If there is no controlling entity for the project, the requirement in subrule (2)(a) shall be met by the employer who has authority at the site to make or arrange for ground preparations needed to meet subrule (1).	1926.1402(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.
(4) If the A/D director or the operator determines that ground conditions do not meet the requirements in subrule (1), that person's employer shall have a discussion with the controlling entity regarding the ground preparations that are needed so that the requirements in subrule (1) can be met with the use of suitable supporting materials or devices, if necessary.	1926.1402(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.
(5) This rule 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.	1926.1402(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.
R 408.41018a Safety devices.	1926.1415 Safety devices.
Rule 1018a. (1) The following safety devices shall be required on all equipment covered by this part, unless otherwise specified:	1926.1415(a) Safety devices. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified:
(a) Crane level indicator.	1926.1415(a)(1) Crane level indicator.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(i) The equipment shall have a crane level indicator that is either built into the equipment or is available on the equipment.	1926.1415(a)(1)(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 shall be tagged-out or removed. If a removable crane level indicator is not working properly, it shall be removed.	1926.1415(a)(1)(ii) If a built-in crane level indicator is not working 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 shall not apply to portal cranes, derricks, floating cranes or derricks and land cranes or derricks on barges, pontoons, vessels or other means of flotation.	1926.1415(a)(1)(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.	1926.1415(a)(2) Boom stops, except for derricks and hydraulic booms.
(c) Jib stops, if a jib is attached, except for derricks.	1926.1415(a)(3) Jib stops (if a jib is attached), except for derricks.
(d) Equipment with foot pedal brakes shall have locks.	1926.1415(a)(4) Equipment with foot pedal brakes must have locks.
(e) Hydraulic outrigger jacks and hydraulic stabilizer jacks shall have an integral holding device or check valve.	1926.1415(a)(5) Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve.
(f) Equipment on rails shall have rail clamps and rail stops, except for portal cranes.	1926.1415(a)(6) Equipment on rails must have rail clamps and rail stops, except for portal cranes.
(g) Horn.	1926.1415(a)(7) Horn
(i) The equipment shall have a horn that is either built into the equipment or is on the equipment and immediately available to the operator.	1926.1415(a)(7)(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 shall be tagged-out or removed. If a removable horn is not working properly, it shall be removed.	1926.1415(a)(7)(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.
(2) Proper operation required. Operations shall not begin unless all of the devices listed in subrule (1) are in proper working order. If a device stops working properly during operations, the operator shall safely stop operations. If any of the devices listed in subrule (1) are not in proper working order, the equipment shall be taken out of service and operations shall not resume until the device is again working properly as specified in R 408.41019b. Alternative measures shall not be used.	1926.1415(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.
R 408.41019a Operational aids.	1926.1416 Operational aids.
Rule 1019a. (1) The devices listed in this rule are required on all equipment covered by this part, unless otherwise specified.	1926.1416(a) The devices listed in this section ("listed operational aids") are required on all equipment covered by this subpart, unless otherwise specified.
(a) The requirements in subrules (5)(a), (5)(b), and (5)(c) do not apply to articulating cranes.	1926.1416(a)(1) The requirements in paragraphs (e)(1), (e)(2), and (e)(3) of this section do not apply to articulating cranes.
(b) The requirements in subrules (4)(c), (5)(a), and (5)(d) apply only to those digger derricks manufactured after November 8, 2011.	1926.1416(a)(2) The requirements in paragraphs (d)(3), (e)(1), and (e)(4) of this section apply only to those digger derricks manufactured after November 8, 2011.
(2) Operations shall not begin unless the listed operational aids are in proper working order, except when an operational aid is being repaired the employer shall use the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in subrules (4) and (5). More protective alternative measures specified by the crane or derrick manufacturer, if any, shall be followed.	1926.1416(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(3) 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 shall be permitted and shall not be considered a modification under R 408.41028a.	1926.1416(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.
(4) Category I operational aids and alternative measures. Operational aids listed in this subrule that are not working properly shall 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 shall be completed within 7 calendar days of receipt of the parts. See R 408.41019b(9) for additional requirements.	1926.1416(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 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.
(a) Boom hoist limiting device.	1926.1416(d)(1) Boom hoist limiting device.
(i) For equipment manufactured after December 16, 1969, a boom hoist limiting device shall be required. If temporary alternative measures are necessary, one or more of the following methods shall be used:	1926.1416(d)(1)(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.	1926.1416(d)(1)(i)(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 shall 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.	1926.1416(d)(1)(i)(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 shall 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.	1926.1416(d)(1)(i)(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 subrule (4)(a)(i)(A) to (4)(a)(i)(C) shall be used.	1926.1416(d)(1)(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.
(b) Luffing jib limiting device. Equipment with a luffing jib shall have a luffing jib limiting device. Temporary alternative measures shall be the same as in subrule (4)(a)(i), except to limit the movement of the luffing jib rather than the boom hoist.	1926.1416(d)(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.
(c) Anti two-blocking device.	1926.1416(d)(3) Anti two-blocking device.
(i) Telescopic boom cranes manufactured after February 28, 1992 shall 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 shall prevent this 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 shall give the operator sufficient time to stop the hoist to prevent	1926.1416(d)(3)(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. 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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
two-blocking, and use a spotter when extending the boom.	stop the hoist to prevent two-blocking, and use a spotter when extending the boom.
(ii) Lattice boom cranes.	1926.1416(d)(3)(ii) Lattice boom cranes.
(A) Lattice boom cranes manufactured after February 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 shall either prevent this damage or failure, or provide adequate warning for all points where two-blocking may occur.	1926.1416(d)(3)(ii)(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 November 8, 2011 shall be equipped with a device that 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 shall prevent this damage or failure at all points where two-blocking may occur.	1926.1416(d)(3)(ii)(B) Lattice boom cranes and derricks manufactured after November 8, 2011 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 subrules (4)(c)(ii)(A) and (4)(c)(ii)(B) shall not apply to lattice boom equipment when used for dragline, clamshell or grapple, magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel and pile driving work.	1926.1416(d)(3)(ii)(C) Exception. The requirements in paragraphs (d)(3)(ii)(A) 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 shall give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter.	1926.1416(d)(3)(ii)(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.
(iii) Articulating cranes manufactured after December 31, 1999 that are equipped with a load hoist shall 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 shall prevent this damage at all points where two-blocking may occur. Temporary alternative measures: When two-blocking may 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 shall give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. When two-blocking may 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.	1926.1416(d)(3)(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.
(5) Category II operational aids and alternative measures. Operational aids listed in this subrule that are not working properly shall 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	1926.1416(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 part is not received

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
complete the repair in 30 calendar days, the repair shall be completed within 7 calendar days of receipt of the parts. See R 408.41019b(9) for additional requirements.	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.
(a) 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.	1926.1416(e)(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.
(b) 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.	1926.1416(e)(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.
(c) 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 shall be used:	1926.1416(e)(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.	1926.1416(e)(3)(i) Mark the boom with measured marks to calculate boom length,
(ii) Calculate boom length from boom angle and radius measurements.	1926.1416(e)(3)(ii) Calculate boom length from boom angle and radius measurements,
(iii) Measure the boom with a measuring device.	1926.1416(e)(3)(iii) Measure the boom with a measuring device.
(d) Load weighing and similar devices.	1926.1416(e)(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 shall have at least one of the following: a load weighing device, a load moment or rated capacity indicator, or a load moment or rated capacity limiter. Temporary alternative measures: The weight of the load shall 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 shall be provided to the operator prior to the lift.	1926.1416(e)(4)(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 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 November 8, 2011 shall have at least one of the following: an automatic overload prevention device, a load weighing device, a load moment or rated capacity indicator, or a load moment rated capacity limiter. Temporary alternative measures: The weight of the load shall 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 shall be provided to the operator prior to the lift.	1926.1416(e)(4)(ii) Articulating cranes manufactured after November 8, 2011 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.
(e) Both of the following devices shall be required on equipment manufactured after November 8, 2011:	1926.1416(e)(5) The following devices are required on equipment manufactured after November 8, 2011:
(i) Outrigger or stabilizer position, horizontal beam extension, sensor or monitor if the equipment has outriggers or stabilizers. Temporary alternative	1926.1416(e)(5)(i) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. Temporary

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
measures: The operator shall verify that the position of the outriggers or stabilizers is correct in accordance with manufacturer procedures before beginning operations requiring outrigger or stabilizer deployment.	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 the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.	1926.1416(e)(5)(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 the rotation of the drum. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark.
R 408.41019b Operations.	1926.1417 Operation.
Rule 1019b. (1) The employer shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	1926.1417(a) The employer must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.
(2) Unavailable operation procedures.	1926.1417(b) Unavailable operation procedures.
(a) When 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.	1926.1417(b)(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.
(b) Procedures for the operational controls shall be developed by a qualified person.	1926.1417(b)(2) Procedures for the operational controls must be developed by a qualified person.
(c) Procedures related to the capacity of the equipment shall be developed and signed by a registered professional engineer familiar with the equipment.	1926.1417(b)(3) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.
(3) Accessibility of procedures.	1926.1417(c) Accessibility of procedures.
(a) 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.	1926.1417(c)(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.
(b) When rated capacities are available in the cab only in electronic form and in the event of a failure that makes the rated capacities inaccessible, the operator shall immediately cease operations or follow safe shut-down procedures until the rated capacities, in electronic or other form, are available.	1926.1417(c)(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) The operator shall not engage in any practice or activity that diverts his or her attention while actually engaged in operating the equipment, such as the use of cellular phones other than when used for signal communications.	1926.1417(d) The operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when used for signal communications).
(4) Leaving the equipment unattended.	1926.1417(e) Leaving the equipment unattended.
(a) The operator shall not leave the controls while the load is suspended, except when all of the following are met:	1926.1417(e)(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	1926.1417(e)(1)(i) The operator remains adjacent to the equipment and is not

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
other duties.	engaged in any other duties.
(ii) The load is to be held suspended for a period of time exceeding normal lifting operations.	1926.1417(e)(1)(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 and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions.	1926.1417(e)(1)(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 R 408.41023a(2)(a) to (c) and R 408.41023a(4) or (5), are permitted in the fall zone.	1926.1417(e)(1)(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.
(b) The provisions in subrule (4)(a) 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.	1926.1417(e)(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.
(5) Tag-out.	1926.1417(f) Tag-out.
(a) Tagging out of service equipment and functions. When 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. When the employer has taken a function out of service, a tag shall be placed in a conspicuous position stating that the function is out of service and shall not be used.	1926.1417(f)(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.
(b) Response to ‘‘do not operate’’ and tag-out signs.	1926.1417(f)(2) Response to "do not operate"/tag-out signs.
(i) If there is a warning sign, such as a tag-out or maintenance, and do not operate, 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 both of the following:	1926.1417(f)(2)(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.	1926.1417(f)(2)(i)(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.	1926.1417(f)(2)(i)(B) The equipment has been repaired and is working properly.
(ii) If there is a warning sign, tag-out or maintenance, and do not operate, 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 subrule (5)(b)(i)(A) and (B) have been met.	1926.1417(f)(2)(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.
(6) 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.	1926.1417(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.
(7) All controls shall be tested by an operator before beginning a new shift. Any controls that do not operate properly shall be adjusted or repaired before operations are begun.	CURRENT MIOSHA R 408.41010a(8)
(8) Storm warning. When a local storm warning has been issued, the	1926.1417(h) Storm warning. When a local storm warning has been issued,

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
competent person shall determine whether it is necessary to implement manufacturer recommendations for securing the equipment.	the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment.
(9) If equipment adjustments or repairs are necessary both of the following shall be done:	1926.1417(j) If equipment adjustments or repairs are necessary:
(a) The operator shall, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator.	1926.1417(j)(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
(b) The employer shall notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.	1926.1417(j)(2) The employer must notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.
(10) Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.	1926.1417(k) Safety devices and operational aids must not be used as a substitute for the exercise of professional judgment by the operator.
(11) 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.	1926.1417(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.
(12) Before starting to hoist, an operator shall do all of the following:	CURRENT MIOSHA R 408.41025a(11)
(a) Make sure the hoist rope is not kinked.	
(b) Make sure the multiple part lines are not twisted around each other.	
(c) Make sure the hook is not swinging when brought over the load.	
(13) The competent person shall adjust the equipment, or operations, or both to address the effect of wind, ice, and snow on equipment stability and rated capacity.	1926.1417(n) The competent person must adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.
(14) Compliance with rated capacity.	1926.1417(o) Compliance with rated capacity.
(a) The equipment shall not be operated in excess of its rated capacity.	1926.1417(o)(1) The equipment must not be operated in excess of its rated capacity.
(b) The operator shall not be required to operate the equipment in a manner that would violate subrule (14)(a).	1926.1417(o)(2) The operator must not be required to operate the equipment in a manner that would violate paragraph (o)(1) of this section.
(c) Load weight. The operator shall verify that the load is within the rated capacity of the equipment by not less than one of the following methods:	1926.1417(o)(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 shall 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 shall be provided to the operator prior to the lift.	1926.1417(o)(3)(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 shall begin hoisting the load to determine if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation by using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter. If it does, the operator shall not proceed with the lift until he or she verifies the weight of the load in accordance with subrule (14)(c)(i).	1926.1417(o)(3)(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.
(15) The boom or other parts of the equipment shall not contact any	1926.1417(p) The boom or other parts of the equipment must not contact any

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
obstruction.	obstruction.
(16) The equipment shall not be used to drag or pull loads sideways.	1926.1417(q) The equipment must not be used to drag or pull loads sideways.
(17) On wheel-mounted equipment, no loads shall be lifted over the front area, except as permitted by the manufacturer.	1926.1417(r) On wheel-mounted equipment, no loads must be lifted over the front area, except as permitted by the manufacturer.
(18) 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 shall apply to the first lift but not to successive lifts.	1926.1417(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.
(19) 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.	1926.1417(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.
(20) Traveling with a load.	1926.1417(u) Traveling with a load.
(a) Traveling with a load shall be prohibited if the practice is prohibited by the manufacturer.	1926.1417(u)(1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer.
(b) Where traveling with a load, the employer shall ensure all of the following:	1926.1417(u)(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 determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety.	1926.1417(u)(2)(i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes 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 subrule (20)(b)(i) are implemented.	1926.1417(u)(2)(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 shall be maintained.	1926.1417(u)(2)(iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.
(21) Rotational speed of the equipment shall be such that the load does not swing out beyond the radius at which it can be controlled.	1926.1417(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.
(22) A tag or restraint line shall be used if necessary to prevent rotation of the load that would be hazardous.	1926.1417(w) A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.
(23) The brakes shall be adjusted in accordance with manufacturer procedures to prevent unintended movement.	1926.1417(x) The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.
(24) A load in an elevated position shall not be detached from the load line of a crane, derrick, or excavation equipment until the load has been secured to prevent unintentional movement.	CURRENT MIOSHA R 408.41025a(3)
(25) A fuel tank filler pipe for an internal combustion engine that powers a crane or derrick shall be located or guarded to prevent the spillage of fuel onto a hot surface or electrical equipment.	CURRENT MIOSHA R 408.41025a(6)
(26) Fuels shall be transported, stored, and handled as prescribed in construction safety standard part 18 “Fire Protection and Prevention,” as referenced in R 408.41003a.	CURRENT MIOSHA R 408.41025a(9)
(27) A load line shall not be wrapped around the material being lifted.	CURRENT MIOSHA R 408.41025a(10)
(28) A load shall be secured and balanced before the load is lifted more than 6 inches.	CURRENT MIOSHA R 408.41025a(16)
(29) Clothing, personal belongings, tools, and other articles within a cab or operating enclosure shall be stored in cabinets, boxes, or by other means so	CURRENT MIOSHA R 408.41025a(29)

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
as not to interfere with access or operations.	
(30) A portable fire extinguisher that has a rating of not less than 10 BC shall be kept in the cab or operating enclosure. When there is no cab or enclosure, it shall be kept on the jobsite within a 200-foot radius of the equipment and shall be readily available. The operator and maintenance employees shall be trained in the use of the fire extinguisher.	CURRENT MIOSHA R 408.41025a(30)
(31) When night operations are carried out, lighting shall illuminate the immediate working area to a minimum of 10 footcandles and shall not interfere with the operator's vision.	CURRENT MIOSHA R 408.41025a(31)
(32) A rope shall not be used to carry current or as a ground on any crane or derrick.	CURRENT MIOSHA R 408.41025a(33)
(33) An employee shall not ride the bare hook or on a load of material suspended from the hook.	CURRENT MIOSHA R 408.41025a(34)
(34) The operator shall obey a stop or emergency stop signal, irrespective of who gives it.	1926.1417(y) The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.
(35) Swinging locomotive cranes. A locomotive crane shall 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.	1926.1417(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.
(36) Counterweight and ballast.	1926.1417(aa) Counterweight/ballast.
(a) The following applies to equipment other than tower cranes:	1926.1417(aa)(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.	1926.1417(aa)(1)(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 shall not be exceeded.	1926.1417(aa)(1)(ii) The maximum counterweight or ballast specified by the manufacturer for the equipment must not be exceeded.
(b) Counterweight and ballast requirements for tower cranes are specified in R 408.41029a(2)(h).	1926.1417(aa)(2) Counterweight/ballast requirements for tower cranes are specified in § 1926.1435(b)(8).
R 408.41019c Authority to stop operation.	1926.1418 Authority to stop operation.
Rule 1019c. Each equipment operator shall be responsible for those operations that are under the operator's direct control. When there is a concern about 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.
R 408.41020a Fall protection.	1926.1423 Fall protection.
Rule 1020a. (1) Application.	1926.1423(a) Application.
(a) Subrules (2), (3)(c), (5) and (6) of this rule shall apply to all equipment covered by this standard except tower cranes.	1926.1423(a)(1) Paragraphs (b), (c)(3), (e) and (f) of this section apply to all equipment covered by this subpart except tower cranes.
(b) Subrules (3)(a), (3)(b), (4), (7), (10) and (11) of this rule shall apply to all equipment covered by this standard.	1926.1423(a)(2) Paragraphs (c)(1), (c)(2), (d), (g), (j) and (k) of this section apply to all equipment covered by this subpart.
(c) Subrules (3)(d) and (8) of this rule shall apply only to tower cranes.	1926.1423(a)(3) Paragraphs (c)(4) and (h) of this section apply only to tower cranes.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(2) Boom walkways.	1926.1423(b) Boom walkways.
(a) Equipment manufactured after November 8, 2011 with lattice booms shall be equipped with walkways on the boom or booms if the vertical profile of the boom, from cord centerline to cord centerline, is 6 feet or more.	1926.1423(b)(1) Equipment manufactured after November 8, 2011 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.	1926.1423(b)(2) Boom walkway criteria.
(i) The walkways shall be at least 12 inches wide.	1926.1423(b)(2)(i) The walkways must be at least 12 inches wide.
(ii) Guardrails, railings and other permanent fall protection attachments along walkways are:	1926.1423(b)(2)(ii) Guardrails, railings and other permanent fall protection attachments along walkways are:
(A) Not required.	1926.1423(b)(2)(ii)(A) Not required.
(B) Prohibited on booms supported by pendant ropes or bars if guardrails, railings, or attachments could be snagged by the ropes or bars.	1926.1423(b)(2)(ii)(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 they are of the removable type or designed to be installed and removed each time the boom is assembled or disassembled.	1926.1423(b)(2)(ii)(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.	1926.1423(b)(2)(ii)(D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.
(3) Steps, handholds, ladders, grabrails, guardrails and railings.	1926.1423(c) Steps, handholds, ladders, grabrails, guardrails and railings.
(a) Construction safety standard part 45 “Fall Protection,” 1926.502(b), as referenced in R 408.41003a, does not apply to equipment covered by this standard.	1926.1423(c)(1) Section 1926.502(b) does not apply to equipment covered by this subpart.
(b) The employer shall maintain in good condition originally-equipped steps, handholds, ladders and guardrails, railings, or grabrails.	1926.1423(c)(2) The employer must maintain in good condition originally-equipped steps, handholds, ladders and guardrails/railings/grabrails.
(c) Equipment manufactured after November 8, 2011 shall be equipped so as to provide safe access and egress between the ground and the operator work station, including the forward and rear positions, by the provision of devices such as steps, handholds, ladders, and guardrails, railings, or grabrails. These devices shall meet both of the following criteria:	1926.1423(c)(3) Equipment manufactured after November 8, 2011 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, or grabrails shall meet the criteria of the Society of Automotive Engineers (SAE) J185 “Access Systems for Off-Road Machines,” May 2003 edition, which is adopted by reference in R 408.41003a , or the International Organization for Standardization (ISO) 11660–2 “Cranes – Access, Guards and Restraints – Part 2: Mobile Cranes,” 1994 edition, which is adopted by reference in R 408.41003a, except where infeasible.	1926.1423(c)(3)(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 or stepping surfaces, except for crawler treads, shall have slip-resistant features or properties, such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint.	1926.1423(c)(3)(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).
(d) Tower cranes manufactured after November 8, 2011 shall be equipped so as to provide safe access and egress between the ground and the cab, machinery platforms, and tower or mast, by the provision of devices such as steps, handholds, ladders, and guardrails, railings, or grabrails. These devices shall meet both of the following criteria:	1926.1423(c)(4) Tower cranes manufactured after November 8, 2011 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, or grabrails shall meet	1926.1423(c)(4)(i) Steps, handholds, ladders, and guardrails/railings/grabrails

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
the criteria of ISO 11660–1 “Cranes – Access, Guards and Restraints – Part 1: General,” 2008 edition, and ISO 11660–3 “Cranes – Access, Guards and Restraints – Part 3: Tower Cranes,” 2008 edition, or SAE J185 “Access Systems for Off-Road Machines,” May 2003 edition, all of which are adopted by reference in R 408.41003a, except where infeasible.	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.
(ii) Walking or stepping surfaces shall have slip-resistant features or properties, such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint.	1926.1423(c)(4)(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).
(4) Personal fall arrest and fall restraint systems. Personal fall arrest system components shall be used in personal fall arrest and fall restraint systems and shall conform to the criteria in construction safety standard part 45 “Fall Protection,” 1926.502(d), as referenced in R 408.41003a, except that 1926.502(d)(15) shall not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses shall be used in personal fall arrest and fall restraint systems.	1926.1423(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.
(5) For non-assembly or disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking or working surface with an unprotected side or edge more than 6 feet above a lower level.	1926.1423(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:
(a) When moving point-to-point:	1926.1423(e)(1) When moving point-to-point:
(i) On non-lattice booms, whether horizontal or not horizontal.	1926.1423(e)(1)(i) On non-lattice booms (whether horizontal or not horizontal).
(ii) On lattice booms that are not horizontal.	1926.1423(e)(1)(ii) On lattice booms that are not horizontal.
(iii) On horizontal lattice booms where the fall distance is 15 feet or more.	1926.1423(e)(1)(iii) On horizontal lattice booms where the fall distance is 15 feet or more.
(b) While at a work station on any part of the equipment, including any type of boom, except when the employee is at or near draw-works when the equipment is running, in the cab, or on the deck.	1926.1423(e)(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.
(6) For assembly or disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking or 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 when the equipment is running, in the cab, or on the deck.	1926.1423(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 (when the equipment is running), in the cab, or on the deck.
(7) Anchorage criteria.	1926.1423(g) Anchorage criteria.
(a) Construction safety standard part 45 “Fall Protection,” 1926.502(d)(15) and 1926.502(e)(2), as referenced in R 408.41003a, shall apply to equipment covered by this standard only to the extent delineated in subrule (7)(b).	1926.1423(g)(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.
(b) Anchorages for personal fall arrest and positioning device systems.	1926.1423(g)(2) Anchorages for personal fall arrest and positioning device systems.
(i) Personal fall arrest 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 criteria in construction safety standard part 45 “Fall Protection,” 1926.502(d)(15), as referenced in R 408.41003a, would not be met.	1926.1423(g)(2)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(ii) Positioning device 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 criteria in construction safety standard part 45 “Fall Protection,” 1926.502(e)(2), as referenced in R 408.41003a, would not be met.	1926.1423(g)(2)(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, shall meet the anchorage criteria in construction safety standard part 45 “Fall Protection,” 1926.502(d)(15) for personal fall arrest systems and 1926.502(e)(2) for positioning device systems, as referenced in R 408.41003a.	1926.1423(g)(2)(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.
(c) Anchorages for fall restraint systems. Fall 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.	1926.1423(g)(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.
(8) Tower cranes.	1926.1423(h) Tower cranes.
(a) For work other than erecting, climbing, and dismantling, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking or 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.	1926.1423(h)(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.
(b) For erecting, climbing, and dismantling work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking or working surface with an unprotected side or edge more than 15 feet above a lower level.	1926.1423(h)(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) [Reserved.]	1926.1423(i) [Reserved.]
(10) Anchoring to the load line. A personal fall arrest system may be anchored to the crane or derrick’s hook, or other part of the load line, where all of the following requirements are met:	1926.1423(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:
(a) A qualified person has determined that the set-up and rated capacity of the crane or derrick, including the hook, load line and rigging, meets or exceeds the requirements in construction safety standard part 45 “Fall Protection,” R 1926.502(d)(15), as referenced in R 408.41003a.	1926.1423(j)(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).
(b) The equipment operator shall be at the work site and shall be informed that the equipment is being used for this purpose.	1926.1423(j)(2) The equipment operator must be at the work site and informed that the equipment is being used for this purpose.
(c) No load shall be suspended from the load line when the personal fall arrest system is anchored to the crane or derrick’s hook or other part of the load line.	1926.1423(j)(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).
(11) Training. The employer shall train each employee who may be exposed to fall hazards while on, or hoisted by, equipment covered by this standard on both of the following:	1926.1423(k) Training. The employer must train each employee who may be exposed to fall hazards while on, or hoisted by, equipment covered by this subpart on all of the following:
(a) The requirements in this part that address fall protection.	1926.1423(k)(1) the requirements in this subpart that address fall protection.
(b) The applicable requirements in construction safety standard part 45 “Fall Protection,” R 1926.500 and R 1926.502, as referenced in R 408.41003a.	1926.1423(k)(2) the applicable requirements in §§ 1926.500 and 1926.502.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
R 408.41021a Hoisting personnel.	1926.1431 Hoisting personnel.
Rule 1021a. The requirements of this rule are supplemental to the other requirements in this standard 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.
(1) The use of equipment to hoist employees shall be 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 subrule shall not apply to work covered by construction safety standard part 28 "Personnel Hoisting in Steel Erection," as referenced in R 408.41003a.	1926.1431(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.
(2) Use of personnel platform.	1926.1431(b) Use of personnel platform.
(a) When using equipment to hoist employees, the employees shall be in a personnel platform that meets the requirements of subrule (6).	1926.1431(b)(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.
(b) Exceptions. A personnel platform shall not be required for hoisting employees under the following conditions:	1926.1431(b)(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 subrule (16) for requirements for hoisting these employees.	1926.1431(b)(2)(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 subrule (17) for requirements for hoisting these employees.	1926.1431(b)(2)(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 subrule (19) for requirements for hoisting these employees.	1926.1431(b)(2)(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 subrule (20) for requirements for hoisting these employees.	1926.1431(b)(2)(iv) In storage-tank (steel or concrete), shaft and chimney operations (see paragraph (s) of this section for requirements for hoisting these employees).
(3) Equipment set-up.	1926.1431(c) Equipment set-up.
(a) The equipment shall be uniformly level, within 1% of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable.	1926.1431(c)(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.
(b) Equipment with outriggers or stabilizers shall have all of them extended and locked. The amount of extension shall be the same for all outriggers and stabilizers, and be in accordance with manufacturer procedures and load charts.	1926.1431(c)(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.
(4) Equipment criteria.	1926.1431(d) Equipment criteria.
(a) Capacity: Use of suspended personnel platforms. The total load with the platform loaded, including the hook, load line and rigging, shall not exceed 50% of the rated capacity for the radius and configuration of the equipment, except during proof testing.	1926.1431(d)(1) Capacity: Use of suspended personnel platforms. The 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.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(b) Capacity: Use of boom-attached personnel platforms. The total weight of the loaded personnel platform shall not exceed 50% of the rated capacity for the radius and configuration of the equipment, except during proof testing.	1926.1431(d)(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).
(c) Capacity: Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to subrule (2)(b), the total load, including the hook, load line, rigging and any other equipment that imposes a load, shall not exceed 50% of the rated capacity for the radius and configuration of the equipment, except during proof testing.	1926.1431(d)(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.
(d) Load and boom hoist drum brakes, swing brakes, and locking devices, such as pawls or dogs, shall be engaged when the occupied personnel platform is in a stationary working position.	1926.1431(d)(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.
(5) Devices.	1926.1431(d)(5) Devices.
(a) Equipment, except for derricks and articulating cranes, with a variable angle boom shall be equipped with both of the following:	1926.1431(d)(5)(i) Equipment (except for derricks and articulating cranes) with a variable angle boom must be equipped with all of the following:
(i) A boom angle indicator, readily visible to the operator.	1926.1431(d)(5)(i)(A) A boom angle indicator, readily visible to the operator, and
(ii) A boom hoist limiting device.	1926.1431(d)(5)(i)(B) A boom hoist limiting device.
(b) Articulating cranes shall be equipped with a properly functioning automatic overload protection device.	1926.1431(d)(5)(ii) Articulating cranes must be equipped with a properly functioning automatic overload protection device.
(c) Equipment with a luffing jib shall be equipped with both of the following:	1926.1431(d)(5)(iii) Equipment with a luffing jib must be equipped with:
(i) A jib angle indicator, readily visible to the operator.	1926.1431(d)(5)(iii)(A) A jib angle indicator, readily visible to the operator, and.
(ii) A jib hoist limiting device.	1926.1431(d)(5)(iii)(B) A jib hoist limiting device.
(d) An employer shall ensure that a crane that has a telescoping boom is equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or shall ensure that an accurate determination of the load radius to be used during the lift is made before hoisting personnel.	1926.1431(d)(5)(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.
(e) An employer shall ensure the use of a positive acting device to prevent contact between the load block or overhaul ball and the boom tip, anti-2-blocking device, or a system that shall be used to deactivate the hoisting action before damage occurs in the event of a 2-blocking situation, 2-block damage prevention feature.	1926.1431(d)(5)(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.
(f) The load line hoist drum shall have a system or device on the powertrain, other than the load hoist brake, that regulates the lowering rate of the speed of the hoist mechanism, controlled load lowering. Free-fall is prohibited.	1926.1431(d)(5)(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).

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(g) Proper operation required. Personnel hoisting operations shall not begin unless the devices listed in subrule (5) 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. See R 408.41019b for tag-out and related requirements.	1926.1431(d)(5)(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.)
(h) Direct attachment of a personnel platform to a luffing jib is prohibited.	1926.1431(d)(6) Direct attachment of a personnel platform to a luffing jib is prohibited.
(6) Personnel platform criteria. A work platform shall comply with all of the following requirements:	1926.1431(e) Personnel platform criteria. 1926.1431(e)(1) A qualified person familiar with structural design must design the personnel platform and attachment/suspension system used for hoisting personnel.
(a) 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.	1926.1431(e)(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.
(b) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.	1926.1431(e)(3) The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform.
(c) Be designed and constructed by qualified personnel who are designated by, and responsible to, the employer.	
(d) A welder who welds work platforms shall comply with the requirements of the American Welding Society (AWS) standards AWS standard “IHS AWSC Structural Welding Code,” 2000 edition, AWS standard D14.1 “Welding of Industrial and Mill Cranes and Other Material Handling Equipment,” 1997 edition, AWS standard B1.10 “Guide for the Nondestructive Inspection of Welds,” 1986 edition, and AWS standard D14.4 “Class and Application of Welded Joints for Machinery Equipment,” 1997 edition. These standards are adopted by reference in R 408.41003a.	1926.1431(e)(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.
(e) The personnel platform, 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.	1926.1431(e)(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.
(f) The personnel platform shall be equipped with a guardrail system that meets the requirements of construction safety standard part 45 “Fall Protection,” as referenced in R 408.41003a, and shall be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal that have openings no greater than 1⁄2 inch (1.27 cm). Points to which personal fall arrest systems are attached shall meet the anchorage requirements in construction safety standard part 45 “Fall Protection.”	1926.1431(e)(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 (1.27 cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part.
(g) A grab rail shall be installed inside the entire perimeter of the personnel platform except for access gates/doors.	1926.1431(e)(7) A grab rail must be installed inside the entire perimeter of the personnel platform except for access gates/doors.
(h) Access gates or doors. If installed, access gates or doors of all types, including swinging, sliding, folding, or other types, shall 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	1926.1431(e)(8) Access gates/doors. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must: 1926.1431(e)(8)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
occupant, then the access gate or door may swing outward. Access gates and doors shall be equipped with a device that prevents accidental opening.	inward and allow safe entry for the platform occupant, then the access gate/door may swing outward. 1926.1431(e)(8)(ii) Be equipped with a device that prevents accidental opening.
(i) A platform gate shall be securely fastened during all travel, and shall be opened only during egress from, or access to, the work platform. The platform shall be used only for positioning employees at otherwise inaccessible locations to perform work and shall not be used as an elevator.	CURRENT MIOSHA R 408.41015a(4)
(j) Headroom shall be sufficient to allow employees to stand upright in the platform.	1926.1431(e)(9) Headroom must be sufficient to allow employees to stand upright in the platform.
(k) 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 openings up to 1⁄2 inch, unless full protection is necessary.	1926.1431(e)(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.
(l) The employer shall ensure that all rough edges exposed to contact by employees are surfaced or smoothed to prevent injury to employees from puncture or lacerations.	1926.1431(e)(11) All edges exposed to employee contact must be smooth enough to prevent injury.
(m) Have a permanently affixed sign that shall specify all of the following information:	CURRENT MIOSHA R 408.41015a(2)(k) and 1926.1431(e)(12) The weight of the platform and its rated capacity must be conspicuously posted on the platform with a plate or other permanent marking.
(i) Maximum number of passengers.	
(ii) Work platform identification number.	
(iii) Maximum rated load.	
(iv) Weight of the platform.	
(n) Be easily identifiable by high-visibility color or marking.	
(7) Personnel platform loading.	1926.1431(f) Personnel platform loading.
(a) The personnel platform shall not be loaded in excess of its rated capacity.	1926.1431(f)(1) The personnel platform must not be loaded in excess of its rated capacity.
(b) Use.	1926.1431(f)(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.	1926.1431(f)(2)(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 subrule (7)(c) may be in the platform for trial lifts.	1926.1431(f)(2)(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.
(c) Materials and tools shall comply with both of the following:	1926.1431(f)(3) Materials and tools must be:
(i) Be secured to prevent displacement.	1926.1431(f)(3)(i) Secured to prevent displacement.
(ii) Be evenly distributed within the confines of the platform while it is suspended.	1926.1431(f)(3)(ii) Evenly distributed within the confines of the platform while it is suspended.
(d) The number of employees occupying the personnel platform shall not exceed the maximum number the platform was designed to hold or the number required to perform the work, whichever is less.	1926.1431(f)(4) The number of employees occupying the personnel platform must not exceed the maximum number the platform was designed to hold or the number required to perform the work, whichever is less.
(8) Attachment and rigging.	1926.1431(g) Attachment and rigging.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(a) Hooks and other detachable devices.	1926.1431(g)(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:	1926.1431(g)(1)(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.	1926.1431(g)(1)(i)(A) Of a type that can be closed and locked, eliminating the throat opening.
(B) Closed and locked when attached.	1926.1431(g)(1)(i)(B) Closed and locked when attached.
(ii) Shackles used in place of hooks shall be of the alloy anchor type, and include either:	1926.1431(g)(1)(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.	1926.1431(g)(1)(ii)(A) A bolt, nut and retaining pin, in place; or
(B) Of the screw type, with the screw pin secured from accidental removal.	1926.1431(g)(1)(ii)(B) Of the screw type, with the screw pin secured from accidental removal.
(iii) Where other detachable devices are used, they shall be of the type that can be closed and locked to the same extent as the devices addressed in subrules (8)(a)(i) and (ii). These devices shall be closed and locked when attached.	1926.1431(g)(1)(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.
(vi) The load line of a crane that is used to raise or lower a work platform shall be equipped with a swivel to reduce the wire rope-induced rotation of the work platform, unless the use of the swivel is not recommended by the wire rope manufacturer.	CURRENT MIOSHA R 408.41018a(16)
(vii) Wire rope clips shall be prohibited.	CURRENT MIOSHA R 408.41015a(2)(g)
(b) 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 in a manner that ensures that the load is evenly divided among the bridle legs.	1926.1431(g)(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.
(c) Rigging hardware, including wire rope, shackles, rings, master links, and other rigging hardware, and hooks shall be capable of supporting, without failure, at least 5 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 10 times the maximum intended load.	1926.1431(g)(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.
(d) Eyes in wire rope slings shall be fabricated with thimbles.	1926.1431(g)(4) Eyes in wire rope slings must be fabricated with thimbles.
(e) 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. The bridles and associated rigging shall not have been used for any purpose other than hoisting personnel.	1926.1431(g)(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.
(9) Trial lift and inspection.	1926.1431(h) Trial lift and inspection.
(a) A trial lift of an unoccupied personnel platform that is loaded at least to the anticipated lift weight shall be made from ground level, or any other location where employees will enter the platform, to each location to which the personnel platform is to be hoisted and positioned. The trial lift shall be	1926.1431(h)(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 platform is to be hoisted and positioned. Where there is more than one location

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
performed immediately before placing personnel on the platform. The competent person shall determine that all systems, controls, and safety devices are activated and functioning properly, that interferences do not exist, and that all configurations necessary to reach the work locations will allow the operator to remain under the 50% limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform as provided in subrule (7)(c) for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single setup position.	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. 1926.1431(h)(3)(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. 1926.1431(h)(3)(ii) Nothing interferes with the equipment or the personnel platform in the course of the trial lift.
(b) The trial lift shall be repeated before hoisting employees when the crane or derrick is moved and set up in a new location or returned to a previously used location. The trial lift shall be repeated when the lift route is changed, unless the competent person determines that the route change is not significant and the route change would not affect the safety of hoisted employees.	1926.1431(h)(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: 1926.1431(h)(2)(i) The equipment is moved and set up in a new location or returned to a previously used location. 1926.1431(h)(2)(ii) The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety.
(c) The competent person shall comply with all the following:	1926.1431(h)(3) The competent person must determine that:
(i) Determine that the lift will not exceed 50% of the equipment's rated capacity at any time during the lift.	1926.1431(h)(3)(iii) The lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift.
(ii) Confirm that the load radius to be used during the lift has been accurately determined.	1926.1431(h)(3)(iv) The load radius to be used during the lift has been accurately determined.
(iii) Conduct a visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground immediately after the trial lift to determine whether the testing has exposed a defect or produced an adverse effect upon a component or structure.	1926.1431(h)(4) Immediately after the trial lift, the competent person must: 1926.1431(h)(4)(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.
(iv) Confirm that, upon the completion of the trial lift process, the test weight has been removed.	1926.1431(h)(4)(ii) Confirm that, upon the completion of the trial lift process, the test weight has been removed.
(d) Immediately prior to each lift the platform shall be hoisted a few inches with the personnel, materials, and tools on board and inspected by a competent person to ensure that it is secure and properly balanced.	1926.1431(h)(5) Immediately prior to each lift: 1926.1431(h)(5)(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.
(i) The following conditions shall be determined by a competent person to exist before the lift of personnel proceeds:	1926.1431(h)(5)(ii) The following conditions must be determined by a competent person to exist before the lift of personnel proceeds:
(A) Multiple part lines are not twisted around each other.	1926.1431(h)(5)(ii)(B) Multiple part lines must not be twisted around each other.
(B) The primary attachment is centered over the platform.	1926.1431(h)(5)(ii)(C) The primary attachment must be centered over the platform.
(C) The hoisting system shall be inspected if the load rope is slack to ensure that all ropes are properly seated on drums and in sheaves.	1926.1431(h)(5)(ii)(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.
(D) Hoist ropes shall be free of deficiencies in accordance with R 408.41013a(1).	1926.1431(h)(5)(ii)(A) Hoist ropes must be free of deficiencies in accordance with § 1926.1413(a).
(e) Any condition found during the trial lift and subsequent inspection that	1926.1431(h)(6) Any condition found during the trial lift and subsequent

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
fails to meet a requirement of this standard or otherwise creates a safety hazard shall be corrected before hoisting personnel. See R 408.41019b 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. (See § 1926.1417 for tag-out and related requirements.)
(10) Load testing.	CURRENT MIOSHA R 408.41016a
(a) Before a work platform is used after fabrication, it shall be load-tested to 2 times the maximum intended load or rated capacity.	CURRENT MIOSHA R 408.41016a(1)
(b) A work platform shall also be load-tested as follows:	CURRENT MIOSHA R 408.41016a(2)
(i) Annually, if used on a regular basis.	CURRENT MIOSHA R 408.41016a(2)(a)
(ii) Before use, if the interval of time between use is more than 1 year.	CURRENT MIOSHA R 408.41016a(2)(b)
(iii) After the crane or work platform has been moved to another location on the jobsite.	CURRENT MIOSHA R 408.41016a(2)(c)
(c) A load test shall follow the maximum intended lift of the work platform.	CURRENT MIOSHA R 408.41016a(3)
(d) After any repair or modification, a platform shall be retested to 2 times its rated capacity.	CURRENT MIOSHA R 408.41016a(5)
(e) A record of the load test shall be maintained by the employer for the life of the platform.	CURRENT MIOSHA R 408.41016a(6)
(11) Proof testing.	1926.1431(j) Proof testing.
(a) At each jobsite, before hoisting employees on the personnel platform and after any repair or modification, the platform and rigging shall be proof tested, as required in subrule (10), to 125% of the platform's rated capacity by holding it in a suspended position for 5 minutes with the test load evenly distributed on the platform. Proof testing may be done concurrently with the trial lift. After proof testing, a competent person shall inspect the platform and rigging. If a deficiency is found, it shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.	1926.1431(j)(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. 1926.1431(j)(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. 1926.1431(j)(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.)
(b) Personnel hoisting shall not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.	1926.1431(j)(4) Personnel hoisting must not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.
(12) Work practices.	1926.1431(k) Work practices.
(a) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform. The maximum rate of travel of a work platform shall be 100 feet per minute. Free-falling shall be prohibited when using the platform to lower personnel.	1926.1431(k)(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.
(b) Platform occupants shall comply with all of the following:	1926.1431(k)(2) Platform occupants must:
(i) Keep all parts of their bodies inside the platform during raising, lowering, and horizontal movement. This provision shall not apply to an occupant of the platform when necessary to position the platform or while performing the	1926.1431(k)(2)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
duties of a signal person.	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 or device to raise their working height.	1926.1431(k)(2)(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.	1926.1431(k)(2)(iii) Not pull the platform out of plumb in relation to the hoisting equipment.
(iv) Not leave the suspended work platform, except for a structural steel connector or a pile driver. If a structural steel connector or a pile driver leaves the suspended platform, a gate shall be provided as prescribed in subrule (6)(e). The gate shall comply with the requirements of construction safety standard part 45 “Fall Protection,” as referenced in R 408.41003a. The gate shall be securely fastened during all travel and opened only during access to, or egress from, the work platform.	CURRENT MIOSHA R 408.41018a(21)
(v) 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 the employer can demonstrate that securing to the structure would create a greater hazard.	1926.1431(k)(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.
(c) If the platform is tied to the structure, the operator shall not move the platform until the he or she receives confirmation that it is freely suspended.	1926.1431(k)(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.
(d) Tag lines shall be used when necessary to control the platform.	1926.1431(k)(5) Tag lines must be used when necessary to control the platform.
(e) The operator of the crane shall remain at the controls with the engine running when an occupied work platform is in the suspended position.	CURRENT MIOSHA R 408.41021a(3)
(f) A crane that is used to raise or lower a work platform shall be set level on a firm base and shall have the travel lock engaged.	CURRENT MIOSHA R 408.41018a(18)
(g) Platforms without controls. When the platform is not equipped with controls, the equipment operator shall remain at the equipment controls, on site, and in view of the equipment, at all times while the platform is occupied.	1926.1431(k)(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.
(h) Platforms with controls. When the platform is equipped with controls, all of the following shall be met at all times while the platform is occupied:	1926.1431(k)(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 shall be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation.	1926.1431(k)(7)(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 shall be at a set of equipment controls that include boom and swing functions of the equipment, and shall be on site and in view of the equipment.	1926.1431(k)(7)(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 shall be in the platform or on the equipment.	1926.1431(k)(7)(iii) The platform operating manual must be in the platform or on the equipment.
(i) Environmental conditions.	1926.1431(k)(8) Environmental conditions.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(i) Wind. When wind speed, sustained or gusts, exceeds 20 miles per hour 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 safe, the lifting operation shall not begin. If the lifting operation is already in progress, it shall be terminated.	1926.1431(k)(8)(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 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 safe, the lifting operation shall not begin. If the lifting operation is already in progress, it shall be terminated.	1926.1431(k)(8)(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).
(j) Employees being hoisted shall remain in direct communication with the signal person, where used, or the operator.	1926.1431(k)(9) Employees being hoisted must remain in direct communication with the signal person (where used), or the operator.
(k) Fall protection.	1926.1431(k)(10) Fall protection.
(i) Except when 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. When working over or near water, the requirements of construction safety standard part 6 “Personal Protective Equipment,” as referenced in R 408.41003a, shall apply.	1926.1431(k)(10)(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 or anchorage used to comply with subrule(12)(l)(i), shall meet the requirements in construction safety standard part 45 “Fall Protection,” as referenced in R 408.41003a.	1926.1431(k)(10)(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.
(l) Other load lines.	1926.1431(k)(11) Other load lines.
(i) When a crane is being used to raise or lower persons on a work platform, another load shall not be attached to the work platform and another load shall not be raised or lowered at the same time by the same crane.	1926.1431(k)(11)(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 may be hoisted by this 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.	1926.1431(k)(11)(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.
(m) 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) When 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) When employees are hoisted while the equipment is traveling, all of the following criteria shall be met: (A) Equipment travel shall be restricted to a fixed track or runway. (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	1926.1431(k)(12) Traveling--equipment other than derricks. 1926.1431(k)(12)(i) Hoisting of employees while the equipment is traveling is prohibited, except for: 1926.1431(k)(12)(i)(A) Equipment that travels on fixed rails; or 1926.1431(k)(12)(i)(B) Where the employer demonstrates that there is no less hazardous way to perform the work. 1926.1431(k)(12)(i)(C) This exception does not apply to rubber-tired equipment. 1926.1431(k)(12)(ii) Where employees are hoisted while the equipment is traveling, all of the following criteria must be met: 1926.1431(k)(12)(ii)(A) Equipment travel must be restricted to a fixed track or runway. 1926.1431(k)(12)(ii)(B) Where a runway is used, it must be a firm, level surface

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
existing surface may be used as long as it meets these criteria. (C) Equipment 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 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 subrule (9) of this section which tests the lift route.	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. 1926.1431(k)(12)(ii)(C) Equipment travel must be limited to boom length. 1926.1431(k)(12)(ii)(D) The boom must be parallel to the direction of travel, except where it is safer to do otherwise. 1926.1431(k)(12)(ii)(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.
(n) Traveling—derricks. Derricks shall be prohibited from traveling while personnel are hoisted.	1926.1431(k)(13) Traveling--derricks. Derricks are prohibited from traveling while personnel are hoisted.
(13) [Reserved.]	1926.1431(l) [Reserved.]
(14) Pre-lift meeting.	1926.1431(m) Pre-lift meeting. A pre-lift meeting must be:
(a) The employer shall hold a pre-lift meeting to review the appropriate requirements and procedures to be followed. The meeting shall be held before the trial lift at each new work location and shall be repeated for any employees who are newly assigned to the operation.	1926.1431(m)(1) Held to review the applicable requirements of this section and the procedures that will be followed. 1926.1431(m)(3) Held prior to the trial lift at each new work location, and must be repeated for any employees newly assigned to the operation.
(b) All of the following entities shall attend the pre-lift meeting:	1926.1431(m)(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.
(i) The crane operator.	
(ii) The signalperson, if necessary for the lift.	
(iii) Employees to be lifted.	
(iv) The person who is responsible for the task to be performed.	
(15) 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 shall be prohibited, except for work covered by construction safety standard part 16 “Power Transmission and Distribution,” as referenced in R 408.41003a.	1926.1431(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).
(16) 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 shall be met:	1926.1431(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:
(a) The employee shall be in either a personnel platform or on a boatswain’s chair.	1926.1431(o)(1) The employee must be in either a personnel platform or on a boatswain’s chair.
(b) If using a personnel platform, subrules (1) to (15) shall apply.	1926.1431(o)(2) If using a personnel platform, paragraphs (a) through (n) of this section apply.
(c) If using a boatswain’s chair all of the following requirements shall be met:	1926.1431(o)(3) If using a boatswain's chair:
(i) The following subrules shall apply: (1), (3), (4)(a), (4)(c), (4)(d), (6)(a), (6)(c), (7)(a), (7)(b)(i), (7)(c)(i), (7)(f), (8), (9), (12)(a), (12)(h), (12)(j), (12)(k), (12)(m)(i), (14), (15). Where the terms ‘‘personnel platform’’ or ‘‘platform’’ are used in these subrules, they shall be substituted with the term ‘‘boatswain’s chair.’’	1926.1431(o)(3)(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 "boatswain's chair."
(ii) A signal person shall be stationed at the shaft opening.	1926.1431(o)(3)(ii) A signal person must be stationed at the shaft opening.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(iii) The employee shall be hoisted in a slow, controlled descent and ascent.	1926.1431(o)(3)(iii) The employee must 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 or derrick.	1926.1431(o)(3)(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 shall meet the applicable requirements in construction safety standard part 45 “Fall Protection,” as referenced in R 408.41003a.	1926.1431(o)(3)(v) The fall protection equipment must meet the applicable requirements in § 1926.502.
(vi) The boatswain’s chair, 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.	1926.1431(o)(3)(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) Not more than 1 person shall be hoisted at a time.	1926.1431(o)(3)(vii) No more than one person must be hoisted at a time.
(17) Hoisting personnel for pile driving operations. When hoisting an employee in pile driving operations all of the following requirements shall be met:	1926.1431(p) Hoisting personnel for pile driving operations. When hoisting an employee in pile driving operations, the following requirements must be met:
(a) The employee shall be in a personnel platform or boatswain’s chair.	1926.1431(p)(1) The employee must be in a personnel platform or boatswain's chair.
(b) For lattice boom cranes the cable shall be clearly marked 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 the cable shall be clearly marked 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.	1926.1431(p)(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.
(c) If using a personnel platform, subrules (2) to (15) shall apply.	1926.1431(p)(3) If using a personnel platform, paragraphs (b) through (n) of this section apply.
(d) If using a boatswain’s chair, all of the following requirements shall be met:	1926.1431(p)(4) If using a boatswain's chair:
(i) The following subrules shall apply: (1), (3), (4)(a), (4)(c), (4)(d), (6)(a), (6)(c), (7)(a), (7)(b)(i), (7)(c)(i), (7)(f), (8), (9), (12)(a), (12)(h), (12)(j), (12)(k), (12)(m)(i), (14), (15). Where the terms ‘‘personnel platform’’ or ‘‘platform’’ are used in these subrules, they shall be substituted with the term “boatswains chair.’’	1926.1431(p)(4)(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 shall be hoisted in a slow, controlled descent and ascent.	1926.1431(p)(4)(ii) The employee must 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.	1926.1431(p)(4)(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 shall meet the applicable requirements in construction safety standard part 45 “Fall Protection,” as referenced in R 408.41003a.	1926.1431(p)(4)(iv) The fall protection equipment must meet the applicable requirements in § 1926.502.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(v) The boatswain's chair, 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.	1926.1431(p)(4)(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) Not more than 1 person shall be hoisted at a time.	1926.1431(p)(4)(vi) No more than one person must be hoisted at a time.
(18) [Reserved.]	1926.1431(q) [Reserved.]
(19) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements shall be met:	1926.1431(r) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements must be met:
(a) The employee shall be in either a personnel platform or a marine-hoisted personnel transfer device.	1926.1431(r)(1) The employee must be in either a personnel platform or a marine-hoisted personnel transfer device.
(b) If using a personnel platform, subrules (1) to (15) shall apply.	1926.1431(r)(2) If using a personnel platform, paragraphs (a) through (n) of this section apply.
(c) If using a marine-hoisted personnel transfer device, all of the following requirements shall be met:	1926.1431(r)(3) If using a marine-hoisted personnel transfer device:
(i) The following subrules shall apply: (1), (3)(b), (4)(a), (4)(c), (4)(d), (6)(a), (6)(b), (6)(c), (6)(j)(iv), (7)(a), (7)(f), (8), (9), (11), (12)(a), (12)(j), (12)(k), (12)(m)(i), (12)(n), (14), (15). Where the terms ''personnel platform'' or ''platform'' are used in these subrules, they shall be substituted with the term ''marine-hoisted personnel transfer device.''	1926.1431(r)(3)(i) The following paragraphs of this section apply: (a), (c)(2), (d)(1), (d)(3), (d)(4), (e)(1) through (5), (e)(12), (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 shall be used only for transferring workers.	1926.1431(r)(3)(ii) The transfer device must 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.	1926.1431(r)(3)(iii) The number of workers occupying the transfer device must 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.	1926.1431(r)(3)(iv) Each employee must wear a U.S. Coast Guard personal flotation device approved for industrial use.
(20) Hoisting personnel for steel or concrete storage-tanks, shaft and chimney operations. When hoisting an employee in steel or concrete storage tanks, shaft and chimney operations, the following requirements shall be met:	1926.1431(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:
(a) The employee shall be in a personnel platform except when the employer can demonstrate that use of a personnel platform is infeasible. In this case, a boatswain's chair shall be used.	1926.1431(s)(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.
(b) If using a personnel platform, subrules (1) to (15) shall apply.	1926.1431(s)(2) If using a personnel platform, paragraphs (a) through (n) of this section apply.
(c) If using a boatswain's chair, all of the following requirements shall be met:	1926.1431(s)(3) If using a boatswain's chair:
(i) The following subrules shall apply: (1), (3), (4)(a), (4)(c), (4)(d), (6)(a), (6)(c), (7)(a), (7)(b)(i), (7)(c)(i), (7)(f), (8), (9), (12)(a), (12)(h), (12)(j), (12)(k), (12)(m)(i), (14), (15). Where the terms ''personnel platform'' or ''platform'' are used in these subrules, they shall be substituted with the term ''boatswain's chair.''	1926.1431(s)(3)(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 shall be hoisted in a slow, controlled descent and ascent.	1926.1431(s)(3)(ii) The employee must be hoisted in a slow, controlled descent and ascent.
(iii) The employee shall use personal fall protection equipment, including a	1926.1431(s)(3)(iii) The employee must use personal fall protection equipment,

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
full body harness, attached independent of the crane or derrick. When there is no adequate structure for attachment of personal fall arrest equipment as required in construction safety standard part 45 “Fall Protection,” 1926.502(d)(15), as referenced in R 408.41003a, the attachment shall be to the lower load block or overhaul ball.	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 shall meet the applicable requirements in construction safety standard part 45 “Fall Protection,” as referenced in R 408.41003a.	1926.1431(s)(3)(iv) The fall protection equipment must meet the applicable requirements in § 1926.502.
(v) The boatswain’s chair, 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.	1926.1431(s)(3)(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) Not more than 1 person shall be hoisted at a time.	1926.1431(s)(3)(vi) No more than one person must be hoisted at a time.
R 408.41021b Work platforms; derrick hoist machine requirements.	CURRENT MIOSHA R 408.41020a
Rule 1021b. (a) A derrick shall comply with the provisions of ASME standard B30.7 “Base-mounted Drum Hoists,” 1994 edition, which is adopted by reference in R 408.41003a, and be inspected on the jobsite by the employer to assure compliance. A record of the inspection shall be available on the jobsite.	
(b) A derrick shall have full power for raising and lowering the work platform. Free-spooling is prohibited.	
(c) The controls of a derrick shall be deadman controls that will return the machine to neutral and engage the drum brakes.	
(d) A derrick shall be positioned so that the distance between the drum and foot block will allow proper spooling of wire rope.	
(e) A derrick base shall be properly aligned and anchored on 4 corners to prevent movement. A 3 or 4 drum-hoist may be anchored by only the two rear corners of the base when the cables from the drums extend horizontally to the foot block, and the anchors are designed by a registered professional engineer, to resist all cable loads applied to the hoist.	
(f) The foot block of a derrick shall be anchored to prevent displacement and be supported to maintain proper alignment.	
(g) All wire rope running lines shall be guarded from the drum of the hoist to the foot block and vertically where accidental contact is possible.	
(h) A proper fleet angle shall be maintained between the foot block and the drum of the base-mounted drum hoist.	
(i) The employer shall ensure that a hoist house for a derrick has a roof to protect the operator from falling objects and is enclosed to protect the operator from the weather.	
R 408.41022a Work area control.	1926.1424 Work area control
Rule 1022a. (1) Swing radius hazards.	1926.1424(a) Swing radius hazards.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(a) The requirements in subrule (1)(b) shall apply when there are accessible areas in which the equipment's rotating superstructure, whether permanently or temporarily mounted, poses a reasonably foreseeable risk of either of the following:	1926.1424(a)(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.	1926.1424(a)(1)(i)Striking and injuring an employee; or
(ii) Pinching or crushing an employee against another part of the equipment or another object.	1926.1424(a)(1)(ii)Pinching/crushing an employee against another part of the equipment or another object.
(b) To prevent employees from entering these hazard areas, the employer shall do all of the following:	1926.1424(a)(2)To prevent employees from entering these hazard areas, the employer must:
(i) Train each employee assigned to work on or near the equipment in how to recognize struck-by and pinch or crush hazard areas posed by the rotating superstructure.	1926.1424(a)(2)(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 shall be clearly marked by danger signs and high visibility markings on the equipment that identify the hazard areas. In addition, the employer shall train each employee to understand what these markings signify.	1926.1424(a)(2)(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.
(iii) A danger sign, as prescribed in construction safety standard part 22 "Signals, Signs, Tags, and Barricades," as referenced in R 408.41003a, shall be affixed to the rear and sides of the house and counterweight. The additional lettering on the danger sign shall indicate that the counterweight is swinging.	CURRENT MIOSHA R 408.41024a(5)
(c) Protecting employees in the hazard area.	1926.1424(a)(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, shall ensure that the operator is informed that he or she is going to that location.	1926.1424(a)(3)(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) When the operator knows that an employee went to a location covered by subrule (1)(a), the operator shall 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.	1926.1424(a)(3)(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 pre-arranged system of communication that the employee is in a safe position.
(2) When any part of a crane or derrick is within the working radius of another crane or derrick, the controlling entity shall 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, shall institute this system.	1926.1424(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.
R 408.41023a Keeping clear of the load.	1926.1425 Keeping clear of the load.
Rule 1023a. (1) Hoisting routes that minimize the exposure of employees to hoisted loads shall be used. An employee shall not be permitted under a	1926.1425(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
suspended load.	safety.
(2) No employee shall be within the fall zone of a suspended load that is not being moved, except for employees engaged in any of the following:	1926.1425(b) while the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:
(a) Hooking, unhooking or guiding a load.	1926.1425(b)(1) Engaged in hooking, unhooking or guiding a load;
(b) Initially attaching the load to a component or structure.	1926.1425(b)(2) Engaged in the initial attachment of the load to a component or structure; or
(c) Operating a concrete hopper or concrete bucket.	1926.1425(b)(3) Operating a concrete hopper or concrete bucket.
(3) When employees are engaged in hooking, unhooking, or guiding the load, or are in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria shall be met:	1926.1425(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:
(a) The materials being hoisted shall be rigged to prevent unintentional displacement.	1926.1425(c)(1) The materials being hoisted must be rigged to prevent unintentional displacement.
(b) Hooks with self-closing latches or their equivalent shall be used. Exception: ‘‘J’’ hooks are permitted to be used for setting wooden trusses.	1926.1425(c)(2) Hooks with self-closing latches or their equivalent must be used. Exception: "J" hooks are permitted to be used for setting wooden trusses.
(c) The materials shall be rigged by a qualified rigger.	1926.1425(c)(3)The materials must be rigged by a qualified rigger.
(4) Receiving a load. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed.	1926.1425(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.
(5) During a tilt-up or tilt-down operation both of the following shall be met:	1926.1425(e) During a tilt-up or tilt-down operation:
(a) No employee shall be directly under the load.	1926.1425(e)(1) No employee must be directly under the load.
(b) 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: (i) Physically guide the load. (ii) Closely monitor and give instructions regarding the load’s movement. (iii) 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 R 408.41024a.	1926.1425(e)(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.
(6) The rotational speed of a crane, derrick, or excavation equipment shall be such that the center of the load shall not swing out beyond the radius of the point sheave in use. A tag line shall be used when rotation of the load would be hazardous.	CURRENT MIOSHA R 408.41025a(21)
R 408.41024a Free fall and controlled load lowering.	1926.1426 Free fall and controlled load lowering.
Rule 1024a. (1) Boom free fall prohibitions.	1926.1426(a) Boom free fall prohibitions.
(a) The use of equipment in which the boom is designed to free fall, live boom, shall be prohibited in each of the following circumstances:	1926.1426(a)(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.	1926.1426(a)(1)(i) An employee is in the fall zone of the boom or load.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(ii) An employee is being hoisted.	1926.1426(a)(1)(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 R 408. 41016b, 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.	1926.1426(a)(1)(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.	1926.1426(a)(1)(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.	1926.1426(a)(1)(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.	1926.1426(a)(1)(vi)Lifting operations are taking place in a refinery or tank farm.
(b) The use of equipment in which the boom is designed to free fall, live boom, is permitted only when none of the circumstances listed in subrule (1)(a) are present and either of the following applies:	1926.1426(a)(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.	1926.1426(a)(2)(i)The equipment was manufactured prior to October 31, 1984; or
(ii) The equipment is a floating crane or derrick or a land crane or derrick on a vessel or flotation device.	1926.1426(a)(2)(ii)The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.
(2) Preventing boom free fall. When the use of equipment with a boom that is designed to free fall, live boom, is prohibited, 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:	1926.1426(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:
(a) Friction drums shall have both of the following:	1926.1426(b)(1)Friction drums must have:
(i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering.	1926.1426(b)(1)(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.	1926.1426(b)(1)(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 shall have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.	1926.1426(b)(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.
(c) Neither clutches nor hydraulic motors shall be considered brake or locking devices for purposes of this standard.	1926.1426(b)(3) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart.
(d) Hydraulic boom cylinders shall have an integrally mounted holding device.	1926.1426(b)(4) Hydraulic boom cylinders must have an integrally mounted holding device.
(3) 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.	1926.1426(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.
(4) Load line free fall. In each of the following circumstances, controlled load lowering shall be required and free fall of the load line hoist shall be prohibited:	1926.1426(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:
(a) An employee is directly under the load.	1926.1426(d)(1)An employee is directly under the load.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(b) An employee is being hoisted.	1926.1426(d)(2)An employee is being hoisted.
(c) The load is directly over a power line, or over any part of the area extending the Table A, of R 408.41016b, 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 load.	1926.1426(d)(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.
(d) The load is over a shaft.	1926.1426(d)(4) The load is over a shaft.
(e) The load is over a cofferdam, except when there are no employees in the fall zone of the load.	1926.1426(d)(5) The load is over a cofferdam, except where there are no employees in the fall zone of the load.
R 408.41025a Derricks.	1926.1436 Derricks.
Rule 1025a. (1) This rule contains supplemental requirements for derricks, whether temporarily or permanently mounted. All provisions of this standard apply to derricks unless specified otherwise.	1926.1436(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 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.
(2) Operation procedures.	1926.1436(b) Operation--procedures.
(a) R 408.41019b shall apply, except for R 408.41019b(3).	1926.1436(b)(1) Section 1926.1417 (Operation) applies except for § 1926.1417(c) (Accessibility of procedures).
(b) Load chart contents. Load charts shall contain at least the following information:	1926.1436(b)(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.	1926.1436(b)(2)(i) Rated capacity at corresponding ranges of boom angle or operating radii.
(ii) Specific lengths of components to which the rated capacities apply.	1926.1436(b)(2)(ii) Specific lengths of components to which the rated capacities apply.
(iii) Required parts for hoist reeving.	1926.1436(b)(2)(iii) Required parts for hoist reeving.
(iv) Size and construction of rope, which also may be included in the operating manual.	1926.1436(b)(2)(iv) Size and construction of rope must be included on the load chart or in the operating manual.
(c) Load chart location. An employer shall ensure that a durable and legible rating chart is at the operation station for all derricks.	1926.1436(b)(3) Load chart location.
	1926.1436(b)(3)(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.
	1926.1436(b)(3)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(3) Construction.	1926.1436(c) Construction.
(a) General requirements.	1926.1436(c)(1) General requirements.
(i) Derricks shall be constructed to meet all stresses imposed on members and components when installed and operated in accordance with the manufacturer's or builder's procedures and within its rated capacity.	1926.1436(c)(1)(i) 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.
(ii) Welding of load sustaining members shall conform to recommended practices in ANSI/AWS D14.3 "Specification for Welding Earthmoving and Construction Equipment," 1994 edition, which is adopted by reference in R 408.41003a, or AWS D1.1/D1.1M "Structural Welding Code – Steel Updates Every 5 Years," 2002 edition, which is adopted by reference in R 408.41003a.	1926.1436(c)(1)(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).
(b) Guy derricks.	1926.1436(c)(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.	1926.1436(c)(2)(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 shall not be used unless the employer has the following guy information from the manufacturer or a qualified person when not available from the manufacturer:	1926.1436(c)(2)(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.	1926.1436(c)(2)(ii)(A) The number of guys.
(B) The spacing around the mast.	1926.1436(c)(2)(ii)(B) The spacing around the mast.
(C) The size, grade, and construction of rope to be used for each guy.	1926.1436(c)(2)(ii)(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 subrule (3)(b)(ii), the employer shall have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer:	1926.1436(c)(2)(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.	1926.1436(c)(2)(iii)(A) The amount of initial sag or tension.
(B) The amount of tension in guy line rope at anchor.	1926.1436(c)(2)(iii)(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.	1926.1436(c)(2)(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 shall comply with all of the following:	1926.1436(c)(2)(v) The mast cap must:
(A) Permit the mast to rotate freely.	1926.1436(c)(2)(v)(A) Permit the mast to rotate freely.
(B) Withstand tilting and cramping caused by the guy loads.	1926.1436(c)(2)(v)(B) Withstand tilting and cramping caused by the guy loads.
(C) Be secured to the mast to prevent disengagement during erection.	1926.1436(c)(2)(v)(C) Be secured to the mast to prevent disengagement during erection.
(D) Be provided with means for attaching guy ropes.	1926.1436(c)(2)(v)(D) Be provided with means for attaching guy ropes.
(c) Stiffleg derricks.	1926.1436(c)(3) Stiffleg derricks.
(i) The mast shall be supported in the vertical position by at least 2 stifflegs. One end of each stiffleg shall be connected to the top of the mast and the other end securely anchored.	1926.1436(c)(3)(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 shall be capable of withstanding the loads imposed at any	1926.1436(c)(3)(ii) The stifflegs must be capable of withstanding the loads

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
point of operation within the load chart range.	imposed at any point of operation within the load chart range.
(iii) The mast base shall comply with both of the following:	1926.1436(c)(3)(iii) The mast base must:
(A) Permit the mast to rotate freely, when necessary.	1926.1436(c)(3)(iii)(A) Permit the mast to rotate freely (when necessary).
(B) Permit deflection of the mast without binding.	1926.1436(c)(3)(iii)(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.	1926.1436(c)(3)(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 shall comply with all of the following:	1926.1436(c)(3)(v) The stiffleg connecting member at the top of the mast must:
(A) Permit the mast to rotate freely, when necessary.	1926.1436(c)(3)(v)(A) Permit the mast to rotate freely (when necessary).
(B) Withstand the loads imposed by the action of the stifflegs.	1926.1436(c)(3)(v)(B) Withstand the loads imposed by the action of the stifflegs.
(C) Be secured so as to oppose separating forces.	1926.1436(c)(3)(v)(C) Be secured so as to oppose separating forces.
(d) Gin pole derricks.	1926.1436(c)(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: When the size, spacing, or both, 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.	1926.1436(c)(4)(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 shall permit movement of the pole, when necessary.	1926.1436(c)(4)(ii) The base of the gin pole must permit movement of the pole (when necessary).
(iii) The gin pole shall be anchored at the base against horizontal forces, when such forces are present.	1926.1436(c)(4)(iii) The gin pole must be anchored at the base against horizontal forces (when such forces are present).
(e) Chicago boom derricks. The fittings for stepping the boom and for attaching the topping lift shall be arranged to comply with all of the following:	1926.1436(c)(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.	1926.1436(c)(5)(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.	1926.1436(c)(5)(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 or builder’s procedures and within its rated capacity.	1926.1436(c)(5)(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.	1926.1436(c)(5)(iv) Prevent the boom or topping lift from lifting out under tensile forces.
(4) Anchoring and guying.	1926.1436(d) Anchoring and guying.
(a) Load anchoring data developed by the manufacturer or a qualified person shall be used.	1926.1436(d)(1) Load anchoring data developed by the manufacturer or a qualified person must be used.
(b) Guy derricks.	1926.1436(d)(2) Guy derricks.
(i) The mast base shall be anchored.	1926.1436(d)(2)(i) The mast base must be anchored.
(ii) The guys shall be secured to the ground or other firm anchorage.	1926.1436(d)(2)(ii) The guys must 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	1926.1436(d)(2)(iii) The anchorage and guying must be designed to withstand maximum horizontal and vertical forces encountered when operating within

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
capacity with the particular guy slope and spacing specified for the application.	rated capacity with the particular guy slope and spacing specified for the application.
(c) Stiffleg derricks.	1926.1436(d)(3) Stiffleg derricks.
(i) The mast base and stifflegs shall be anchored.	1926.1436(d)(3)(i) The mast base and stifflegs must 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 particular stiffleg spacing and slope specified for the application.	1926.1436(d)(3)(ii) The mast base and stifflegs must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular stiffleg spacing and slope specified for the application.
(5) Swingers and hoists.	1926.1436(e) Swingers and hoists.
(a) 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.	1926.1436(e)(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.
(b) Hoists.	1926.1436(e)(2) Hoists.
(i) Base mounted drum hoists shall meet the requirements in the following sections of ASME B30.7 “Base Mounted Drum Hoists,” 2001 edition, which is adopted by reference in R 408.41003a:	1926.1436(e)(2)(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) Section 7–1.1 (‘‘Load ratings and markings’’).	1926.1436(e)(2)(i)(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’’).	1926.1436(e)(2)(i)(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’’).	1926.1436(e)(2)(i)(C) Section 7-1.3 ("Installation").
(D) Applicable terms in section 7–0.2 (‘‘Definitions’’).	1926.1436(e)(2)(i)(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 shall be met when the manufacturer has conducted this testing.	1926.1436(e)(2)(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 shall be evaluated by a qualified person to determine if a load test is necessary. If it is necessary, load testing shall be conducted in accordance with subrules (5)(b)(ii) and (5)(b)(iv).	1926.1436(e)(2)(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 must be conducted in accordance with paragraphs (e)(2)(ii) and (iv) of this section.
(iv) Load test procedure. Load tests required by subrules (5)(b)(ii) or (5)(b)(iii) shall be conducted to comply with all of the following:	1926.1436(e)(2)(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 shall be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake or brakes.	1926.1436(e)(2)(iv)(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 shall be lowered, stopped and held with the brake or brakes.	1926.1436(e)(2)(iv)(B) The test load must 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.	1926.1436(e)(2)(iv)(C) The hoist must not be used unless a competent person determines that the test has been passed.
(6) Operational aids.	1926.1436(f) Operational aids.
(a) R 408.41019a shall apply, except for R 408.41019a(4)(a), R 408.41019a(5)(a), and R 408.41019a(5)(d).	1926.1436(f)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
	devices).
(b) Boom angle aid. A boom angle indicator shall not be required. If the derrick is not equipped with a functioning boom angle indicator, the employer shall ensure that one of the following are met:	1926.1436(f)(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 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.	1926.1436(f)(2)(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, shall be used.	1926.1436(f)(2)(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.
(c) Load weight or capacity devices.	1926.1436(f)(3) Load weight/capacity devices.
(i) Derricks manufactured more than 1 year after November 8, 2010 with a maximum rated capacity over 6,000 pounds shall have at least 1 of the following: a load weighing device, a load moment or rated capacity indicator, or a load moment or rated capacity limiter. Temporary alternative measures: The weight of the load shall 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 shall be provided to the operator prior to the lift. See R 408.41019b(14) for additional requirements.	1926.1436(f)(3)(i) Derricks manufactured more than one year after November 8, 2010 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 or capacity device that is 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.	1926.1436(f)(3)(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.
(7) Post-assembly approval and testing—new or reinstalled derricks.	1926.1436(g) Post-assembly approval and testing--new or reinstalled derricks.
(a) Anchorages.	1926.1436(g)(1) Anchorages.
(i) Anchorages, including the structure to which the derrick is attached, if applicable, shall be approved by a qualified person.	1926.1436(g)(1)(i) Anchorages, including the structure to which the derrick is attached (if applicable), must be approved by a qualified person.
(ii) If a rock or hairpin anchorage is used, the qualified person shall determine if any special testing of the anchorage is needed. If so, it shall be tested accordingly.	1926.1436(g)(1)(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.
(b) 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 all of he following:	1926.1436(g)(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 or hooks through the full range of hook travel.	1926.1436(g)(2)(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.	1926.1436(g)(2)(ii) Raising and lowering the boom through the full range of boom travel.
(iii) Swinging in each direction through the full range of swing.	1926.1436(g)(2)(iii) Swinging in each direction through the full range of swing.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(iv) Actuating the anti two-block and boom hoist limit devices, if provided.	1926.1436(g)(2)(iv) Actuating the anti two-block and boom hoist limit devices (if provided).
(v) Actuating locking, limiting and indicating devices, if provided.	1926.1436(g)(2)(v) Actuating locking, limiting and indicating devices (if provided).
(c) Load test. Prior to initial use, new or reinstalled derricks shall be load tested by a competent person. The test load shall meet all of the following requirements:	1926.1436(g)(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 shall be at least 100% and no more than 110% of the rated capacity, unless otherwise recommended by the manufacturer or qualified person. The test load shall not be less than the maximum anticipated load.	1926.1436(g)(3)(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 shall consist of all of the following:	1926.1436(g)(3)(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 or brakes.	1926.1436(g)(3)(ii)(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).
(B) Swinging the derrick, if applicable, the full range of its swing, at the maximum allowable working radius for the test load.	1926.1436(g)(3)(ii)(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.	1926.1436(g)(3)(ii)(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 or brakes.	1926.1436(g)(3)(ii)(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.	1926.1436(g)(3)(iii) The derrick must not be used unless the competent person determines that the test has been passed.
(d) 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 retested or dismantled, whichever occurs first. All of these documents shall be available, during the applicable document retention period, to all persons who conduct inspections in accordance with R 408.41012a.	1926.1436(g)(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.
(8) 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 a load test is needed, it be conducted and documented in accordance with subrule (7).	1926.1436(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.
(9) [Reserved.]	1926.1436(i) [Reserved.]
(10) Power failure procedures. If power fails during operations, the derrick operator shall safely stop operations, which shall include all of the following:	1926.1436(j) Power failure procedures. If power fails during operations, the derrick operator must safely stop operations. This must include:
(a) Setting all brakes or locking devices.	1926.1436(j)(1) Setting all brakes or locking devices.
(b) Moving all clutch and other power controls to the off position.	1926.1436(j)(2) Moving all clutch and other power controls to the off position.
(11) Use of winch heads.	1926.1436(k) Use of winch heads.
(a) Ropes shall not be handled on a winch head without the knowledge of the operator.	1926.1436(k)(1) 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 shall be within reach of the power unit control lever.	1926.1436(k)(2) While a winch head is being used, the operator must be within reach of the power unit control lever.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(12) [Reserved.]	1926.1436(l) [Reserved.]
(13) Securing the boom.	1926.1436(m) Securing the boom.
(a) When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanisms on the boom hoist shall be engaged.	1926.1436(m)(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.
(b) When taken out of service for 30 days or more, the boom shall be secured by one of the following methods:	1926.1436(m)(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.	1926.1436(m)(2)(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.	1926.1436(m)(2)(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.	1926.1436(m)(2)(iii) For guy derricks, lifted to a vertical position and secured to the mast.
(iv) For stiffleg derricks, secured against the stiffleg.	1926.1436(m)(2)(iv) For stiffleg derricks, secured against the stiffleg.
(14) The process of jumping the derrick shall be supervised by the A/D director.	1926.1436(n) The process of jumping the derrick must be supervised by the A/D director.
(15) Derrick operations shall be supervised by a competent person.	1926.1436(o) Derrick operations must be supervised by a competent person.
(16) Inspections. In addition to the requirements in R 408.41012a, the following additional items shall be included in the inspections:	1926.1436(p) Inspections. In addition to the requirements in § 1926.1412, the following additional items must be included in the inspections:
(a) Daily: Guys for proper tension.	1926.1436(p)(1) Daily: Guys for proper tension.
(b) Annual.	1926.1436(p)(2) Annual.
(i) Gudgeon pin for cracks, wear, and distortion.	1926.1436(p)(2)(i) Gudgeon pin for cracks, wear, and distortion.
(ii) Foundation supports for continued ability to sustain the imposed loads.	1926.1436(p)(2)(ii) Foundation supports for continued ability to sustain the imposed loads.
(17) Qualification and Training. The employer shall train each operator of a derrick on the safe operation of equipment the individual will operate. R 408.41008a of this standard shall not apply.	1926.1436(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.
R 408.41025b Base-mounted drum hoists	
Rule 1025b (a) Exposed moving parts on base mounted hoists, such as gears, projecting screws, setscrews, chain, cables, chain sprockets, and reciprocating or rotating parts, shall be guarded.	CURRENT MIOSHA R 408.41077a(1)
(b) All controls used during the normal operating cycle shall be located within easy reach of the operator's station. Electric motor-operated hoists shall have a means to stop remotely operated hoists if the controls are ineffective.	CURRENT MIOSHA R 408.41077a(2)
(c) Electric motor-operated hoists shall be equipped with both of the following items:	CURRENT MIOSHA R 408.41077a(3)
(i) A device that will disconnect all motors from the line upon power failure and that will not permit any motor to be restarted until the controller handle is brought to the "off" position.	CURRENT MIOSHA R 408.41077a(3)(a)
(ii) Where applicable, an overspeed-prevention device.	CURRENT MIOSHA R 408.41077a(3)(b)
(d) All base-mounted drum hoists shall comply with R 408.41025a(5)(b)(i).	CURRENT MIOSHA R 408.41077a(4)

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
R 408.41026a Supplemental requirements for multiple-crane or derrick lifts.	1926.1432 Multiple-crane/derrick lifts—supplemental requirements.
Rule 1026a. (1) Plan development. Before beginning a crane or derrick operation in which more than 1 crane or derrick will be supporting the load, the operation shall be planned. The planning shall meet all of the following requirements:	1926.1432(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:
(a) Be developed by a qualified person.	1926.1432(a)(1) The plan must be developed by a qualified person.
(b) Be designed to ensure that the requirements of this standard are met.	1926.1432(a)(2) The plan must be designed to ensure that the requirements of this subpart are met.
(c) When the qualified person determines that engineering expertise is needed for the planning, the employer shall ensure that it is provided.	1926.1432(a)(3) Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided.
(2) Plan implementation.	1926.1432(b) Plan implementation.
(a) The multiple-crane or derrick lift shall be directed by a lift director who meets the criteria for both a competent person and a qualified person, or a competent person who is assisted by one or more qualified persons.	1926.1432(b)(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).
(b) The lift director shall review the plan in a meeting with all workers who will be involved with the operation.	1926.1432(b)(2) The lift director must review the plan in a meeting with all workers who will be involved with the operation.
R 408.41027a Design, construction, and testing.	1926.1433 Design, construction and testing.
Rule 1027a. The following requirements apply to equipment that has a manufacturer-rated hoisting or 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.
(1) Mobile cranes, including crawler and truck, and locomotive cranes manufactured prior to November 8, 2010 shall meet at least one of the following the applicable requirements for design, construction, and testing: (a) ANSI/ASME B30.5 “Mobile and Locomotive Cranes,” 1994 edition, which is adopted by reference in R 408.41003a, (b) PCSA Standard No. 4 “Mobile Power Crane and Excavator and Hydraulic Crane Standards,” 1983 edition, which is adopted by reference in R 408.41003a. (c) The requirements in subrule (2). (d) The applicable DIN standards that were in effect at the time of manufacture.	1926.1433(a) Crawler, truck and locomotive cranes manufactured prior to November 8, 2010 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.
(2) Mobile cranes, including crawler and truck, and locomotive cranes manufactured on or after November 8, 2010 shall meet the following portions of ANSI/ASME B30.5 “Mobile and Locomotive Cranes,” 2004 edition, which is adopted by reference in R 408.41003a, as applicable:	1926.1433(b) Mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the following portions of ASME B30.5-2004 (incorporated by reference, see § 1926.6) as applicable:
(a) In section 5–1.1.1 (‘‘Load Ratings—Where Stability Governs Lifting Performance’’), paragraphs (a)—(d) (including subparagraphs).	1926.1433(b)(1) In section 5-1.1.1 ("Load Ratings--Where Stability Governs Lifting Performance"), paragraphs (a)--(d) (including subparagraphs).
(b) In section 5–1.1.2 (‘‘Load Ratings—Where Structural Competence Governs Lifting Performance’’), paragraph (b).	1926.1433(b)(2) In section 5-1.1.2 ("Load Ratings--Where Structural Competence Governs Lifting Performance"), paragraph (b).

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(c) Section 5–1.2 (‘‘Stability (Backward and Forward)’’).	1926.1433(b)(3) Section 5-1.2 ("Stability (Backward and Forward)").
(d) In section 5–1.3.1 (‘‘Boom Hoist Mechanism’’), paragraphs (a), (b)(1) and (b)(2), except that when using rotation resistant rope, R 408.41014a(5)(d)(ii) applies.	1926.1433(b)(4) In section 5-1.3.1 ("Boom Hoist Mechanism"), paragraphs (a), (b)(1) and (b)(2), except that when using rotation resistant rope, § 1926.1414(c)(4)(ii)(A) applies.
(e) 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).	1926.1433(b)(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).
(f) Section 5–1.3.3 (‘‘Telescoping Boom’’).	1926.1433(b)(6) Section 5-1.3.3 ("Telescoping Boom").
(g) Section 5–1.4 (‘‘Swing Mechanism’’).	1926.1433(b)(7) Section 5-1.4 ("Swing Mechanism").
(h) In section 5–1.5 (‘‘Crane Travel’’), all provisions except 5–1.5.3(d).	1926.1433(b)(8) In section 5-1.5 ("Crane Travel"), all provisions except 5-1.5.3(d).
(i) In section 5–1.6 (‘‘Controls’’), all provisions except 5–1.6.1 (c).	1926.1433(b)(9) In section 5-1.6 ("Controls"), all provisions except 5-1.6.1 (c).
(j) Section 5–1.7.4 (‘‘Sheaves’’).	1926.1433(b)(10) Section 5-1.7.4 ("Sheaves").
(k) Section 5–1.7.5 (‘‘Sheave sizes’’).	1926.1433(b)(11) Section 5-1.7.5 ("Sheave sizes").
(l) In section 5–1.9.1 (‘‘Booms’’), paragraph (f).	1926.1433(b)(12) In section 5-1.9.1 ("Booms"), paragraph (f).
(m) Section 5–1.9.3 (‘‘Outriggers’’).	1926.1433(b)(13) Section 5-1.9.3 ("Outriggers").
(n) Section 5–1.9.4 (‘‘Locomotive Crane Equipment’’).	1926.1433(b)(14) Section 5-1.9.4 ("Locomotive Crane Equipment").
(o) Section 5–1.9.7 (‘‘Clutch and Brake Protection’’).	1926.1433(b)(15) Section 5-1.9.7 ("Clutch and Brake Protection").
(p) In section 5–1.9.11 (‘‘Miscellaneous equipment’’), paragraphs (a), (c), (e), and (f).	1926.1433(b)(16) In section 5-1.9.11 ("Miscellaneous equipment"), paragraphs (a), (c), (e), and (f).
(3) Prototype testing: mobile cranes, including crawler and truck, and locomotive cranes manufactured on or after November 8, 2010 shall meet the prototype testing requirements in Test Option A or Test Option B of this rule. Tower cranes manufactured on or after November 8, 2010 shall meet the prototype testing requirements in British European Standards BS EN 14439 “Cranes – Safety – Tower Cranes,” 2006 edition, which is adopted by reference in R 408.41003a. Note: Prototype testing of crawler, locomotive and truck cranes manufactured prior to November 8, 2010 shall conform to subrule (3)(a).	1926.1433(c) Prototype testing: mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the prototype testing requirements in Test Option A or Test Option B of this section. Tower cranes manufactured on or after November 8, 2010 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 November 8, 2010 must conform to paragraph (a) of this section.
(a) Test Option A.	
(i) The following shall apply to equipment with cantilevered booms, such as hydraulic boom cranes: All the tests listed in SAE J1063 “Cantilevered Boom Crane Structures – Method of Test,” November 1993 edition Table 1, which is adopted by reference in R 408.41003a, shall be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J1063 “Cantilevered Boom Crane Structures – Method of Test,” November 1993 edition Table 2, which is adopted by reference in R 408.41003a, shall be met.	1926.1433(c)(1)(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 Sec. 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 “Lattice Boom Cranes – Method of Test,” June 2003 Table 1, which is adopted by reference in R 408.41003a, shall be performed to load all critical structural elements to their respective limits. All	1926.1433(c)(1)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
the strength margins listed in SAE J987 “Lattice Boom Cranes – Method of Test,” June 2003 Table 2, which is adopted by reference in R 408.41003a, shall be met.	SAE J987 (Jun. 2003) Table 2 (incorporated by reference, see § 1926.6) must be met.
(b) Test Option B. The testing and verification requirements of BS EN 13000 “Cranes – Mobile Cranes,” 2004 edition, which is adopted by reference in R 408.41003a, shall be met. In applying BS EN 13000 “Cranes – Mobile Cranes,” 2004 edition, all of the following additional requirements shall be met:	1926.1433(c)(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 shall apply to equipment with cantilevered booms, such as hydraulic boom cranes: The analysis methodology, computer modeling, shall demonstrate that all load cases listed in SAE J1063 “Cantilevered Boom Crane Structures – Method of Test,” November 1993 edition, which is adopted by reference in R 408.41003a, meet the strength margins listed in SAE J1063 “Cantilevered Boom Crane Structures – Method of Test,” November 1993 edition Table 2.	1926.1433(c)(2)(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 shall apply to equipment with pendant supported lattice booms: The analysis methodology, computer modeling, shall demonstrate that all load cases listed in SAE J987 “Lattice Boom Cranes – Method of Test,” June 2003 edition, which is adopted by reference in R 408.41003a, meet the strength margins listed in SAE J987 “Lattice Boom Cranes – Method of Test,” June 2003 Table 2.	1926.1433(c)(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 (Jun. 2003) Table 2.
(iii) Analysis verification. The physical testing requirements under SAE J1063 “Cantilevered Boom Crane Structures – Method of Test,” November 1993 edition, which is adopted by reference in R 408.41003a, and SAE J987 “Lattice Boom Cranes – Method of Test,” June 2003 edition, which is adopted by reference in R 408.41003a, shall 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.	1926.1433(c)(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.
(4) All equipment covered by this standard shall meet all of the following requirements:	1926.1433(d) All equipment covered by this subpart must meet the following requirements:
(a) Rated capacity and related information. The information available in the cab, as specified in R 408.41019b(3), regarding ‘‘rated capacity’’ and related information shall include, at a minimum, the following information:	1926.1433(d)(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:	1926.1433(d)(1)(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.	1926.1433(d)(1)(i)(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.	1926.1433(d)(1)(i)(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 ANSI/ASME B30.5 “Mobile and	1926.1433(d)(1)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
Locomotive Cranes," 2004 edition, section 5–1.1.3, Figure 11.	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.	1926.1433(d)(1)(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 shall be shown.	1926.1433(d)(1)(iv) Recommended reeving for the hoist lines must be shown.
(v) Recommended parts of hoist reeving, size, and type of wire rope for various equipment loads.	1926.1433(d)(1)(v) Recommended parts of hoist reeving, size, and type of wire rope for various equipment loads.
(vi) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope.	1926.1433(d)(1)(vi) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope.
(vii) Tire pressure, where applicable.	1926.1433(d)(1)(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.	1926.1433(d)(1)(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.	1926.1433(d)(1)(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.	1926.1433(d)(1)(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.	1926.1433(d)(1)(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.	1926.1433(d)(1)(xii) The maximum telescopic travel length of each boom telescopic section.
(xiii) Whether sections are telescoped manually or with power.	1926.1433(d)(1)(xiii) Whether sections are telescoped manually or with power.
(xiv) The sequence and procedure for extending and retracting the telescopic boom section.	1926.1433(d)(1)(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.	1926.1433(d)(1)(xv) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions.
(xvi) Hydraulic relief valve settings specified by the manufacturer.	1926.1433(d)(1)(xvi) Hydraulic relief valve settings specified by the manufacturer.
(b) 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.	1926.1433(d)(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.
(c) Hook and ball assemblies and load blocks shall be marked with their rated capacity and weight.	1926.1433(d)(3) Hook and ball assemblies and load blocks must be marked with their rated capacity and weight.
(d) Latching hooks.	1926.1433(d)(4) Latching hooks.
(i) Hooks shall be equipped with latches, except where the requirements of subrule (3)(d)(ii) are met.	1926.1433(d)(4)(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, shall not be used unless both of the following occur:	1926.1433(d)(4)(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 or tied-back.	1926.1433(d)(4)(ii)(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 preplanned 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.	1926.1433(d)(4)(ii)(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	1926.1433(d)(4)(iii) The latch must close the throat opening and be designed

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
or other lifting devices or accessories in the hook when the rigging apparatus is slack.	to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.
(e) Posted warnings. Posted warnings required by this standard as well as those originally supplied with the equipment by the manufacturer shall be maintained in legible condition.	1926.1433(d)(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.
(f) An accessible fire extinguisher shall be on the equipment.	1926.1433(d)(6) An accessible fire extinguisher must be on the equipment.
(g) Cabs. Equipment with cabs shall meet all of the following requirements:	1926.1433(d)(7) Cabs. Equipment with cabs must meet the following 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 to prevent windshield icing, defroster, fan, windshield wiper.	1926.1433(d)(7)(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) Swinging or sliding cab doors 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.	1926.1433(d)(7)(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.	1926.1433(d)(7)(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.	1926.1433(d)(7)(iii)(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 shall be designed so that they can be secured to prevent inadvertent closure.	1926.1433(d)(7)(iii)(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 shall be made 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.	1926.1433(d)(7)(iii)(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 shall be provided from the operator’s station to an exit door on the operator’s side.	1926.1433(d)(7)(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 shall be capable of supporting 250 pounds without permanent distortion.	1926.1433(d)(7)(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.
(h) 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.	1926.1433(d)(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.
(i) 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.	1926.1433(d)(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.
(j) Hydraulic and pneumatic lines shall be protected from damage to the extent feasible.	1926.1433(d)(10) Hydraulic and pneumatic lines must be protected from damage to the extent feasible.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(k) 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.	1926.1433(d)(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.
(l) Friction mechanisms. When friction mechanisms, such as brakes and clutches, are used to control the boom hoist or load line hoist, they shall comply with both of the following:	1926.1433(d)(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) Be of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving.	1926.1433(d)(12)(i) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving.
(ii) Be adjustable to permit compensation for lining wear to maintain proper operation.	1926.1433(d)(12)(ii) Adjustable to permit compensation for lining wear to maintain proper operation.
(m) Hydraulic load hoists. Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent load hoist movement in the event of hydraulic failure.	1926.1433(d)(13) Hydraulic load hoists. Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent load hoist movement in the event of hydraulic failure.
(5) The employer's obligations under subrules (1) to (3) and (4)(g) to (4)(m) are met when the equipment has not changed, except in accordance with R 408.41028a, and when an employer can refer to documentation from the manufacturer showing that the equipment has been designed, constructed and tested in accordance with those subrules.	1926.1433(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.
R 408.41028a Equipment modifications.	1926.1434 Equipment modifications.
Rule 1028a. (1) Modifications or additions which affect the capacity or safe operation of the equipment shall be prohibited except when the requirements of subrules (1)(a), (1)(b), (1)(c), (1)(d), or (1)(e) are met.	1926.1434(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.
(a) Manufacturer review and approval.	1926.1434(a)(1) Manufacturer review and approval.
(i) The manufacturer shall approve the modifications or additions in writing.	1926.1434(a)(1)(i) The manufacturer approves the modifications/additions in writing.
(ii) The load charts, procedures, instruction manuals and instruction plates, tags, or decals shall be modified as necessary to reflect the modification or addition.	1926.1434(a)(1)(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 shall not be reduced.	1926.1434(a)(1)(iii) The original safety factor of the equipment is not reduced.
(b) Manufacturer refusal to review request. The manufacturer shall be provided a detailed description of the proposed modification or addition, and shall be asked to approve the modification or addition. If a manufacturer declines to review the technical merits of the proposal or fails to acknowledge or initiate the review of the request within 30 days, all of the following shall be met:	1926.1434(a)(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 shall do both of the following:	1926.1434(a)(2)(i) A registered professional engineer who is a qualified person with respect to the equipment involved:
(A) Approve the modification or addition and specify the equipment configurations to which that approval applies.	1926.1434(a)(2)(i)(A) Approves the modification/addition and specifies the equipment configurations to which that approval applies, and
(B) Modify load charts, procedures, instruction manuals and instruction plates, tags, or decals as necessary to reflect the modification or addition.	1926.1434(a)(2)(i)(B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
	modification/addition.
(ii) The original safety factor of the equipment shall not be reduced.	1926.1434(a)(2)(ii) The original safety factor of the equipment is not reduced.
(c) Unavailable manufacturer. If the manufacturer is unavailable and the requirements of subrules (1)(b)(i) and (ii) shall be met.	1926.1434(a)(3) Unavailable manufacturer. The manufacturer is unavailable and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.
(d) Manufacturer does not complete the review within 120 days of the request. The manufacturer shall be provided a detailed description of the proposed modification or addition and shall be asked to approve the modification or addition. If the manufacturer agreed to review the technical merits of the proposal, but failed to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification or addition, then the requirements of subrules (1)(b)(i) and (ii) shall be met.	1926.1434(a)(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.
(e) Multiple manufacturers of equipment designed for use on marine work sites. If the equipment is designed for marine work sites or contains major structural components from more than one manufacturer, then the requirements of subrules (1)(b)(i) and (ii) shall be met.	1926.1434(a)(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.
(2) Modifications or additions which affect the capacity or safe operation of the equipment shall be prohibited when the manufacturer, after a review of the technical safety merits of the proposed modification or 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 treat this as a manufacturer refusal to review the request under subrule (1)(b).	1926.1434(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 treat this as a manufacturer refusal to review the request under paragraph (a)(2) of this section.
	1926.1434(c) The provisions in paragraphs (a) and (b) of this section do not apply to modifications made or approved by the U.S. military.
R 408.41029a Tower cranes.	1926.1435 Tower cranes.
Rule 1029a. (1) This rule contains supplemental requirements for tower cranes. All rules of this standard apply to tower cranes unless specified otherwise.	1926.1435(a) This section contains supplemental requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise.
(2) Erecting, climbing and dismantling.	1926.1435(b) Erecting, climbing and dismantling.
(a) R 408.41015a shall apply to tower cranes except as otherwise specified. The term ‘‘assembly/disassembly’’ shall be replaced by ‘‘erecting, climbing and dismantling,’’ and the term ‘‘disassembly’’ shall be replaced by ‘‘dismantling’’ when applying R 408.41015a to tower cranes.	1926.1435(b)(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."

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(b) Dangerous areas, self-erecting tower cranes. In addition to the requirements in R 408.41015a(2)(e) for self-erecting tower cranes, employees shall 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 locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise. Then, only the necessary personnel shall be permitted in this area.	1926.1435(b)(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 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.
(c) 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, shall be designed by the manufacturer or a registered professional engineer.	1926.1435(b)(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.
(d) Addressing specific hazards. The requirements in R 408.41015a(2)(h)(i) to (ix) shall apply. In addition, the A/D director shall address all of the following:	1926.1435(b)(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 shall determine that tower crane foundations and structural supports are installed in accordance with their design.	1926.1435(b)(4)(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 shall be maintained.	1926.1435(b)(4)(ii)Loss of backward stability. Backward stability before swinging self erecting cranes or cranes on traveling or static undercarriages.
(iii) Wind speed. Wind shall not exceed the speed recommended by the manufacturer. When manufacturer does not specify this information, the speed shall be determined by a qualified person.	1926.1435(b)(4)(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.
(e) Plumb tolerance. Towers shall be erected plumb to the manufacturer's tolerance and verified by a qualified person. When 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.	1926.1435(b)(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).
(f) Multiple tower crane jobsites. On jobsites where more than one fixed jib (hammerhead) tower crane is installed, the cranes shall be located so that no crane can come in contact with the structure of another crane. Cranes are permitted to pass over one another.	1926.1435(b)(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.
(g) Climbing procedures. Prior to, and during, all climbing procedures, including inside climbing and top climbing, the employer shall do both of the following:	1926.1435(b)(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.	1926.1435(b)(7)(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.	1926.1435(b)(7)(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.
(h) Counterweight or ballast.	1926.1435(b)(8) Counterweight/ballast.
(i) Equipment shall not be erected, dismantled or operated without the amount and position of counterweight, ballast, or both in place as specified by the manufacturer or a registered professional engineer familiar with the equipment.	1926.1435(b)(8)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(ii) The maximum counterweight, ballast, or both specified by the manufacturer or registered professional engineer familiar with the equipment shall not be exceeded.	1926.1435(b)(8)(ii)The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment must not be exceeded.
(3) Signs. The size and location of signs on tower cranes shall be installed as specified by the manufacturer. When these specifications are unavailable, a registered professional engineer familiar with the type of equipment involved shall approve in writing the size and location of any signs.	1926.1435(c) Signs. The size and location of signs installed on tower 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.
(4) Safety devices.	1926.1435(d) Safety devices.
(a) R 408.41018a shall not apply to tower cranes.	1926.1435(d)(1)Section 1926.1415 does not apply to tower cranes.
(b) All of the following safety devices are required on all tower cranes unless otherwise specified:	1926.1435(d)(2)The following safety devices are required on all tower cranes unless otherwise specified:
(i) Boom stops on luffing boom type tower cranes.	1926.1435(d)(2)(i)Boom stops on luffing boom type tower cranes.
(ii) Jib stops on luffing boom type tower cranes, if equipped with a jib attachment.	1926.1435(d)(2)(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.	1926.1435(d)(2)(iii)Travel rail end stops at both ends of travel rail.
(iv) Travel rail clamps on all travel bogies.	1926.1435(d)(2)(iv) Travel rail clamps on all travel bogies.
(v) Integrally mounted check valves on all load supporting hydraulic cylinders.	1926.1435(d)(2)(v) Integrally mounted check valves on all load supporting hydraulic cylinders.
(vi) A hydraulic system pressure limiting device.	1926.1435(d)(2)(vi)Hydraulic system pressure limiting device.
(vii) All of the following brakes, which automatically set in the event of pressure loss or power failure, shall be required:	1926.1435(d)(2)(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.	1926.1435(d)(2)(vii)(A) A hoist brake on all hoists.
(B) Swing brake.	1926.1435(d)(2)(vii)(B) Swing brake.
(C) Trolley brake.	1926.1435(d)(2)(vii)(C) Trolley brake.
(D) Rail travel brake.	1926.1435(d)(2)(vii)(D) Rail travel brake.
(viii) Deadman control or forced neutral return control, hand, levers.	1926.1435(d)(2)(viii) Deadman control or forced neutral return control (hand) levers.
(ix) Emergency stop switch at the operator’s station.	1926.1435(d)(2)(ix) Emergency stop switch at the operator's station.
(x) Trolley end stops shall be provided at both ends of travel of the trolley.	1926.1435(d)(2)(x) Trolley end stops must be provided at both ends of travel of the trolley.
(c) Proper operation required. Operations shall not begin unless the devices listed in this rule are in proper working order. If a device stops working properly during operations, the operator shall safely stop operations. The equipment shall be taken out of service, and operations shall not resume until the device is again working properly. See R 408.41019b(5). Alternative measures shall not be used.	1926.1435(d)(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 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.
(5) Before leaving a hammerhead tower crane unattended, the operator shall, in addition to the requirements specified in R 408.41019b(4), do all of the following:	CURRENT MIOSHA R 408.41028a(1)
(a) Set the trolley brakes and other locking devices and bring the hook block to its highest position.	CURRENT MIOSHA R 408.41028a(1)(a)
(b) Secure the crane to prevent accidental travel.	CURRENT MIOSHA R 408.41028a(1)(b)

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(c) Set rail clamps, where provided.	CURRENT MIOSHA R 408.41028a(1)(c)
(d) Release the swing brake to allow weathervaning, unless a 360-degree rotation is not possible. When restraining a crane from swinging freely, the manufacturer's recommendations shall be followed.	CURRENT MIOSHA R 408.41028a(1)(d)
(6) Before leaving a portal, tower, or pillar crane unattended, the operator shall, in addition to the requirements specified in R 408.41019b(4), do all of the following:	CURRENT MIOSHA R 408.41029a(1)
(a) Lower the boom to the boom rest or otherwise fasten it securely to prevent displacement due to wind loads or other outside forces, unless this is contrary to the manufacturer's recommendations.	CURRENT MIOSHA R 408.41029a(1)(a)
(b) Set the brakes and other locking devices and bring the hook block to its highest position.	CURRENT MIOSHA R 408.41029a(1)(b)
(c) Secure the crane to prevent accidental travel.	CURRENT MIOSHA R 408.41029a(1)(c)
(d) Set rail clamps, where provided.	CURRENT MIOSHA R 408.41029a(1)(d)
(7) Operational aids.	1926.1435(e) Operational aids.
(a) R 408.41019a shall not apply to tower cranes.	1926.1435(e)(1)Section 1926.1416 does not apply to tower cranes.
(b) The devices listed in this subrule shall be required on all tower cranes covered by this standard, unless otherwise specified.	1926.1435(e)(2)The devices listed in this section ("operational aids") are required on all tower cranes covered by this subpart, unless otherwise specified.
(c) Operations shall not begin unless the operational aids are in proper working order, except when the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, shall be followed. See R 408.41019b(5) for additional requirements.	1926.1435(e)(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.
(d) 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 shall be permitted and shall not be considered a modification under R 408.41028a.	1926.1435(e)(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.
(e) Category I operational aids and alternative measures. Operational aids listed in this subrule that are not working properly shall 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 shall be completed within 7 calendar days of receipt of the parts.	1926.1435(e)(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 shall be restricted at both ends of the jib by a trolley travel limiting device to prevent the trolley from running into the trolley end stops. Temporary alternative measures shall comply with either of the following:	1926.1435(e)(5)(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 trolley end stops. Temporary alternative measures:
(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.	1926.1435(e)(5)(i)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(B) A spotter who is in direct communication with the operator shall be used when operations are conducted within 10 feet of the outer or inner trolley end stops.	1926.1435(e)(5)(i)(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 shall be limited at the minimum and maximum radius. Temporary alternative measures shall comply with either of the following: (A) 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. (B) Use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	1926.1435(e)(5)(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 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 or devices shall prevent this damage at all points where two-blocking could occur. Temporary alternative measures shall comply with either of the following: (A) 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. (B) Use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	1926.1435(e)(5)(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 November 8, 2011, shall be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum. Temporary alternative measures shall comply with either of the following: (A) 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. (B) Use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	1926.1435(e)(5)(iv) Hoist drum lower limiting device. Tower cranes manufactured after November 8, 2011 must 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 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 shall comply with either of the following: (A) A radius indicating device shall be used. (B) 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 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 shall be provided to the operator prior to the lift.	1926.1435(e)(5)(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 shall be limited to	1926.1435(e)(5)(vi)Hoist line pull limiting device. The capacity of the hoist must

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. Temporary alternative measure: 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.	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 shall be limited to prevent the travel bogies from running into the end stops or buffers. Temporary alternative measure: A spotter who is in direct communication with the operator shall be used when operations are conducted within 10 feet of either end of the travel rail end stops. The spotter shall inform the operator of the distance of the travel bogies from the end stops or buffers.	1926.1435(e)(5)(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 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 shall be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. Temporary alternative measure: The device shall be manually set when required if an electric, hydraulic or automatic control is not functioning.	1926.1435(e)(5)(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.
(f) Category II operational aids and alternative measures. Operational aids listed in this subrule that are not working properly shall 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 shall be completed within 7 calendar days of receipt of the parts.	1926.1435(e)(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.	1926.1435(e)(6)(i)Boom angle or hook radius indicator.
(A) Luffing boom tower cranes shall have a boom angle indicator readable from the operator’s station.	1926.1435(e)(6)(i)(A)Luffing boom tower cranes must have a boom angle indicator readable from the operator's station.
(B) Hammerhead tower cranes manufactured after November 8, 2011 shall have a hook radius indicator readable from the operator’s station.	1926.1435(e)(6)(i)(B) Hammerhead tower cranes manufactured after November 8, 2011 must have a hook radius indicator readable from the operator's station.
(C) Temporary alternative measure: Hook radii or boom angle shall be determined by measuring the hook radii or boom angle with a measuring device.	1926.1435(e)(6)(i)(C) 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 the end limit in both directions. Temporary alternative measure: The employer shall 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.	1926.1435(e)(6)(ii) Trolley travel deceleration device. The trolley speed must be automatically reduced prior to the trolley reaching 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 shall be automatically reduced prior to the boom reaching the minimum or maximum radius limit. Temporary alternative measure: The employer shall 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	1926.1435(e)(6)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
boom speed when approaching the minimum or maximum radius limits.	reduce the boom speed when approaching the minimum or maximum radius 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 employer shall 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.	1926.1435(e)(6)(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 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 shall comply with either of the following: (A) Use of wind speed information from a properly functioning indicating device on another tower crane on the same site. (B) A qualified person estimates the wind speed.	1926.1435(e)(6)(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 November 8, 2011 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 measure: The weight of the load shall 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 shall be provided to the operator prior to the lift.	1926.1435(e)(6)(vi)Load indicating device. Cranes manufactured after November 8, 2011 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 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.
(8) Inspections.	1926.1435(f) Inspections.
(a) R 408.41012a shall apply to tower cranes, except that the term ''assembly'' is replaced by ''erection.'' R 408.41013a shall apply to tower cranes.	1926.1435(f)(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.
(b) Pre-erection inspection. Before each crane component is erected, it shall be inspected by a qualified person for damage or excessive wear.	1926.1435(f)(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 shall pay particular attention to components that will be difficult to inspect thoroughly during shift inspections.	1926.1435(f)(2)(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 shall not be erected on the crane unless it is repaired and, upon reinspection by the qualified person, found to no longer create a safety hazard.	1926.1435(f)(2)(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 reinspection by the qualified person, found to no longer create a safety hazard.
(iii) If the qualified person determines that the component, though not presently a safety hazard, needs to be monitored, the employer shall ensure that the component is checked in the monthly inspections. Any such determination shall be documented, and the documentation shall be available	1926.1435(f)(2)(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 must be documented, and the documentation must be available

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
to any individual who conducts a monthly inspection.	to any individual who conducts a monthly inspection.
(c) Post-erection inspection. In addition to the requirements in R 408.41012(4), the following requirements shall be met:	1926.1435(f)(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, shall be conducted after each erection.	1926.1435(f)(3)(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 shall be conducted according to the manufacturer's instructions when available. When these instructions are unavailable, the test shall be conducted according to written load test procedures developed by a registered professional engineer familiar with the type of equipment involved.	1926.1435(f)(3)(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.
(d) Monthly. The following additional items shall be included:	1926.1435(f)(4) Monthly. The following additional items must be included:
(i) All tower, mast, and other structural bolts, in 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.	1926.1435(f)(4)(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.	1926.1435(f)(4)(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.
(e) Annual. In addition to the items that shall be inspected under R 408.41012(7), all turntable and tower bolts shall be inspected for proper condition and torque.	1926.1435(f)(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.
R 408.41030a Overhead and gantry cranes.	1926.1438 Overhead and gantry cranes
Rule 1030a. (1) Overhead and gantry cranes used in construction. All overhead and gantry cranes in use shall comply with the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in general industry safety standard part 18 "Overhead and Gantry Cranes, as referenced in R 408.41003a, and shall comply with the requirements of R 408.41008a.	1926.1438(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.
(2) Overhead and gantry cranes that are not permanently installed in a facility.	1926.1438(b) Overhead and gantry cranes that are not permanently installed in a facility.
(a) This subrule shall apply to the following equipment when used in construction and not permanently installed in a facility: overhead and gantry cranes, overhead and 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.	1926.1438(b)(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.
(b) The following requirements shall apply to equipment identified in subrule (2)(a):	1926.1438(b)(2) The following requirements apply to equipment identified in paragraph (b)(1) of this section:
(i) Rules 408.41001a, 408.41004a, 408.41005a, 408.41008a through 408.41017a, 408.41019b through 408.41021b, 408.41022a, 408.41023a, 408.41024a(4), 408.41025b, 408.41026a through 408.41028a, 408.41031a, 408.41032a, and 408.41034a.	1926.1438(b)(2)(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.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(ii) The following portions of general industry safety standard part 18 “Overhead and Gantry Cranes, as referenced in R 408.41003a:	1926.1438(b)(2)(ii) The following portions of § 1910.179:
(A) Rules 408.11821(5), 408.11822(1), 408.11822(3) 408.11822(4), 408.11824(10), 408.11827(1), 408.11832(1), 408.11833(3), 408.11843(13), 408.11855(4), 408.11861(1)(b), 408.11865(2)(b), 408.11872(1), and 408.11873(1).	1926.1438(b)(2)(ii)(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 general industry safety standard part 18 “Overhead and Gantry Cranes, as referenced in R 408.41003a, except for "hoist" and "load." For those words, the definitions in this standard shall apply.	1926.1438(b)(2)(ii)(B) The definitions in § 1910.179(a) except for "hoist" and "load." For those words, the definitions in § 1926.1401 apply.
(C) Rule 408.11821(3), but only when the equipment identified in subrule (2)(a) was manufactured before September 19, 2001.	1926.1438(b)(2)(ii)(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 “Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist),” 2005 edition, which is adopted by reference in R 408.41003a, shall 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 shall apply, except in 2–3.5.1(b), ‘‘29 CFR 1910.147’’ is substituted for ‘‘ANSI Z244.1.’’	1926.1438(b)(2)(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."
R 408.41031a Floating and land cranes or derricks on barges.	1926.1437 Floating cranes/derricks and land cranes/derricks on barges.
Rule 1031a. (1) This rule contains supplemental requirements for floating cranes or derricks and land cranes or derricks on barges, pontoons, vessels or other means of flotation device. The rules of this standard shall apply to floating cranes or derricks and land cranes or derricks on barges, pontoons, vessels or other means of flotation, unless specified otherwise. The requirements of this rule shall 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.	1926.1437(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.
(2) General requirements. The requirements in subrules (3) to (11) shall apply to both floating cranes or derricks and land cranes or derricks on barges, pontoons, vessels or other means of flotation.	1926.1437(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.
(3) An operator shall not leave a floating crane or derrick unattended until notified by the A/D director that it is safe to do so. Before leaving, the operator shall in addition to the requirements specified in R 408.41019b(4) do both of the following:	CURRENT MIOSHA R 408.41031a(1)
(a) Lower the boom to the boom rest or the deck of the barge and fasten it securely to prevent displacement due to wind loads or other outside forces.	CURRENT MIOSHA R 408.41031a(1)(a)
(b) Engage manual locking devices in the absence of automatic holding equipment on derricks and engage swing brakes, boom brakes, and other locking devices on cranes.	CURRENT MIOSHA R 408.41031a(1)(b)
(4) If power fails during operation, the equipment operator shall do all of the	CURRENT MIOSHA R 408.41010a(6)

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
following:	
(a) Set all brakes and locking devices.	CURRENT MIOSHA R 408.41010a(6)(a)
(b) Move all clutch or other power controls to the off or neutral position.	CURRENT MIOSHA R 408.41010a(6)(b)
(c) Communicate with the A/D director in charge of equipment operations.	CURRENT MIOSHA R 408.41010a(6)(c)
(d) If practical, and applicable, land the load under brake control.	CURRENT MIOSHA R 408.41010a(6)(d)
(5) Work area control.	1926.1437(c) Work area control.
(a) The requirements of R 408.41022a shall apply, except for R 408.41022a(1)(b)(ii).	1926.1437(c)(1)The requirements of § 1926.1424 (Work area control) apply, except for § 1926.1424(a)(2)(ii).
(b) The employer shall do either of the following:	1926.1437(c)(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	1926.1437(c)(2)(i) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or
(ii) Affix to the rear and sides of the house and counterweight a danger sign, as prescribed in construction safety standard part 22 “Signals, Signs, Tags, and Barricades,” as referenced in R 408.41003a. The additional lettering on the danger sign shall indicate that the counterweight is swinging.	1926.1437(c)(2)(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 hazard areas. In addition, the employer must train each employee to understand what these markings signify.
(6) Keeping clear of the load. R 408.41023a shall not apply.	1926.1437(d) Keeping clear of the load. Section 1926.1425 does not apply.
(7) Additional safety devices. In addition to the safety devices listed in R 408.41018a, the following safety devices shall be required:	1926.1437(e) Additional safety devices. In addition to the safety devices listed in § 1926.1415, the following safety devices are required:
(a) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device shall be located in the cab or, when there is no cab, at the operator’s station.	1926.1437(e)(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.
(b) Positive equipment house lock.	1926.1437(e)(2) Positive equipment house lock.
(c) Wind speed and direction indicator. A competent person shall determine if wind is a factor that needs to be considered. If wind needs to be considered, a wind speed and direction indicator shall be used.	1926.1437(e)(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.
(8) Operational aids.	1926.1437(f) Operational aids.
(a) An anti two-block device shall be required only when hoisting personnel or hoisting over an occupied cofferdam or shaft.	1926.1437(f)(1) An anti two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft.
(b) R 408.41019a(5)(d) shall not apply to dragline, clamshell, grapple, magnet, drop ball, container handling, concrete bucket, and pile driving work performed under this rule.	1926.1437(f)(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.
(9) Accessibility of procedures applicable to equipment operation. If the crane or derrick has a cab, the requirements of R 408.41019b(3) shall apply. If the crane or derrick does not have a cab, the employer shall ensure that both of the following are met:	1926.1437(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:
(a) Rated capacities, load charts, are posted at the operator’s station. If the operator’s station is moveable, such as with pendant-controlled equipment, the load charts shall be posted on the equipment.	1926.1437(g)(1) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with pendant-controlled equipment), the load charts are posted on the equipment.
(b) Procedures, other than the load chards, applicable to the operation of the equipment, recommended operating speeds, special hazard warnings, instructions and operator’s manual, shall be readily available on board the vessel or flotation device.	1926.1437(g)(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.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(10) Inspections. In addition to meeting the requirements of R 408.41012a for inspecting the crane or derrick, the employer shall inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane or derrick or land crane or derrick, and ensure all of the following:	1926.1437(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:
(a) Shift. For each shift inspection, the means used to secure or attach the equipment to the vessel or flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and, when applicable, insufficient tension.	1926.1437(h)(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.
(b) Monthly. For each monthly inspection all of the following shall be met:	1926.1437(h)(2) Monthly. For each monthly inspection:
(i) The means used to secure or attach the equipment to the vessel or flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension.	1926.1437(h)(2)(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 or flotation device is not taking on water.	1926.1437(h)(2)(ii) The vessel/flotation device is not taking on water.
(iii) The deckload is properly secured.	1926.1437(h)(2)(iii)The deckload is properly secured.
(iv) The vessel or flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches.	1926.1437(h)(2)(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.	1926.1437(h)(2)(v) The firefighting and lifesaving equipment is in place and functional.
(c) The shift and monthly inspections shall be conducted by a competent person.	1926.1437(h)(3) The shift and monthly inspections are conducted by a competent person, and:
(i) If any deficiency is identified, an immediate determination shall be made by a qualified person whether the deficiency constitutes a hazard.	1926.1437(h)(3)(i) If any deficiency is identified, an immediate 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 or flotation device shall be removed from service until the deficiency has been corrected.	1926.1437(h)(3)(ii) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.
(d) Annual external vessel or flotation device inspection. For each annual inspection all of the following shall be met:	1926.1437(h)(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 shall be inspected annually by a qualified person who has expertise with respect to vessels or flotation devices and that the inspection shall include all of the following items:	1926.1437(h)(4)(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 subrules (10)(a) and (10)(b).	1926.1437(h)(4)(i)(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.	1926.1437(h)(4)(i)(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 or flotation device.	1926.1437(h)(4)(i)(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.	1926.1437(h)(4)(i)(D) Four-corner draft readings.
(E) Firefighting equipment for serviceability.	1926.1437(h)(4)(i)(E) Firefighting equipment for serviceability.
(ii) Rescue skiffs, lifelines, work vests, life preservers and ring buoys shall be inspected for proper condition.	1926.1437(h)(4)(ii) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition.

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(iii) If any deficiency is identified, an immediate determination shall be 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.	1926.1437(h)(4)(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 or flotation device shall be removed from service until it has been corrected. See requirements in R 408.41019b(6).	1926.1437(h)(4)(iii)(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 § 1926.1417(f).
(B) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency shall be checked in the monthly inspections.	1926.1437(h)(4)(iii)(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.
(e) Four-year internal vessel or flotation device inspection. For each 4 year inspection the following shall be included:	1926.1437(h)(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 or flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation.	1926.1437(h)(5)(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 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.	1926.1437(h)(5)(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 or flotation device shall be removed from service until it has been corrected.	1926.1437(h)(5)(ii)(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 shall be checked in the monthly or annual inspections, as appropriate.	1926.1437(h)(5)(ii)(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.
(f) Documentation. The monthly and annual inspections required in subrules (8)(b) and (8)(d) shall be documented in accordance with R 408.41012(6)(c) and R 408.41012(7)(g). The 4 year inspection required in subrule (8)(e) shall be documented in accordance with R 408.41012(7)(g), except that the documentation for that inspection shall be retained for a minimum of 4 years. All of these documents shall be made available, during the applicable document retention period, to all persons who conduct inspections in accordance with R 408.41012a.	1926.1437(h)(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 with § 1926.1412.
(11) [Reserved.]	1926.1437(i) [Reserved.]
(12) Working with a diver. The employer shall meet the following additional requirements when working with a diver in the water:	1926.1437(j) Working with a diver. The employer must meet the following additional requirements when working with a diver in the water:
(a) If a crane or 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, a crane or derrick shall not be used for any other purpose until all divers are back on board.	1926.1437(j)(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.
(b) The operator shall remain at the controls of the crane or derrick at all times.	1926.1437(j)(2) The operator must remain at the controls of the crane/derrick at all times.
(c) In addition to the requirements in R 408.41011b to R 408.41011e, either	1926.1437(j)(3) In addition to the requirements in §§ 1926.1419 through

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
of the following shall be met:	1926.1422 (Signals), either:
(i) A clear line of sight shall be maintained between the operator and tender.	1926.1437(j)(3)(i) A clear line of sight must be maintained between the operator and tender; or
(ii) The signals between the operator and tender shall be transmitted electronically.	1926.1437(j)(3)(ii) The signals between the operator and tender must be transmitted electronically.
(d) The means used to secure the crane or derrick to the vessel or flotation device, as specified in subrule (16)(e), shall not allow any amount of shifting in any direction.	1926.1437(j)(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.
(13) Manufacturer's specifications and limitations.	1926.1437(k) Manufacturer's specifications and limitations.
(a) The employer shall ensure that the barge, pontoons, vessel, or other means of flotation shall be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations.	1926.1437(k)(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.
(b) The employer shall 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 shall not be exceeded or violated.	1926.1437(k)(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.
(c) When the manufacturer's specifications and limitations are unavailable, the employer shall 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.	1926.1437(k)(3) When the manufacturer's specifications and limitations 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.
(14) [Reserved.]	1926.1437(l) [Reserved.]
(15) Floating cranes or derricks. For equipment designed by the manufacturer or employer for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation, all of the following shall be met:	1926.1437(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:
(a) Load charts.	1926.1437(m)(1) Load charts.
(i) The employer shall not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer shall comply with all parameters and limitations, such as dynamic and environmental parameters, applicable to the use of the charts.	1926.1437(m)(1)(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 shall ensure that load charts take into consideration a minimum wind speed of 40 miles per hour.	1926.1437(m)(1)(ii) The employer must ensure that load charts take into consideration a minimum wind speed of 40 miles per hour.
(b) The employer shall ensure that the requirements for maximum allowable list and maximum allowable trim, as specified in Table 13a of this rule, are met.	1926.1437(m)(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.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment

TABLE 13a

Rated capacity (degrees)	Maximum allowable list (degrees)	Maximum allowable trim
Equipment designed for marine use by permanent attachment (other than derricks):		
25 tons or less	**5**	**5**
Over 25 tons	**7**	**7**
Derricks designed for marine use by permanent attachment:		
Any rated capacity	**10**	**10**

(c) The employer shall ensure that the equipment is stable under the conditions specified in Tables 13b and 13c of this rule. Note: Freeboard means the vertical distance between the water line and the main deck of the vessel.

TABLE 13b

Operated at (ft)	Wind speed (mph)	Minimum freeboard
Rated capacity	**60**	**2**
Rated capacity plus 25%	**60**	**1**
High boom, no load	**60**	**2**

TABLE 13c

Operated at	Wind speed
For backward stability of the boom:	
High boom, no load, full back list (least stable condition).	**90 mph.**

(d) If the equipment is employer made, it shall not be used unless the

OSHA 1926.14 Cranes and Derricks in Construction

Table M1

Rated capacity	Maximum allowable list (degrees)	Maximum allowable list (degrees)
Equipment designed for marine use by permanent attachment (other than derricks):		
25 tons or less	5	5
Over 25 tons	7	7
Derricks designed for marine use by permanent attachment:		
Any rated capacity	10	10

1926.1437(m)(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.)

Table M2

Operated at	Wind speed (mph)	Minimum freeboard (ft)
Rated capacity	60	2
Rated capacity plus 25%	60	1
High boom, no load	60	2

Table M3

Operated at	Wind speed
For backward stability of the boom: High boom, no load, full back list (least stable condition).	90 mph.

1926.1437(m)(4) If the equipment is employer-made, it must not be used

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of subrules (15)(a) to (c). These 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.	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).
(e) The employer shall ensure that the barge, pontoons, vessel or other means of flotation used comply with all of the following:	1926.1437(m)(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 dynamic loads of the crane or derrick when operating at the crane or derrick's maximum rated capacity with all planned and actual deck loads and ballasted compartments.	1926.1437(m)(5)(i) Are structurally sufficient to withstand the static and 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.	1926.1437(m)(5)(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.	1926.1437(m)(5)(iii) Have access to void compartments to allow for inspection and pumping.
(16) Land cranes or derricks. For land cranes or derricks used on barges, pontoons, vessels or other means of flotation, the employer shall ensure all of the following:	1926.1437(n) 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 do the following:	1926.1437(n)(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.	1926.1437(n)(1)(i) Account for increased loading from list, trim, wave action, and wind.
(ii) Be applicable to a specified location or locations on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered.	1926.1437(n)(1)(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 subrules (16)(c) and (16)(d) are met.	1926.1437(n)(1)(iii) The conditions required in paragraphs (n)(3) and (n)(4) of this section are met.
(b) The rated capacity modification required in subrule (16)(a) shall be performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane or derrick capacity and the stability of vessels or flotation devices.	1926.1437(n)(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.
(c) For list and trim.	1926.1437(n)(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 shall not exceed the amount necessary to ensure that the conditions in subrule (16)(d) 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 or derrick manufacturer, or, when an amount is not specified, the amount specified by the qualified person.	1926.1437(n)(3)(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 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 or derrick shall not exceed the amount specified by the crane or derrick manufacturer, or, when an amount is not specified, the amount specified by	1926.1437(n)(3)(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

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
the qualified person.	amount specified by the qualified person.
(d) For the following conditions, these requirements shall be met:	1926.1437(n)(4) For the following conditions:
(i) All deck surfaces of the barge, pontoons, vessel or other means of flotation used shall be above water.	1926.1437(n)(4)(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 shall be submerged.	1926.1437(n)(4)(ii) The entire bottom area of the barge, pontoons, vessel or other means of flotation used is submerged.
(e) Physical attachment, corralling, rails system and centerline cable system shall meet the requirements in Option (1), Option (2), Option (3), or Option (4) of this subrule. Whichever option is used shall also meet the requirements of subrule (16)(e)(v).	1926.1437(n)(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 or 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 or derrick and vessel or flotation device, bolting or welding the crane or derrick to the vessel or flotation device, strapping the crane or derrick to the vessel or flotation device with chains, or other methods of physical attachment.	1926.1437(n)(5)(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 or derrick shall be prevented from shifting by installing barricade restraints, such as a corralling system. Employers shall ensure that corralling systems do not allow the equipment to shift by any amount in any direction.	1926.1437(n)(5)(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.
(iii) Option (3)—Rails. The crane or derrick shall be prevented from shifting by being mounted on a rail system. Employers shall ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means.	1926.1437(n)(5)(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 or derrick shall be prevented from shifting by being mounted to a wire rope system. The employer shall ensure that the wire rope system meets the following requirements:	1926.1437(n)(5)(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 or derrick.	1926.1437(n)(5)(iv)(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 or flotation device.	1926.1437(n)(5)(iv)(B) The wire rope is attached physically to the vessel/flotation device.
(C) The wire rope is attached to the crane or derrick by appropriate attachment methods, such as shackles or sheaves, on the undercarriage, and that the method used shall allow the crew to secure the crane or derrick from movement during operation and to move the crane or derrick longitudinally along the vessel or flotation device for repositioning.	1926.1437(n)(5)(iv)(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 or derrick from passing the forward or aft end of the wire rope attachments.	1926.1437(n)(5)(iv)(D) Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments.
(E) The crane or derrick is secured from movement during operation.	1926.1437(n)(5)(iv)(E) The crane/derrick is secured from movement during operation.
(v) The systems or means used to comply with Option (1), Option (2), Option (3), or Option (4) of this subrule shall be designed by a marine engineer,	1926.1437(n)(5)(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,

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
registered professional engineer familiar with floating crane or derrick design, or qualified person familiar with floating crane or derrick design.	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 or derrick, the requirement specified by subrule (16)(e) to use Option (1), Option (2), Option (3), or Option (4) shall not apply when the employer demonstrates implementation of a plan and procedures that meet the following requirements:	1926.1437(n)(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 (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 or derrick design develops and signs a written plan for the use of the mobile auxiliary crane.	1926.1437(n)(6)(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 rule shall 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.	1926.1437(n)(6)(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.	1926.1437(n)(6)(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.	1926.1437(n)(6)(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 shall be present for use of the plan.	1926.1437(n)(6)(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 subrule (16)(f)(v) are exceeded, the mobile auxiliary crane shall be attached physically or corralled according to Option (1), Option (2) or Option (4) of subrule (16)(e).	1926.1437(n)(6)(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.
(g) The barge, pontoons, vessel or other means of flotation used shall comply with the following:	1926.1437(n)(7) The barge, pontoons, vessel or other means of flotation used:
(i) Be structurally sufficient to withstand the static and dynamic loads of the crane or derrick when operating at the crane's or derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments.	1926.1437(n)(7)(i) Are structurally sufficient to withstand the static and 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.	1926.1437(n)(7)(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.	1926.1437(n)(7)(iii)Have access to void compartments to allow for inspection and pumping.
(17) An employer shall comply with the applicable requirements for the protection of employees who work on marine vessels specified in construction safety standard part 13. "Mobile Equipment," as referenced in R 408.41003a.	CURRENT MIOSHA R 408.41031a(11)
R 408.41032a Dedicated pile drivers.	1926.1439 Dedicated pile drivers.
Rule 1032a. (1) The provisions of this standard shall apply to dedicated pile drivers, except as specified in this section.	1926.1439(a)The provisions of subpart CC apply to dedicated pile drivers, except as specified in this section.
(2) R 408.41019a(4)(c) shall not apply.	1926.1439(b) Section 1926.1416(d)(3) (Anti two-blocking device) does not

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
	apply.
(3) R 408.41019a(5)(d) shall apply only to dedicated pile drivers manufactured after November 8, 2011.	1926.1439(c) Section 1926.1416(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after November 8, 2011.
(4) In R 408.41027, only R 408.41027(4) and (5) shall apply to dedicated pile drivers.	1926.1439(d) In § 1926.1433, only §§ 1926.1433(d) and (e) apply to dedicated pile drivers.
R 408.41033a Sideboom cranes.	1926.1440 Sideboom cranes.
Rule 1033a. (1) The provisions of this standard apply, except R 408.41017a, R 408.41018a, R 408.41019a, and R 408.41008a.	1926.1440(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).
(2) R 408.41024a applies, except R 408.41024a(1)(b)(i). Sideboom cranes in which the boom is designed to free fall, live boom, are permitted only if manufactured prior to November 8, 2010.	1926.1440(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 November 8, 2010.
(3) Sideboom cranes mounted on wheel or crawler tractors shall meet all of the following requirements of ASME B30.14 “Side Boom Tractors,” 2004 edition, which is adopted by reference in R 408.41003a:	1926.1440(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):
(a) Section 14–1.1 (‘‘Load Ratings’’).	1926.1440(c)(1) Section 14-1.1 ("Load Ratings").
(b) Section 14–1.3 (‘‘Side Boom Tractor Travel’’).	1926.1440(c)(2) Section 14-1.3 ("Side Boom Tractor Travel").
(c) Section 14–1.5 (‘‘Ropes and Reeving Accessories’’).	1926.1440(c)(3) Section 14-1.5 ("Ropes and Reeving Accessories").
(d) Section 14–1.7.1 (‘‘Booms’’).	1926.1440(c)(4) Section 14-1.7.1 ("Booms").
(e) Section 14–1.7.2 (‘‘General Requirements—Exhaust Gases’’).	1926.1440(c)(5) Section 14-1.7.2 ("General Requirements--Exhaust Gases").
(f) Section 14–1.7.3 (‘‘General Requirements—Stabilizers (Wheel-Type Side Boom Tractors)’’).	1926.1440(c)(6) Section 14-1.7.3 ("General Requirements--Stabilizers (Wheel-Type Side Boom Tractors)").
(g) Section 14–1.7.4 (‘‘General Requirements—Welded Construction’’).	1926.1440(c)(7) Section 14-1.7.4 ("General Requirements--Welded Construction").
(h) Section 14–1.7.6 (‘‘General Requirements—Clutch and Brake Protection’’).	1926.1440(c)(8) Section 14-1.7.6 ("General Requirements--Clutch and Brake Protection").
(i) Section 14–2.2.2 (‘‘Testing—Rated Load Test’’), except that it applies only to equipment that has been altered or modified.	1926.1440(c)(9) Section 14-2.2.2 ("Testing--Rated Load Test"), except that it applies only to equipment that has been altered or modified.
(j) In section 14–3.1.2 (‘‘Operator Qualifications’’), paragraph (a), except the phrase ‘‘When required by law.’’	1926.1440(c)(10) In section 14-3.1.2 ("Operator Qualifications"), paragraph (a), except the phrase "When required by law."
(k) In section 14–3.1.3 (‘‘Operating Practices’’), paragraphs (e), (f)(1)—(f)(4), (f)(6), (f)(7), (h), and (i).	1926.1440(c)(11) In section 14-3.1.3 ("Operating Practices"), paragraphs (e), (f)(1)--(f)(4), (f)(6), (f)(7), (h), and (i).
(l) In section 14–3.2.3 (‘‘Moving the Load’’), paragraphs (j), (l), and (m).	1926.1440(c)(12) In section 14-3.2.3 ("Moving the Load"), paragraphs (j), (l), and (m).
R 408.41034a Equipment with a rated hoisting or lifting capacity of 2,000 pounds or less.	1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.
Rule 1034a. This rule specifies requirements for employers using equipment with a maximum rated hoisting or lifting capacity of 2,000 pounds or less.	
(1) The employer using this equipment shall comply with the following	1926.1441(a) The employer using this equipment must comply with the

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
provisions: (a) R 408.41001a. (b) R 408.41004a and R 408.41005a. (c) R 408.41011b to 408.41011e. (d) R 408.41012a(4). (e) R 408.41013a to R 408.41014a. (f) R 408.41015a(1). (g) R 408.41015a(4). (h) R 408.41016a to R 408.41016d. (i) R 408.41017a. (j) R 408.41019c. (k) R 408.41020a. (l) R 408.41023a, except for R 408.41023a(3)(c). (m) R 408.41024a. (n) R 408.41025a. (o) R 408.41026a. (p) R 408.41028a. (q) R 408.41029a. (r) R 408.41030a. (s) R 408.41031a.	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).
(2) Assembly or disassembly.	1926.1441(b) Assembly/disassembly.
(a) In addition to complying with R 408.41015a(1) and R 408.41015a(4), the employer shall also comply with R 408.41034a(2)(b) and (c).	1926.1441(b)(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 Sec. 1926.1441(b)(2)-(3).
(b) Components and configuration. The employer shall ensure the following:	1926.1441(b)(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 one of the following:	1926.1441(b)(2)(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's instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a registered professional engineer familiar with the type of equipment involved shall approve, in writing, the selection and configuration of components.	1926.1441(b)(2)(i)(A) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information 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 R 408.41028a.	1926.1441(b)(2)(i)(B) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications).
(ii) Post-assembly inspection. Upon completion of assembly, the equipment shall be inspected to ensure that it complies with subrule (2)(b)(i). See R 408.41012(4) for post-assembly inspection requirements.	1926.1441(b)(2)(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).
(c) Manufacturer prohibitions. The employer shall comply with applicable manufacturer prohibitions.	1926.1441(b)(3) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.
(3) Operation—procedures.	1926.1441(c) Operation--procedures.

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(a) The employer shall comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments.	1926.1441(c)(1) The employer must comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments.
(b) Unavailable operation procedures. The employer shall comply with the following:	1926.1441(c)(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.	1926.1441(c)(2)(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.	1926.1441(c)(2)(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 who is familiar with the equipment.	1926.1441(c)(2)(iii) Ensure that procedures related to the capacity of the equipment are developed and signed by a registered professional engineer familiar with the equipment.
(c) Accessibility. The employer shall ensure all of the following:	1926.1441(c)(3) Accessibility. The employer must ensure that:
(i) The load chart is available to the operator at the control station.	1926.1441(c)(3)(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.	1926.1441(c)(3)(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.
(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.	1926.1441(c)(3)(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.
(4) Safety devices and operational aids.	1926.1441(d) Safety devices and operational aids.
(a) The employer shall ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer procedures.	1926.1441(d)(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.
(b) Anti two-blocking. The employer shall ensure that equipment covered by this section manufactured more than 1 year after November 8, 2010 have either an anti two-block device that meets the requirements of R 408.41019a(4)(c) or is designed so that in the event of a two-block situation no damage or load failure will occur, such as by using a power unit that stalls in response to a two-block situation.	1926.1441(d)(2) Anti two-blocking. The employer must ensure that equipment covered by this section manufactured more than one year after November 8, 2010 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).
(5) Operator qualifications. The employer shall train each operator, prior to operating the equipment, on the safe operation of the type of equipment the operator will be using.	1926.1441(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.
(6) Signal person qualifications. The employer shall train each signal person in the proper use of signals applicable to the use of the equipment.	1926.1441(f) Signal person qualifications. The employer must train each signal person in the proper use of signals applicable to the use of the equipment.
(7) [Reserved.]	1926.1441(g) [Reserved.]
(8) Inspections. The employer shall ensure that equipment is inspected in accordance with manufacturer procedures.	1926.1441(h) Inspections. The employer must ensure that equipment is inspected in accordance with manufacturer procedures.
(9) [Reserved.]	1926.1441(i) [Reserved.]

CS Part 10 Lifting and Digging Equipment
Comparison with OSHA Subpart CC 1926.14 Cranes and Derricks in Construction

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(10) Hoisting personnel. The employer shall ensure that equipment covered by this standard is not used to hoist personnel.	1926.1441(j) Hoisting personnel. The employer must ensure that equipment covered by this section is not used to hoist personnel.
(11) Design. The employer shall ensure that the equipment is designed by a qualified engineer.	1926.1441(k) Design. The employer must ensure that the equipment is designed by a qualified engineer.
R 408.41041a Excavating equipment; operating rules generally.	
Rule 1041a. (1) An employer shall assure that a prospective operator, before being assigned as an operator of excavation equipment, has been trained in all of the following areas:	**THESE ARE EXISTING MIOSHA EXCAVATION RULES. FEDERAL RULE 1926.550 COVERS EXCAVATION.**
(a) The capabilities of equipment and attachments.	
(b) The purpose, use, and limitations of controls.	
(c) The making of daily inspections.	
(d) Practice in operating assigned equipment to perform the functions necessary for required jobs.	
(e) Applicable state standards and company rules and regulations.	
(2) An operator shall not leave excavation equipment unattended with a load suspended above the ground, floor, or platform during working operations. A bucket or blade shall not be left suspended above the ground when a machine is unattended.	
(3) The provisions of subrule (3) shall not prohibit leaving job-related equipment hanging on the hook to prevent theft or vandalism during the hours the project is shut down.	
(4) Windows of any excavation equipment shall be equipped with safety glass or its equivalent. Visual distortions which are caused by broken or defective glass and which would affect the safe operation of the equipment when in use shall be corrected.	
(5) Where necessary for rigging or servicing, a ladder or steps shall be provided to give access to a cab roof.	
(6) Handholds and steps shall be provided on all lifting and digging equipment for access to the cab. Platforms and walkways shall have slip-resistant surfaces, and guardrails as prescribed in construction safety standards Part 21 “Guarding of Walking and Working Areas,” and construction safety standards Part 45 “Fall Protection,” as referenced in R 408.41003a.	
(7) Fuels shall be transported, stored, and handled as prescribed in construction safety standard Part 18 “Fire Protection and Prevention,” as referenced in R 408.41003a.	
(8) An employee shall not be permitted under a suspended load.	
(9) Excavation equipment shall not be loaded beyond the rated load.	
(10) When loads that are limited by hydraulic or structural competence rather than by stability are to be handled, the person who is responsible for the job shall ascertain that the weight of a load approaching rated capacity has been determined and does not exceed the capacity of the equipment.	
(11) In moving a load, an operator shall avoid sudden acceleration or	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
deceleration of a moving boom that would cause a swinging action by the load.	
(12) A load shall be secured and balanced before the load is lifted more than 6 inches.	
(13) A load shall not be moved in a manner that could contact obstructions.	
(14) A tag line shall be used when rotation of the load would be hazardous.	
(15) Excavation equipment shall not be used for dragging a load sideways.	
(16) Before moving excavation equipment that is carrying a load, an on-site supervisor or an operator, or both, shall determine all of the following:	
(a) The position to carry the load.	
(b) The boom location.	
(c) The ground conditions.	
(d) The travel route.	
(e) The speed of movement.	
(f) The location of overhead wires.	
(17) While being moved from one jobsite to another, excavation equipment shall comply with both of the following provisions:	
(a) The boom shall be carried in line with the direction of movement.	
(b) The superstructure shall be secured against rotation, except when negotiating a turn with an operator in the cab or the boom on a dolly.	
(18) Excavation equipment shall not travel with the boom at a height that could allow the boom to bounce back over the cab.	
(19) For moving loads with multiple pieces of excavation equipment, the requirements of subrule (23) shall be met. The load, conditions, and equipment capacities shall be analyzed and a plan of operation shall be formulated.	
(20) Clothing, personal belongings, tools, and other articles within a cab or operating enclosure shall be stored in cabinets, boxes, or by other means so as not to interfere with access or operations.	
(21) A portable fire extinguisher that has a rating of not less than 10 BC, shall be kept in the cab or operating enclosure. When there is no cab or enclosure, it shall be kept on the jobsite within a 200-foot radius of the equipment and shall be readily available. The operator and maintenance employees shall be trained in the use of the fire extinguisher.	
(22) When night operations are carried out, lighting shall illuminate the immediate working area to a minimum of 10 footcandles and shall not interfere with the operator's vision.	
(23) An employee shall not ride the bare hook or on a load of material suspended from the hook.	
(24) An employer shall comply with the requirements of the power crane and shovel associations' mobile hydraulic crane standard no. 4 "Mobile Power Crane and Excavator and Hydraulic Crane Standards," 1983 edition, as adopted by reference in R 408.41003a.	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
(25) When working in proximity to power lines, excavation equipment shall maintain clearances as prescribed in Table A and Table T.	
(26) If an employee could be struck by the rotating superstructure of excavation equipment, the hazardous area shall be barricaded to prevent an employee from entering and being struck.	
(27) If clearances between the rotating or moving structure of constantly moving excavation equipment can create a pinch point for an employee, or if an employee could be struck by the rotating superstructure, an employer, in place of barricades, shall train and instruct each employee to stay out of the danger area and a danger sign, as prescribed in construction safety standards Part 22 “Signals, Signs, Tags, and Barricades,” as referenced in R 408.41003a, shall be affixed to the rear and sides of the house and counterweight. The additional lettering on the danger sign shall indicate that the counterweight is swinging.	
(28) An employee shall remain clear of excavation equipment at all times unless the employee is operating the equipment.	
R 408.41051a Inspections generally, excavation equipment.	
Rule 1051a. (1) A thorough, annual inspection of all boom equipped excavating equipment shall be made by a qualified person. An employer shall maintain, on the jobsite or attached to the equipment, a copy of the latest equipment inspection record with the date and results for each piece of equipment.	
(2) An employer shall designate a qualified person to perform all inspections of excavation equipment as required in R 408.41012a.	
MATERIAL AND PERSONNEL HOISTS (ELEVATORS)	
R 408.41065a Material and personnel hoists generally.	
Rule 1065a. (1) An employer shall ensure that an employee who is specifically engaged in installing personnel elevators or hoists is licensed by the state of Michigan in accordance with Act No. 227 of the Public Acts of 1967 and Act No. 333 of the Public Acts of 1976, being MCL 408.801 et seq. and MCL §338.2151 et seq., respectively, and the rules of the department of licensing and regulatory affairs relating to elevators.	
(2) An employer shall comply with the manufacturer's specifications and limitations applicable to the operation of all material and personnel hoists. If the manufacturer's specifications are not available, then the limitations assigned to the equipment shall be determined by a qualified person who is competent in the field and shall be based on the requirements of ANSI A10.4 "Safety Requirements for Personal Hoists and Employee Elevators for Construction and Demolition Operations," 2004 edition and ANSI A10.5	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
"Safety Requirements for Material Hoists," 1992 edition, which are adopted by reference in R 408.41003a. A determination shall be documented and recorded. Attachments used shall not exceed the capacity, rating, or scope recommended by the manufacturer.	
(3) The employer shall ensure that rated load capacities, recommended operating speeds, and special hazard warnings or instructions shall be posted on cars and platforms.	
R 408.41070b Material hoists.	
Rule 1070b. (1) Operating rules for material hoists shall be established and posted at the operator's station of the hoist. The rules shall include a signal system and the applicable manufacturer's specifications for rated operating speed. Rules and notices shall be posted on the car frame in a conspicuous location and shall include the statement "no riders allowed." A person shall not be allowed to ride on a material hoist, except for inspection and maintenance.	
(2) All entrances of the hoistway shall be protected by substantial gates that shall guard the full width of the landing entrance from floor to ceiling. A hoistway entrance gate shall be identified as such.	
(3) A gate that protects the entrance to a hoistway shall be equipped with a latching device and be not more than 4 inches from the edge of the landing sill. A gate shall extend a minimum of 6 feet 8 inches above the floor.	
(4) An overhead protective covering of 2-inch planking or other solid material of equivalent strength shall be provided on the top of every material hoist cage or platform.	
(5) An operator's station of a hoisting machine shall have overhead protection equivalent to tight planking that is not less than 2 inches thick. The support for the overhead protection shall be of equal strength.	
(6) A hoist tower may be used with or without enclosures on all sides. However, whichever alternative is chosen, all of the following applicable conditions shall be met:	
(a) When a hoist tower is enclosed, it shall be enclosed on all sides for its entire height with a screen enclosure of not more than ½-inch mesh of no. 18 united states gauge wire or equivalent, except for a landing access.	
(b) When a hoist tower is not enclosed, the hoist platform or car shall be totally enclosed (caged) on all sides for the full height between the floor and the overhead protective covering with ½-inch mesh of no. 14 united states gauge wire or equivalent. The hoist platform enclosure shall include the required gates for loading and unloading. An 8-foot high enclosure shall be provided on the unused sides of the hoist tower at ground level.	
(c) In either alternative, the cab or platform shall be enclosed as specified in subdivision (b) of this subrule.	
(7) A car safety device shall be installed to function in case of rope failure	

CS Part 10 Lifting and Digging Equipment	OSHA 1926.14 Cranes and Derricks in Construction
and shall be tested upon installation and at 4-month intervals.	
(8) A material hoist tower shall be designed by a licensed professional engineer.	
(9) Wire rope shall be in compliance with the requirements of R 408.41013a and R 408.41014a and shall be inspected and removed from service if any condition specified in R 408.1013a and R 408.41014a is present.	
PERSONNEL HOISTS	
R 408.41071a Inspections.	
Rule 1071a. (1) Before being put into service, a qualified person shall inspect and test all functions of a personnel hoist. An inspection and test is required after a major alteration of an existing installation. All hoists shall be inspected and tested at not more than 90-day intervals.	
(2) An employer shall prepare a certification record that includes all of the following information:	
(a) The date of the inspection and test of all functions and safety devices that were performed.	
(b) The signature of the person who performed the inspection and tests.	
(c) A serial number or other identifier for the hoist that was inspected and tested. The most recent certification record shall be maintained on file on the jobsite.	
(3) A load safety test, as required by ANSI A10.4 "Safety Requirements for Personnel Hoists and Employee Elevators for Construction and Demolition Operations," 2004 edition, which is adopted by reference in R 408.41003a, shall be performed on a personnel hoist by a licensed elevator contractor in the presence of a state of Michigan elevator inspector every 90 days.	
(4) All control mechanisms shall be inspected daily for misadjustments that might interfere with proper operation and for excessive wear of components.	
R 408.41075a Use of multiple permanent elevators; use of endless belt-type manlifts.	
Rule 1075a. (1) When multiple permanent elevators are available and 1 elevator is being used for construction or renovation purposes, that elevator shall be for the exclusive use of construction personnel and shall be operated by a designated operator. The elevator signal system shall be separate from any other elevators.	
(2) Endless belt-type manlifts shall not be used for construction.	
R 408.41077a Rescinded.	
R 408.41099a Rescinded.	