SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Subpart A—General		
1. The authority citation for subpart A of 29 CFR part 1926 is retained as follows: …		CA cites authority at each section.
2. Section 1926.6 is added to read as follows:		
§ 1926.6 Incorporation by reference. (a) The standards of agencies of the U.S. Government, and organizations which are not agencies of the U.S. Government which are incorporated by reference in this part, have the same force and effect as other standards in this part. Only the mandatory provisions (i.e., provisions containing the word ''shall'' or other mandatory language) of standards incorporated by reference are adopted as standards under the Occupational Safety and Health Act. The locations where these standards may be examined are as follows: (1) Offices of the Occupational Safety and Health Administration, U.S. Department of Labor, Frances Perkins Building, Washington, DC 20210. (2) The Regional and Field Offices of the Occupational Safety and Health Administration, which are listed in the U.S. Government Manual.	§1610.2. Design Standards. (b) Cranes and derricks used in construction which are manufactured on or after [Effective date] shall be designed, constructed and installed in accordance with the following applicable standards which are hereby incorporated by reference:	Per FR page 47919, this is primarily a "technical amendment," relocating referenced standards from 1926.31 to 1926.6 for "organizational purposes." The FR (page 47919) made the following statement: "OSHA is adding to the list of documents incorporated by reference those documents that are newly incorporated by reference in these final rules. The Federal Register approved these documents, which are listed as follows, for incorporation by reference as of November 8, 2010: ANSI B30.5–1968; ASME B30.2–2005; ASME B–30.5–2004; ASME B30.7–2001; ASME B30.14–2004; AWS D1.1/D1.1M:2002; ANSI/AWS D14.3–94; BS EN 13000:2004; BS EN 14439:2006; ISO 11660–1:2008(E); ISO 11660–2:1994(E); ISO 11660–3:2008(E); PCSA Std. No. 2 (1968); SAE J185 (May 2003); SAE J987 (Jun. 2003); and SAE J1063 (Nov. 1993)." Therefore, the CA crane standard will adopt these new standards as indicated in the following rows. California standards will also include reference standards for cranes manufactured prior to the effective date of this standard since subject cranes were previously subject to the provisions of GISO Group 13 Crane standards.
(b) The materials listed in paragraphs (g) through (ff) of this section are incorporated by reference in the corresponding sections noted as		These standards not relevant to the current adoption.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
they exist on the date of the approval, and a notice of any change in these materials will be published in the Federal Register. These incorporations by reference were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. (c) Copies of standards listed in this section and issued by private standards organizations are available for purchase from the issuing organizations at the addresses or through the other contact information listed below for these private standards organizations. In addition, these standards are available for inspection at the National Archives and Records Administration (NARA). For information on the availability of these standards at NARA, telephone: 202–741–6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ ibr_locations.html. Also, the standards are available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department of Labor, 200 Constitution Avenue, NW., Room N–2625, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627). (d) [Reserved.] (e) [Reserved.] (f) [Reserved.] (g) The following material is available for purchase from the American Conference of		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Governmental Industrial Hygienists (ACGIH), 1330 Kemper Meadow Drive, Cincinnati, OH 45240; telephone: 513–742–6163; fax: 513–742–3355; e-mail: mail@acgih.org; Web site: http://www.acgih.org: (1) Threshold Limit Values of Airborne Contaminants for 1970, 1970, IBR approved for § 1926.55(a) and Appendix A of § 1926.55. (h) The following material is available for purchase from the American National Standards Institute (ANSI), 25 West 43rd Street, Fourth Floor, New York, NY 10036; telephone: 212–642–4900; fax: 212–302–1286; e-mail: info@ansi.org; Web site: http://www.ansi.org/. (1) ANSI A10.3–1970, Safety Requirements for Explosive-Actuated Fastening Tools, IBR approved for § 1926.302(e). (2) ANSI A10.4–1963, Safety Requirements for Workmen's Hoists, IBR approved for § 1926.552(c). (3) ANSI A10.5–1969, Safety Requirements for Material Hoists, IBR approved for § 1926.552(b). (4) ANSI A11.1–1965 (R1970), Practice for Industrial Lighting, IBR approved for § 1926.56(b). (5) ANSI A17.1–1965, Elevators, Dumbwaiters, Escalators, and Moving Walks, IBR approved for § 1926.552(d). (6) ANSI A17.1a–1967, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (7) ANSI A17.1b–1968, Elevators,		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (8) ANSI A17.1c–1969, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (9) ANSI A17.1d–1970, Elevators, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d). (10) ANSI A17.2–1960, Practice for the Inspection of Elevators (Inspector's Manual), IBR approved for § 1926.552(d). (11) ANSI A17.2a–1965, Practice for the Inspection of Elevators (Inspector's Manual) Supplement, IBR approved for § 1926.552(d). (12) ANSI A17.2b–1967, Practice for the Inspection of Elevators (Inspector's Manual) Supplement, IBR approved for § 1926.552(d). (13) ANSI A92.2–1969, Vehicle Mounted Elevating and Rotating Work Platforms, IBR approved for §§ 1926.453(a) and 1926.453(b). (14) ANSI B7.1–1970, Safety Code for the Use, Care, and Protection of Abrasive Wheels, IBR approved for §§ 1926.57(g), 1926.303(b), 1926.303(c), and 1926.303(d). (15) ANSI B20.1–1957, Safety Code for Conveyors, Cableways, and Related Equipment, IBR approved for § 1926.555(a). (16) ANSI B56.1–1969, Safety Standards for Powered Industrial Trucks, IBR approved for § 1926.602(c). (17) ANSI J6.1–1950 (R1971), Rubber Insulating Line Hose, IBR approved for § 1926.951(a). (18) ANSI J6.2–1950 (R1971), Rubber		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Insulating Hoods, IBR approved for § 1926.951(a). (19) ANSI J6.4–1971, Rubber Insulating Blankets, IBR approved for § 1926.951(a). (20) ANSI J6.5–1971, Rubber Insulating Sleeves, IBR approved for § 1926.951(a). (21) ANSI J6.6–1971, Rubber Insulating Gloves, IBR approved for § 1926.951(a). (22) ANSI J6.7–1935 (R1971), Rubber Matting for Use Around Electric Apparatus, IBR approved for § 1926.951(a). (23) ANSI O1.1–1961, Safety Code for Woodworking Machinery, IBR approved for § 1926.304(f). (24) ANSI Z35.1–1968, Specifications for Accident Prevention Signs, IBR approved for § 1926.200(i). (25) ANSI Z35.2–1968, Specifications for Accident Prevention Tags, IBR approved for § 1926.200(i). (26) ANSI Z49.1–1967, Safety in Welding and Cutting, IBR approved for § 1926.350(j). (27) ANSI Z87.1–1968, Practice for Occupational and Educational Eye and Face Protection, IBR approved for § 1926.102(a). (28) ANSI Z89.1–1969, Safety Requirements for Industrial Head Protection, IBR approved for § 1926.100(b). (29) ANSI Z89.2–1971, Industrial Protective Helmets for Electrical Workers, Class B, IBR approved for §§ 1926.100(c) and 1926.951(a). (i) [Reserved.] (j) The following material is available for purchase from the American Society for		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Testing and Materials (ASTM), ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428–2959; telephone: 610–832–9585; fax: 610–832–9555; e-mail: service@astm.org; Web site: http://www.astm.org/: (1) ASTM A370–1968, Methods and Definitions for Mechanical Testing and Steel Products, IBR approved for § 1926.1001(f). (2) ASTM B117–1964, 50 Hour Test, IBR approved for § 1926.959(a). (3) ASTM D56–1969, Standard Method of Test for Flash Point by the Tag Closed Tester, IBR approved for § 1926.155(i). (4) ASTM D93–1969, Standard Method of Test for Flash Point by the Pensky Martens Closed Tester, IBR approved for § 1926.155(i). (5) ASTM D323–1958 (R1968), Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method), IBR approved for § 1926.155(m).		
(k) The following material is available for purchase from the American Society of Agricultural and Biological Engineers (ASABE), 2950 Niles Road, St. Joseph, MI 49085; telephone: 269–429–0300; fax: 269–429–3852; e-mail: hq@asabe.org; Web site: http://www.asabe.org/: (1) ASAE R313.1–1971, Soil Cone Penetrometer, reaffirmed 1975, IBR approved for § 1926.1002(e).		
(l) The following material is available for purchase from the American Society of Mechanical Engineers (ASME), Three Park	(1) American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards:	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Avenue, New York, NY 10016; telephone: 1–800–843–2763; fax: 973–882–1717; e-mail: infocentral@asme.org; Web site: http://www.asme.org/:		
(1) **ASME B30.2–2005**, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist), issued Dec. 30, 2005 (''ASME B30.2–2005''), IBR approved for § 1926.1438(b).	(A) ASME B30.2–2005, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist), issued Dec. 30, 2005.	CA will adopt federal referenced standards.
	(B) B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) (C) B30.4-1996, Portal, Tower and Pedestal	These standards, currently applicable to cranes in California are not included in the federal standard.
(2) **ASME B30.5–2004**, Mobile and Locomotive Cranes, issued Sept. 27, 2004 (''ASME B30.5–2004''), IBR approved for §§ 1926.1414(b); 1926.1414(e); 1926.1433(b).	(D) ASME B30.5–2004, Mobile and Locomotive Cranes, issued Sept. 27, 2004.	CA will adopt federal referenced standards.
	(E) B30.6-1995, Derricks.	This standard, currently applicable to derricks in California, is not included in the federal standard.
(3) **ASME B30.7–2001**, Base-Mounted Drum Hoists, issued Jan. 21, 2002 (''ASME B30.7–2001''), IBR approved for § 1926.1436(e).	(F) ASME B30.7–2001, Base-Mounted Drum Hoists, issued Jan. 21, 2002.	CA will adopt federal referenced standards.
	(G) B30.8-1982, Floating Cranes and Floating Derricks (H) B30.11-1980, Monorails and Underhung Cranes (I) B30.13-1977, Controlled Mechanical Storage Cranes	These standards, currently applicable to cranes in California are not included in the federal standard.
(4) **ASME B30.14–2004**, Side Boom Tractors, issued Sept. 20, 2004 (''ASME B30.14–2004''), IBR approved for § 1926.1440(c).	(J) ASME B30.14–2004, Side Boom Tractors, issued Sept. 20, 2004	CA will adopt federal referenced standards.
	(K) B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder,	This standard, currently applicable to cranes in California, is not included in the federal

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	Underhung Hoist).	standard.
(5) ASME Boiler and Pressure Vessel Code, Section VIII, 1968, IBR approved for §§ 1926.152(i), 1926.306(a), and 1926.603(a). (6) ASME Power Boilers, Section I, 1968, IBR approved for § 1926.603(a).		This standard is not relevant to the current adoption.
(m) The following material is available for purchase from the American Welding Society (AWS), 550 N.W. LeJeune Road, Miami, Florida 33126; telephone: 1–800–443–9353; Web site: http://www.aws.org/:	(2) American Welding Society (AWS) standards.	
(1) **AWS D1.1/D1.1M:2002**, Structural Welding Code—Steel, 18th ed., ANSI approved Aug. 31, 2001 (''AWS D1.1/D1.1M:2002''), IBR approved for § 1926.1436(c). (2) **ANSI/AWS D14.3–94**, Specification for Welding Earthmoving and Construction Equipment, ANSI approved Jun. 11, 1993 (''ANSI/AWS D14.3–94''), IBR approved for § 1926.1436(c).	(A) AWS D1.1/D1.1M:2002, Structural Welding Code—Steel, 18th ed., ANSI approved Aug. 31, 2001. (B) ANSI/AWS D14.3–94, Specification for Welding Earthmoving and Construction Equipment, ANSI approved Jun. 11, 1993.	CA will adopt federal referenced standards.
(n) The following material is available for purchase from the British Standards Institution (BSI), 389 Chiswick High Road, London, W4 4AL, United Kingdom; telephone: +44 20 8996 9001; fax: +44 20 8996 7001; e-mail: cservices@bsigroup.com; Web site: http://www.bsigroup.com/:	(3) British Standards Institution (BSI) standards.	
(1) **BS EN 13000:2004**, Cranes—Mobile Cranes, published Jan. 4, 2006 (''BS EN 13000:2004''), IBR approved for § 1926.1433(c). (2) **BS EN 14439:2006**, Cranes—Safety—Tower Cranes, published Jan. 31, 2007 (''BS	(A) BS EN 13000:2004, Cranes—Mobile Cranes, published Jan. 4, 2006. (B) BS EN 14439:2006, Cranes—Safety—Tower Cranes, published Jan. 31, 2007.	CA will adopt federal referenced standards.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
EN 14439:2006''), IBR approved for § 1926.1433(c).		
(o) The following material is available for purchase from the Bureau of Reclamation, United States Department of the Interior, 1849 C Street, NW., Washington DC 20240; telephone: 202–208–4501; Web site: http://www.usbr.gov/: (1) Safety and Health Regulations for Construction, Part II, Sept. 1971, IBR approved for § 1926.1000(f). (p) The following material is available for purchase from the California Department of Industrial Relations, 455 Golden Gate Avenue, San Francisco CA 94102; telephone: (415) 703–5070; email: info@dir.ca.gov; Web site: http://www.dir.ca.gov/: (1) Construction Safety Orders, IBR approved for § 1926.1000(f). (q) [Reserved.] (r) [Reserved.] (s) [Reserved.] (t) [Reserved.] (u) The following material is available for purchase from the Federal Highway Administration, United States Department of Transportation, 1200 New Jersey Ave., SE., Washington, DC 20590; telephone: 202–366–4000; Web site: http://www.fhwa.dot.gov/: (1) Manual on Uniform Traffic Control Devices, Millennium Edition, Dec. 2000, IBR approved for §§ 1926.200(g), 1926.201(a), and 1926.202. (v) The following material is available for purchase from the General Services		These standards are not relevant to the current adoption.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Administration (GSA), 1800 F Street, NW., Washington, DC 20405; telephone: (202) 501–0800; Web site: http://www.gsa.gov/: (1) QQ–P–416, Federal Specification Plating Cadmium (Electrodeposited), IBR approved for § 1926.104(e). (w) The following material is available for purchase from the Institute of Makers of Explosives (IME), 1120 19th Street, NW., Suite 310, Washington, DC 20036; telephone: 202–429–9280; fax: 202–429–9280; e-mail: info@ime.org; Web site: http://www.ime.org/: (1) IME Pub. No. 2, American Table of Distances for Storage of Explosives, Jun. 5, 1964, IBR approved for § 1926.914(a). (2) IME Pub. No. 20, Radio Frequency Energy—A Potential Hazard in the Use of Electric Blasting Caps, Mar. 1968, IBR approved for § 1926.900(k).		
(x) The following material is available for purchase from the International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH–1211 Geneva 20, Switzerland; telephone: +41 22 749 01 11; fax: +41 22 733 34 30; Web site: http://www.iso.org/:	(4) International Organization for Standardization (ISO) standards.	
(1) **ISO 11660–1:2008(E)**, Cranes—Access, guards and restraints—Part 1: General, 2d ed., Feb. 15, 2008 (‘‘ISO 11660–1:2008(E)’’), IBR approved for § 1926.1423(c). (2) **ISO 11660–2:1994(E)**, Cranes—Access, guards and restraints—Part 2: Mobile cranes, 1994 (‘‘ISO 11660–2:1994(E)’’), IBR approved for § 1926.1423(c).	(A) ISO 11660–1:2008(E), Cranes—Access, guards and restraints—Part 1: General, 2d ed., Feb. 15, 2008. (B) ISO 11660–2:1994(E), Cranes—Access, guards and restraints—Part 2: Mobile cranes, 1994. (C) ISO 11660–3:2008(E), Cranes—Access, guards and restraints—Part 3: Tower cranes, 2d	CA will adopt federal referenced standards.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(3) **ISO 11660–3:2008(E)**, Cranes—Access, guards and restraints—Part 3: Tower cranes, 2d ed., Feb. 15, 2008 (''ISO 11660–3:2008(E)''), IBR approved for § 1926.1423(c).	ed., Feb. 15, 2008.	
(y) The following material is available for purchase from the National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169; telephone: 617–770–3000; fax: 617–770–0700; Web site: http://www.nfpa.org/: (1) NFPA 10A–1970, Maintenance and Use of Portable Fire Extinguishers, IBR approved for § 1926.150(c). (2) NFPA 13–1969, Standard for the Installation of Sprinkler Systems, IBR approved for § 1926.152(d). (3) NFPA 30–1969, The Flammable and Combustible Liquids Code, IBR approved for § 1926.152(c). (4) NFPA 80–1970, Standard for Fire Doors and Windows, Class E or F Openings, IBR approved for § 1926.152(b). (5) NFPA 251–1969, Standard Methods of Fire Test of Building Construction and Material, IBR approved for §§ 1926.152(b) and 1926.155(f). (6) NFPA 385–1966, Standard for Tank Vehicles for Flammable and Combustible Liquids, IBR approved for § 1926.152(g). (z) [Reserved.]		These standards are not relevant to the current adoption.
(aa) The following material is available for purchase from the Power Crane and Shovel Association (PCSA), 6737 W. Washington Street, Suite 2400, Milwaukee, WI 53214;	(5) Power Crane and Shovel Association (PCSA) standards.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
telephone: 1–800–369–2310; fax: 414–272–1170; Web site: http://www.aem.org/CBC/ProdSpec/PCSA/:		
(1) PCSA Std. No. 1, Mobile Crane and Excavator Standards, 1968, IBR approved for § 1926.602(b). (2) PCSA Std. No. 2, Mobile Hydraulic Crane Standards, 1968 (''PCSA Std. No. 2 (1968)''), IBR approved for §§ 1926.602(b), 1926.1433(a), and 1926.1501(a). (3) PCSA Std. No. 3, Mobile Hydraulic Excavator Standards, 1969, IBR approved for § 1926.602(b).	(A) PCSA Std. No. 1, Mobile Crane and Excavator Standards, 1968. (B) PCSA Std. No. 2, Mobile Hydraulic Crane Standards, 1968. (C) (3) PCSA Std. No. 3, Mobile Hydraulic Excavator Standards, 1969.	CA will adopt federal referenced standards.
(bb) [Reserved.] (cc) [Reserved.]		
(dd) The following material is available for purchase from the Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096; telephone: 1–877–606–7323; fax: 724–776–0790; Web site: http://www.sae.org/:	(6) Society of Automotive Engineers (SAE) standards.	
(1) SAE 1970 Handbook, IBR approved for § 1926.602(b). (2) SAE 1971 Handbook, IBR approved for § 1926.1001(h). (3) SAE J166–1971, Trucks and Wagons, IBR approved for § 1926.602(a). (4) SAE J168–1970, Protective Enclosures—Test Procedures and Performance Requirements, IBR approved for § 1926.1002(a).		These standards are not relevant to the current adoption.
(5) **SAE J185 (reaf. May 2003)**, Access Systems for Off-Road Machines, reaffirmed	(A) SAE J185 (reaf. May 2003), Access Systems for Off-Road Machines, reaffirmed	CA will adopt the federal referenced standard.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
May 2003 (''SAE J185 (May 1993)''), IBR approved for § 1926.1423(c).	May 2003.	
(6) SAE J236–1971, Self-Propelled Graders, IBR approved for § 1926.602(a). (7) SAE J237–1971, Front End Loaders and Dozers, IBR approved for § 126.602(a). (8) SAE J319b–1971, Self-Propelled Scrapers, IBR approved for § 1926.602(a). (9) SAE J320a–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired, Self-Propelled Scrapers, IBR approved for § 1926.1001(h). (10) SAE J321a–1970, Fenders for Pneumatic-Tired Earthmoving Haulage Equipment, IBR approved for § 1926.602(a). (11) SAE J333a–1970, Operator Protection for Agricultural and Light Industrial Tractors, IBR approved for § 1926.602(a). (11) SAE J386–1969, Seat Belts for Construction Equipment, IBR approved for § 1926.602(a). (12) SAE J394–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Rubber-Tired Front End Loaders and Rubber-Tired Dozers, IBR approved for § 1926.1001(h). (13) SAE J395–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Crawler Tractors and Crawler-Type Loaders, IBR approved for § 1926.1001(h). (14) SAE J396–1971, Minimum Performance Criteria for Roll-Over Protective Structure for Motor Graders, IBR approved for § 1926.1001(h).		These standards are not relevant to the current adoption.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(15) SAE J397–1969, Critical Zone Characteristics and Dimensions for Operators of Construction and Industrial Machinery, IBR approved for § 1926.1001(f). (16) SAE J743a–1964, Tractor Mounted Side Boom, 1964 (''SAE J743a–1964''), IBR approved for § 1926.1501(a). (17) SAE J959–1966, Lifting Crane Wire-Rope Strength Factors, 1966 (''SAE J959–1966''), IBR approved for § 1926.1501(a).		
(18) **SAE J987 (rev. Jun. 2003)**, Lattice Boom Cranes—Method of Test, revised Jun. 2003 (''SAE J987 (Jun. 2003)''), IBR approved for § 1926.1433(c). (19) **SAE J1063 (rev. Nov. 1993)**, Cantilevered Boom Crane Structures—Method of Test, revised Nov. 1993 (''SAE J1063 (Nov. 1993)''), IBR approved for § 1926.1433(c).	(B) SAE J987 (rev. Jun. 2003), Lattice Boom Cranes – Method of Test, revised Jun. 2003. (C) SAE J1063 (rev. Nov. 1993), Cantilevered Boom Crane Structures – Method of Test, revised Nov. 1993.	CA will adopt federal referenced standards.
(ee) The following material is available for purchase from the United States Army Corps of Engineers, 441 G Street, NW., Washington, DC 20314; telephone: 202–761–0011; e-mail: hqpublicaffairs@usace.army.mil; Web site: http://www.usace.army.mil/: (1) EM–385–1–1, General Safety Requirements, Mar. 1967, IBR approved for § 1926.1000(f). (ff) The following material is available for purchase from standards resellers such as the Document Center Inc., 111 Industrial Road, Suite 9, Belmont, CA 94002; telephone: 650–591–7600; fax: 650–591–7617; e-mail: info@documentcenter.com; Web site: http://www.document-center.com/:		These standards are not relevant to the current adoption.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) ANSI B15.1–1953 (R1958), Safety Code for Mechanical Power-Transmission Apparatus, revised 1958, IBR approved for §§ 1926.300(b)(2) and 1926.1501(a). (2) ANSI B30.2.0–1967, Safety Code for Overhead and Gantry Cranes, approved May 4, 1967, IBR approved for § 1926.1501(d). (3) ANSI B30.5–1968, Crawler, Locomotive, and Truck Cranes, approved Dec. 16, 1968, IBR approved for §§ 1926.1433(a), 1926.1501(a), and 1926.1501(b). (4) ANSI B30.6–1969, Safety Code for Derricks, approved Dec. 18, 1967, IBR approved for § 1926.1501(e).		
Subpart C—General Safety and Health Provisions		
3. The authority citation for subpart C of 29 CFR part 1926 is retained as follows: …		CA cites authority at each section.
§ 1926.31 [Reserved.] 4. Section 1926.31 is removed and reserved.		Section 1926.31, Incorporation by Reference, relocated to Subpart A, Section 1926.6. N/A for CA due to differences in formatting.
Subpart L—Scaffolds		
5. The authority citation for subpart L of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
6. Section 1926.450 is amended by revising paragraph (a) to read as follows:		
§ 1926.450 Scope, application, and definitions applicable to this subpart. (a) *Scope and application.* This subpart applies to all scaffolds used in workplaces covered by this part. It does not apply to crane or derrick suspended personnel platforms. The criteria for		Deletes reference to "…which are covered by § 1926.550(g)." [Subpart N – Cranes, Derricks, Hoists, Elevators, and Conveyors] This is due to relocation of Cranes and Derricks to Subpart CC. N/A for CA due to differences in formatting.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
aerial lifts are set out exclusively in § 1926.453.		
Subpart M—Fall Protection		
7. The authority citation for subpart M of 29 CFR part 1926 is revised to read as follows:…		CA cites authority at each section.
8. Section 1926.500 is amended by revising paragraph (a)(2)(ii), adding paragraph (a)(3)(v), and revising paragraph (a)(4), to read as follows: § 1926.500 Scope, application, and definitions applicable to this subpart. (a) * * * (2) * * * (ii) Requirements relating to fall protection for employees working on cranes and derricks are provided in subpart CC of this part. * * * * * (3) * * *		CA fall protection standards are horizontal.
(v) Criteria for steps, handholds, ladders, and grabrails/guardrails/railings required by subpart CC are provided in subpart CC. Sections 1926.502(a), (c) through (e), and (i) apply to activities covered under subpart CC unless otherwise stated in subpart CC. No other paragraphs of § 1926.502 apply to subpart CC. * * * * *		CA standards for stairs, ladders and guardrails are horizontal.
(4) Section 1926.503 sets forth requirements for training in the installation and use of fall protection systems, except in relation to steel erection activities and the use of equipment covered by subpart CC.		CA has horizontal training standards (which include fall protection) in Sections 1509 and 3203.
Subpart DD—Cranes and Derricks Used in Demolition and Underground Construction		CA Construction standards for cranes and derricks used in demolition and underground

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
		construction are contained in CSO Group 15 which follows.
9. New subpart DD, consisting of § 1926.1500 is added to read as follows:		
Subpart DD—Cranes and Derricks Used in Demolition and Underground Construction		
Authority: Section 3704 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701); Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order Nos. 12–71 (36 FR 8754), 8–76 (41 FR 25059), or 9–83 (49 FR 35736), and 5–2007 (72 FR 31159).		CA cites authority at each section.
§ 1926.1500 Scope. This subpart applies only to employers engaged in demolition work covered by § 1926.856 and § 1926.858, and underground construction work covered by § 1926.800. This subpart applies in lieu of § 1926 subpart CC.		CA standards for cranes and derricks used in demolition and underground construction are horizontal. See Article 15.
Subpart N—Cranes, Derricks, Hoists, Elevators, and Conveyors		Formatting change not applicable to CA standards.
10. The authority citation for subpart N of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
11. The heading to subpart N of 29 CFR part 1926 is revised to read as follows:		
Subpart N—Helicopters, Hoists, Elevators, and Conveyors * * * * *		Formatting change not applicable to CA standards.
§ 1926.550 [Redesignated as § 1926.1501]		
12. Section 1926.550 is redesignated as § 1926.1501 in subpart DD.		Formatting change not applicable to CA standards.
§ 1926.550 [Reserved]		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
13. Section 1926.550 is reserved.		
14. Section 1926.553 is amended by adding paragraph (c) to read as follows: § 1926.553 Base-mounted drum hoists. * * * * * (c) This section does not apply to base-mounted drum hoists used in conjunction with derricks. Base-mounted drum hoists used in conjunction with derricks must conform to § 1926.1436(e).		N/A for CA due to differences in formatting and precedence of orders.
Subpart O—Motorized Vehicles, Mechanical Equipment, and Marine Operations		
15. The authority citation for subpart O of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
16. Section 1926.600 is amended by revising paragraph (a)(6) to read as follows:		
§ 1926.600 Equipment. (a) General Requirements. * * * (6) All equipment covered by this subpart shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines: (i) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet; (ii) For lines rated over 50 kV, minimum clearance between the lines and any part of the		All these provisions are covered in federal sections 1926.1408 and 1409, Tables A and T, which will be incorporated in State CSO Article 15, sections 1612.1 and 1612.4.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
crane or load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet; (iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV, and 10 feet for voltages over 50 kV, up to and including 345 kV, and 16 feet for voltages up to and including 750 kV; (iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means; (v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation; (vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded; (vii) Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages: (A) The equipment shall be provided with an		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
electrical ground directly to the upper rotating structure supporting the boom; and (B) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load. (C) Combustible and flammable materials shall be removed from the immediate area prior to operations.		
Subpart R—Steel Erection		CA counterpart is Title 8, Chapter 4, Subchapter 4, Construction Safety Orders, Section 1710.
17. The authority citation for subpart R of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
18. Section 1926.753 is amended by revising paragraphs (a) and (c)(4) to read as follows:		
§ 1926.753 Hoisting and rigging. (a) All the provisions of subpart CC apply to hoisting and rigging with the exception of § 1926.1431(a). * * * * * (c) * * * (4) Cranes or derricks may be used to hoist employees on a personnel platform when work under this subpart is being conducted, provided that all provisions of § 1926.1431 (except for § 1926.1431(a)) are met. * * * * *		CA construction standards for cranes and derricks are horizontal. No need to amend Steel Erection. See CA counterpart for §1926.1431 to follow.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Subpart S—Underground Construction, Caissons, Cofferdams, and Compressed Air		CA counterparts are: Tunnel Safety Orders (CSO) and Pressurized Worksite Operations (Caissons – GISO).
19. The authority citation for subpart S of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
20. Section 1926.800 is amended by revising paragraph (t) to read as follows:		
§ 1926.800 Underground construction. * * * * * (t) Hoisting unique to underground construction. Employers must comply with § 1926.1501(g) of § 1926 subpart DD. Except as modified by this paragraph (t), the following provisions of subpart N of this part apply: Requirements for material hoists are found in §§ 1926.552(a) and (b) of this part. Requirements for personnel hoists are found in the personnel hoists requirements of §§ 1926.552(a) and (c) of this part and in the elevator requirement of §§ 1926.552(a) and (d) of this part. * * * * *		Formatting changes not applicable to CA standards, since construction (CSO) and general industry (GISO) standards for cranes are horizontal.
Subpart T—Demolition		
21. The authority citation for subpart S of 29 CFR part 1926 is revised to read as follows: …		CA cites authority at each section.
22. Section 1926.856 is amended by revising paragraph (c) to read as follows: § 1926.856 Removal of walls, floors, and material with equipment. * * * * * (c) Mechanical equipment used shall meet the requirements specified in subparts N and O and § 1926.1501 of § 1926 subpart DD.		Formatting changes not applicable to CA standards, since CA crane standards are horizontal.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
23. Section 1926.858 is amended by revising paragraph (b) to read as follows: § 1926.858 Removal of walls, floors, and material with equipment. * * * * * (b) Cranes, derricks, and other hoisting equipment used shall meet the requirements specified in § 1926.1501 of § 1926 subpart DD.		Formatting changes not applicable to CA standards, since CA crane standards are horizontal.
Subpart V—Power Transmission and Distribution		CA counterpart is Title 8, Chapter 4, Subchapter 5, Electrical Safety Orders, Group 2, High-Voltage Electrical Safety Orders.
24. The authority citation for subpart V of part 1926 is revised to read as follows: …		CA cites authority at each section.
25. Section 1926.952 is amended by revising paragraph (c) to read as follows: § 1926.952 Mechanical equipment. *** * * * ***		CA counterpart for 1926.952 is Title 8, Chapter 4, Subchapter 5, Group 2, High-Voltage Electrical Safety Orders, §2940.7. Note: CA Electrical Safety Orders apply both to construction and general industry.
(c) Cranes and other lifting equipment.	§2940.7(c) Derrick Trucks, Cranes and Other Lifting Equipment.	CA counterpart is High-Voltage Electrical Safety Orders, §2940.7(c)
(1) All equipment shall comply with subparts CC and O of this part, as applicable.		All Title 8 standards apply where applicable.
(2) Digger derricks used for augering holes for poles carrying electric lines, placing and removing poles, or for handling associated materials to be installed or removed from the poles must comply with 29 CFR 1910.269.		CA counterpart for §1910.269 is Title 8, Chapter 4, Subchapter 5, Group 2, High-Voltage Electrical Safety Orders (HVESO), and more specifically §2940.7(c) for digger derricks (see rows below). 29 CFR 1910.269 contains provisions for liveline-barehand work which have not been adopted by CA (CA does not allow liveline-barehand except by variance application).
	§2940.7(c) Derrick Trucks, Cranes and Other	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	Lifting Equipment. ***	
(3) With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized line or equipment than the clearances set forth in § 1926.950(c) unless, in addition to the requirements in § 1926.1410:	(2) With the exception of equipment certified for work on the proper voltage, mechanical equipment shall not be operated closer to any energized conductor or exposed energized parts of equipment than the clearances set forth in Section 2940.2(b) Table 2940.2 unless, in addition to the requirements of 1612.3.	
	(A) An insulated barrier is installed between the energized part and the mechanical equipment, or	
(i) The mechanical equipment is insulated, or	(B) The mechanical equipment is insulated.	
(ii) The mechanical equipment is considered as energized. Note to paragraph (c)(3): In accordance with 29 CFR 1926.1400(g), compliance with 29 CFR 1910.269(p) will be deemed compliance with §§ 1926.1407 through 1926.1411, including § 1926.1410.		1926.952(c)(3)(ii) is not permitted in CA. Section 2940.7(c)(2) (shown above) is more protective than 1926.952(c)(3)(ii).
Subpart X—Stairways and Ladders	§1629. Stairways and Ladders.	
26. The authority citation for subpart X of 29 CFR part 1926 is amended by revising paragraph (a) to read as follows: …		CA cites authority at each section.
27. Section 1926.1050 is amended by revising paragraph (a) to read as follows:		
§ 1926.1050 Scope, application, and definitions applicable to this subpart.		
(a) Scope and application. This subpart applies to all stairways and ladders used in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under 29 CFR part 1926,		The subject of stairways and ladders is covered in CSO and GISO horizontal standards. CA does not exclude cranes and derricks from the provisions of CSO §1629, Stairways and Ladders and GISO §3234, Fixed Industrial

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
and also sets forth, in specified circumstances, when ladders and stairways are required to be provided. Additional requirements for ladders used on or with scaffolds are contained in subpart L—Scaffolds. This subpart does not apply to integral components of equipment covered by subpart CC. Subpart CC exclusively sets forth the circumstances when ladders and stairways must be provided on equipment covered by subpart CC.		Stairs as applicable.
Appendix A to Part 1926—Designations for General Industry Standards Incorporated into Body of Construction Standards		
28. Appendix A to part 1926 is amended by removing the row containing ‘‘1926.550(a)(19)’’ and ‘‘1910.184(c)(9)’’ from the table ‘‘1926 DESIGNATIONS FOR APPLICABLE 1910 STANDARDS.’’		Formatting changes not applicable to CA standards.
Subparts AA and BB—[Reserved]		
29. Subparts AA and BB are reserved and subpart CC is added to read as follows:		Formatting changes not applicable to CA standards.
Subpart CC—Cranes and Derricks in Construction		CA counterpart is Title 8, Chapter 4, Subchapter 4, Construction Safety Orders, new Group 15, Cranes and Derricks in Construction.
Sec. 1926.1400 Scope. 1926.1401 Definitions. 1926.1402 Ground conditions. 1926.1403 Assembly/Disassembly—selection of manufacturer or employer procedures.		The CSO will be prefaced by index to be provided by Barklays.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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). 1926.1406 Assembly/Disassembly—employer procedures—general requirements. 1926.1407 Power line safety (up to 350 kV)—assembly and disassembly. 1926.1408 Power line safety (up to 350 kV)—equipment operations. 1926.1409 Power line safety (over 350 kV). 1926.1410 Power line safety (all voltages)—equipment operations closer than the Table A zone. 1926.1411 Power line safety—while traveling. 1926.1412 Inspections. 1926.1413 Wire rope—inspection. 1926.1414 Wire rope—selection and installation criteria. 1926.1415 Safety devices. 1926.1416 Operational aids. 1926.1417 Operation. 1926.1418 Authority to stop operation. 1926.1419 Signals—general requirements. 1926.1420 Signals—radio, telephone or other electronic transmission of signals. 1926.1421 Signals—voice signals—additional requirements. 1926.1422 Signals—hand signal chart. 1926.1423 Fall protection. 1926.1424 Work area control.		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.1425 Keeping clear of the load. 1926.1426 Free fall and controlled load lowering. 1926.1427 Operator qualification and certification. 1926.1428 Signal person qualifications. 1926.1429 Qualifications of maintenance & repair employees. 1926.1430 Training. 1926.1431 Hoisting personnel. 1926.1432 Multiple-crane/derrick lifts—supplemental requirements. 1926.1433 Design, construction and testing. 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. 1926.1439 Dedicated pile drivers. 1926.1440 Sideboom cranes. 1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less. 1926.1442 Severability. Appendix A to Subpart CC of part 1926—Standard Hand Signals Appendix B to Subpart CC of part 1926—Assembly/Disassembly—Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement Appendix C to Subpart CC of part 1926—Operator Certification—Written Examination—Technical Knowledge Criteria		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Subpart CC—Cranes and Derricks in Construction	Construction Safety Orders, Article 15, Cranes and Derricks in Construction.	
§ 1926.1400 Scope.	§1610.1. Scope.	
(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.	(a) This Article 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 subsection (c) of this section are excluded from the scope of this standard.	
(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	(b) Attachments. This Article applies to equipment included in subsection (a) 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
lines, personnel platforms, augers or drills and pile driving equipment.	platforms, augers or drills and pile driving equipment.	
(c) Exclusions. This subpart does not cover: (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. (2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.	(c) Exclusions. This Article does not cover: (1) Machinery included in subsection (a) while it has been converted or adapted for a non-hoisting/lifting use. Such conversions/ adaptations include, but are not limited to, power shovels, excavators and concrete pumps. (2) Power shovels, excavators, wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads. (3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.	
(4) Digger derricks when used for augering holes for poles carrying electric and telecommunication lines, placing and removing the poles, and for handling associated materials to be installed on or removed from the poles. Digger derricks used in work subject to 29 CFR part 1926, subpart V, must comply with 29 CFR 1910.269. Digger derricks used in construction work for telecommunication service (as defined at 29 CFR 1910.268(s)(40)) must comply with 29 CFR 1910.268.	(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. (A) Digger derricks used in work subject to The Electrical Safety Orders shall comply with Section 2940.7 of those Safety Orders. (B) Digger derricks used in construction work for telecommunication service (as defined in the Telecommunication Safety Orders) shall comply with those Safety Orders.	The ESO and TCSO correspond to 1926 subpart Part V and with 1910.268 respectively.
(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes. (8) Powered industrial trucks (forklifts), except	(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes. (8) Powered industrial trucks (forklifts), except	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.	when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.	
(9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.	(9) Mechanic's truck with a hoisting device when used in activities related to equipment maintenance and repair.	
(10) Machinery that hoists by using a come-a-long or chainfall. (11) Dedicated drilling rigs. (12) Gin poles when used for the erection of communication towers.	(10) Machinery that hoists by using a come-a-long or chainfall. (11) Dedicated drilling rigs. (12) Gin poles when used for the erection of communication towers.	
(13) Tree trimming and tree removal work.		California is more protective; i.e., crane operators for tree trimming and removal are currently required to be certified. Use of cranes for tree trimming and removal is covered under GISO Article 12, Section 3427.
(14) Anchor handling or dredge related operations with a vessel or barge using an affixed A-frame. (15) Roustabouts. (16) Helicopter cranes.	(13) Anchor handling or dredge related operations with a vessel or barge using an affixed A-frame. (14) Roustabouts. (15) Helicopter cranes.	
(17) Material Delivery (i) Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting. (ii) Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a		See 1618.1 Exception 2 which provides a limited exception for the material delivery.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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 does not apply when: (A) The articulating/knuckle-boom crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure; (B) The material being handled by the articulating/knuckle-boom crane is a prefabricated component. Such prefabricated components include, but are not limited to: Precast concrete members or panels, roof trusses (wooden, cold-formed metal, steel, or other material), prefabricated building sections such as, but not limited to: Floor panels, wall panels, roof panels, roof structures, or similar items; (C) The material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building (as defined in 29 CFR 1926 subpart R). (D) The activity is not specifically excluded under § 1400(c)(17)(i) and (ii).		
(d) All sections of this subpart CC apply to the equipment covered by this standard unless specified otherwise.	1610.1(d) All sections of this Article 15 apply to the equipment covered by this Article unless specified otherwise.	
(e) The duties of controlling entities under this		This subsection is redundant and unnecessary

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
subpart include, but are not limited to, the duties specified in § 1926.1402(c), § 1926.1402(e) and § 1926.1424(b).		under CA law.
(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.		Employer responsibilities are covered by Section 3203.
(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.	1610.1(e) For work covered by the High-Voltage Electrical Safety Orders, compliance with those Orders is deemed compliance with Section 1611.5 and Sections 1612.1 through 1612.4	
(h) Section 1926.1402 does not apply to cranes designed for use on railroad tracks, when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213, and that comply with applicable Federal Railroad Administration requirements. See §1926.1402(f).	(f) Section 1610.5 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 Section 1610.5(f).	
§ 1926.1401 Definitions.	§1610.3. Definitions.	
A/D director (Assembly/Disassembly director) means an individual 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.	A/D Director (Assembly/Disassembly Director). An individual who meets this section'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.	
Articulating crane means a crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to	Articulating Crane. A crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
extend or retract by power from hydraulic cylinders.	extend or retract by power from hydraulic cylinders.	
Assembly/Disassembly means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, ‘‘erecting and climbing’’ replaces the term ‘‘assembly,’’ and ‘‘dismantling’’ replaces the term ‘‘disassembly.’’ Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.	Assembly/Disassembly. 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.	
Assist crane means a crane used to assist in assembling or disassembling a crane.	Assist Crane. A crane used to assist in assembling or disassembling a crane.	
Attachments means any device that expands the range of tasks that can be done by the equipment. Examples include, but are not limited to: An auger, drill, magnet, pile-driver, and boom-attached personnel platform.	Attachment(s). 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.	
Audible signal means a signal made by a distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.	Audible Signal. 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.	
Blocking (also referred to as ‘‘cribbing’’) is wood or other material used to support equipment or a component and distribute loads to the ground. It is typically used to support lattice boom sections during assembly/ disassembly and under outrigger and stabilizer floats.	Blocking (also referred to as “cribbing”) 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.	
Boatswain’s chair means a single-point adjustable suspension scaffold consisting of a seat or sling (which may be incorporated into a full body harness) designed to support one employee in a sitting position.	Boatswain’s Chair. 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Bogie means ‘‘travel bogie,’’ which is defined below.	Bogie. See “Trolley (Travel Bogie),” which is defined below.	Fed definition modified for actual location in the definitions.
	Boom. A member section of a crane or derrick, the lower end of which is affixed to a mast, base, carriage, or support, and the upper end supports a hook or other end attachment. The length of the boom shall be taken as the straight line distance between the axis of the foot pin and the axis of the end sheave pin.	This definition, copied from T8 GISO Section 4884, added for clarity.
Boom (equipment other than tower crane) means an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	Boom (equipment other than tower crane). An inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	
Boom (tower cranes): On tower cranes, if the ‘‘boom’’ (i.e., principal horizontal structure) is fixed, it is referred to as a jib; if it is moveable up and down, it is referred to as a boom.	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.	
Boom angle indicator means a device which measures the angle of the boom relative to horizontal.	Boom angle indicator. A device which measures the angle of the boom relative to horizontal.	
Boom hoist limiting device includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent	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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
the boom from lowering after power is disengaged.	the boom from lowering after power is disengaged.	
Boom length indicator indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	Boom length indicator. Indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	
Boom stop includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.	Boom stop. Includes boom stops, (belly straps with struts/standoff), telescoping boom stops, attachment boom stops, and backstops. These devices restrict the boom from moving above a certain maximum angle and toppling over backward.	
Boom suspension system means a system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	Boom suspension system. A system of pendants, running ropes, sheaves, and other hardware which supports the boom tip and controls the boom angle.	
Builder means the builder/constructor of equipment.	Builder. The builder/constructor of equipment.	
Center of gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.	Center of gravity: The center of gravity of any object is the point in the object around which its weight is evenly distributed. If you could put a support under that point, you could balance the object on the support.	
	Certificating Agency. Certificating agencies are qualified agencies, and/or persons, licensed by the Division to examine, test and certify cranes and derricks in accordance with Sections 344.60 through 344.67 of Title 8 of the California Code of Regulations.	These existing CA GISO Section 4885 definitions are included for consistency with CA Labor Law (they are used extensively in inspection and testing standards).
	Certified Agent. The manufacturer, or a person who is currently registered as a professional civil, mechanical, or structural engineer by the State of California and is knowledgeable in the	These existing CA GISO Section 4885 definitions are included for consistency with CA Labor Law (they are used extensively in inspection and testing standards).

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	structure and use of the equipment.	
Certified welder means a welder who meets nationally recognized certification requirements applicable to the task being performed.	Certified welder. A welder who meets nationally recognized certification requirements applicable to the task being performed.	
Climbing means the process in which a tower crane is raised to a new working height, either by adding additional tower sections to the top of the crane (top climbing), or by a system in which the entire crane is raised inside the structure (inside climbing).	Climbing. 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).	
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.	Come-a-long. A mechanical device typically consisting of a chain or cable attached at each end that is used to facilitate movement of materials through leverage.	
Competent person means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.	Competent person. A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.	
Controlled load lowering means lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.	Controlled load lowering. Lowering a load by means of a mechanical hoist drum device that allows a hoisted load to be lowered with maximum control using the gear train or hydraulic components of the hoist mechanism. Controlled load lowering requires the use of the hoist drive motor, rather than the load hoist brake, to lower the load.	
Controlling entity means an employer that is a prime contractor, general contractor, construction manager or any other legal entity which has the overall responsibility for the construction of the project—its planning, quality and completion.	Controlling entity. 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Counterweight means a weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.	Counterweight. A weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.	
Crane/derrick includes all equipment covered by this subpart.	Crane. A machine for lifting or lowering a load and moving it horizontally, in which the hoisting mechanism is an integral part of the machine. It may be driven manually or by power and may be a fixed or a mobile machine, but does not include stackers, lift trucks, power shovels, backhoes, or excavators. Some of the common types of cranes are defined as follows: (A) Boom-Type Mobile Crane. A self-propelled crane equipped with a boom and mounted on a chassis which is supported on either rubber tires, crawler treads or railway wheels running on railroad tracks. (B) Cantilever Gantry Crane. A crane in which the bridge girders or trusses are extended transversely beyond the crane runway on one or both sides. Its runway may be either on the ground or elevated.	Existing GISO Section 4885 definitions copied into CSO 1610.3 for consistency with GISO and for clarity.
Crawler crane means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.	(C) Crawler Crane. A crane consisting of a superstructure with power plant, operating machinery and boom, mounted on a base, equipped with crawler treads for travel. ***	Existing GISO section 4885 definition for "Crawler Crane" copied into 1610.3 for clarity.
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.	Crossover points. 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Dedicated channel means a line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).	Dedicated channel. A line of communication assigned by the employer who controls the communication system to only one signal person and crane/derrick or to a coordinated group of cranes/derricks/signal person(s).	
Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.	Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the ability to both hoist the material that will be pile-driven and to pile-drive that material.	
Dedicated spotter (power lines): To be considered a dedicated spotter, the requirements of § 1926.1428 (Signal person qualifications) must be met and his/her sole responsibility is to watch the separation between the power line and the equipment, load line and load (including rigging and lifting accessories), and ensure through communication with the operator that the applicable minimum approach distance is not breached.	Dedicated spotter (power lines): To be considered a dedicated spotter, the requirements of Section 1618.2 (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.	
	Derrick. An apparatus consisting of a mast or equivalent member held at the top by guys or braces, with or without a boom, for use with a hoisting mechanism and operating rope, for lifting or lowering a load and moving it horizontally. ***	Existing GISO Section 4885 definitions copied into CSO 1610.3 for consistency with GISO and for clarity.
Directly under the load means a part or all of an employee is directly beneath the load.	Directly under the load. A part or all of an employee is directly beneath the load.	
Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).	Dismantling. Includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Drum rotation indicator means a device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	Drum rotation indicator. A device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	
Electrical contact occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.	Electrical contact. Occurs when a person, object, or equipment makes contact or comes in close proximity with an energized conductor or equipment that allows the passage of current.	
Employer-made equipment means floating cranes/derricks designed and built by an employer for the employer's own use.	Employer-made equipment. Floating cranes/derricks designed and built by an employer for the employer's own use.	
Encroachment is where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this subpart requires to be maintained from a power line.	Encroachment. Where any part of the crane, load line or load (including rigging and lifting accessories) breaches a minimum clearance distance that this Article 15 requires to be maintained from a power line.	
Equipment means equipment covered by this subpart.		Unnecessary, and may actually result in less effective standard since it restricts the definition of "equipment."
Equipment criteria means instructions, recommendations, limitations and specifications.	Equipment criteria. Instructions, recommendations, limitations and specifications.	
Fall protection equipment means guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	Fall protection equipment. Guardrail systems, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.	Fall protection is more thoroughly described in CSO Article 24.
Fall restraint system means a fall protection system that prevents the user from falling any distance. The system is comprised of either a body belt or body harness, along with an anchorage, connectors and other necessary equipment. The other components typically include a lanyard, and may also include a lifeline and other devices.	Fall restraint system. 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	Fall zone. 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.	
Flange points are points of contact between rope and drum flange where the rope changes layers.	Flange points. Points of contact between rope and drum flange where the rope changes layers.	
Floating cranes/derricks means equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.	Floating cranes/derricks. Equipment designed by the manufacturer (or employer) for marine use by permanent attachment to a barge, pontoons, vessel or other means of flotation.	
For example means ‘‘one example, although there are others.’’	For example means “one example, although there are others.”	
Free fall (of the load line) means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).	Free fall (of the load line) means that only the brake is used to regulate the descent of the load line (the drive mechanism is not used to drive the load down faster or retard its lowering).	
Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel’s transverse stability.	Free surface effect is the uncontrolled transverse movement of liquids in compartments which reduce a vessel’s transverse stability.	
Hoist means a mechanical device for lifting and lowering loads by winding a line onto or off a drum.	Hoist. A mechanical device for lifting and lowering loads by winding a line onto or off a drum.	
Hoisting is the act of raising, lowering or otherwise moving a load in the air with equipment covered by this standard. As used in this standard, ‘‘hoisting’’ can be done by means other than wire rope/hoist drum equipment.	Hoisting. 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.	
Include/including means ‘‘including, but not limited to.’’	Include/including means “including, but not limited to.”	
Insulating link/device means an insulating device listed, labeled, or accepted by a	Insulating link/device. An insulating device listed, labeled, or accepted by a Nationally	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	
Jib stop (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.	Jib stop (also referred to as a jib backstop), is the same type of device as a boom stop but is for a fixed or luffing jib.	
Land crane/derrick is equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.	Land crane/derrick. Equipment not originally designed by the manufacturer for marine use by permanent attachment to barges, pontoons, vessels, or other means of floatation.	
List means the angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	List. The angle of inclination about the longitudinal axis of a barge, pontoons, vessel or other means of floatation.	
Load refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.	Load refers to the object(s) being hoisted and/or the weight of the object(s); both uses refer to the object(s) and the load-attaching equipment, such as, the load block, ropes, slings, shackles, and any other ancillary attachment.	
Load moment (or rated capacity) indicator 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 indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.	Load moment (or rated capacity) indicator. 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 indicates to the operator the percentage of capacity at which the equipment is working. Lights, bells, or buzzers may be incorporated as a warning of an approaching overload condition.	
Load moment (or rated capacity) limiter means a system which aids the equipment operator by sensing (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	Load moment (or rated capacity) limiter. 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	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.	
Locomotive crane means a crane mounted on a base or car equipped for travel on a railroad track.	Locomotive crane. A crane mounted on a base or car equipped for travel on a railroad track.	
Luffing jib limiting device is similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	Luffing jib limiting device. Similar to a boom hoist limiting device, except that it limits the movement of the luffing jib.	
Marine hoisted personnel transfer device means a device, such as a ‘‘transfer net,’’ that is designed to protect the employees being hoisted during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain’s chairs when hoisted by equipment covered by this standard.	Marine hoisted personnel transfer device. A device, such as a ‘‘transfer net,’’ that is designed to protect the employees being hoisted during a marine transfer and to facilitate rapid entry into and exit from the device. Such devices do not include boatswain’s chairs when hoisted by equipment covered by this standard.	
Marine worksite means a construction worksite located in, on or above the water.	Marine worksite. A construction worksite located in, on or above the water.	
Mobile crane means a lifting device incorporating a cable suspended latticed boom or hydraulic telescopic boom designed to be moved between operating locations by transport over the road.	Mobile crane. 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.	
Moving point-to-point means the times during which an employee is in the process of going to or from a work station.	Moving point-to-point means the times during which an employee is in the process of going to or from a work station.	
Multi-purpose machine means a machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means	Multi-purpose machine. A machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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 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.	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 covered by this standard. 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 standard.	
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.	§1618.1. Operator Qualification and Certification. *** (b)(3) Accredited Certifying Entity. A certifying entity is any organization whose certification program is accredited by either the National Commission for Certifying Agencies (NCCA), or the American National Standards Institute (ANSI). ANSI accreditation shall be in accordance with the requirements of the ANSI, International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) 17024:2003(E), Conformity Assessment-General Requirements for Bodies Operating Certification of Persons, which is hereby incorporated by reference.	"Nationally recognized accrediting agency" is defined in 1618.1(b)(3)
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	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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
to the passage of current under the conditions of use).	to the passage of current under the conditions of use).	
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’’).	Operational aids. 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 Section 1615.2 (“listed operational aids”).	
Operational controls means levers, switches, pedals and other devices for controlling equipment operation.	Operational controls. Levers, switches, pedals and other devices for controlling equipment operation.	
Operator means a person who is operating the equipment.	Operator. A person who is operating the equipment.	
Overhead and gantry cranes includes overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.	Overhead and gantry cranes. Includes overhead/bridge cranes, semi-gantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment, irrespective of whether it travels on tracks, wheels, or other means.	
Paragraph refers to a paragraph in the same section of this subpart that the word ‘‘paragraph’’ is used, unless otherwise specified.		CA standards use “section” rather than “paragraph.”
Pendants includes both wire and bar types. Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. Bar type: Instead of wire rope, a bar is used. Pendants are typically used in a latticed boom crane system to easily change the length of the boom suspension system without completely changing the rope on the drum when the boom length is increased or decreased.	Pendants. (A) Wire type: A fixed length of wire rope with mechanical fittings at both ends for pinning segments of wire rope together. (B) 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	S. 1504. Personal Fall Arrest System. A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.	Use existing state definition located in Section 1504.
Portal crane is a type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	Portal crane (Whirly Type). A type of crane consisting of a rotating upper-structure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	This definition located under 1610.3, Cranes, Portal Crane..
Power lines means electric transmission and distribution lines.	Power lines. Electric transmission and distribution lines.	
Procedures include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.	Procedures. Include, but are not limited to: Instructions, diagrams, recommendations, warnings, specifications, protocols and limitations.	
Proximity alarm is a device that provides a warning of proximity to a power line and that has been listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	Proximity alarm. 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, or approved in accordance with Section 1505.	
Qualified evaluator (not a third party) means a person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal	Qualified evaluator (not a third party). A person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this Article 15 for a signal person.	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
person.		
Qualified evaluator (third party) means an entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	Qualified evaluator (third party). An entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this Article 15 for a signal person.	
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.	S 1504. Qualified Person, Attendant or Operator. A person designated by the employer who by reason of his training and experience has demonstrated his ability to safely perform his duties and, where required, is properly licensed in accordance with federal, state, or local laws and regulations.	California has a single definition for "qualified person" which applies horizontally. For cranes, California uses certified agents, certificating agencies, and, in some cases, RPE's for tasks which the federal standards delegate to qualified persons. Thus California standards are more protective.
Qualified rigger is a rigger who meets the criteria for a qualified person.	Qualified rigger is a rigger who meets the criteria for a qualified person.	
Range control limit device is a device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.	Range control limit device. A device that can be set by an equipment operator to limit movement of the boom or jib tip to a plane or multiple planes.	
Range control warning device is a device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.	Range control warning device. A device that can be set by an equipment operator to warn that the boom or jib tip is at a plane or multiple planes.	
Rated capacity means the maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	Rated capacity. The maximum working load permitted by the manufacturer under specified working conditions. Such working conditions typically include a specific combination of factors such as equipment configuration, radii, boom length, and other parameters of use.	
Rated capacity indicator: See load moment indicator.	Rated capacity indicator: See load moment indicator.	
Rated capacity limiter: See load moment	Rated capacity limiter: See load moment	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
limiter.	limiter.	
Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	
Running wire rope means a wire rope that moves over sheaves or drums.	Running wire rope. A wire rope that moves over sheaves or drums.	
Runway means a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the crane being used to lift and travel with the crane suspended platform. An existing surface may be used as long as it meets these criteria.	Runway. 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.	
Section means a section of this subpart, unless otherwise specified.		Not applicable for CA formatting.
Sideboom crane means a track-type or wheel-type tractor having a boom mounted on the side of the tractor, used for lifting, lowering or transporting a load suspended on the load hook. The boom or hook can be lifted or lowered in a vertical direction only.	Sideboom crane. 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.	
Special hazard warnings means warnings of site-specific hazards (for example, proximity of power lines).	Special hazard warnings. Warnings of site-specific hazards (for example, proximity of power lines).	
Stability (flotation device) means the tendency of a barge, pontoons, vessel or other means of flotation to return to an upright position after having been inclined by an external force.	Stability (flotation device). 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.	
Standard Method means the protocol in Appendix A of this subpart for hand signals.	Standard Method means the protocol in General Industry Safety Orders, Section 5001, Plate I, for hand signals.	
Such as means ‘‘such as, but not limited to.’’		CA spells this out wherever “such as” is used.
Superstructure: See Upperworks.	Superstructure: See “Upperworks.”	
Tagline means a rope (usually fiber) attached to	Tagline. A rope (usually fiber) attached to a	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	
Tender means an individual responsible for monitoring and communicating with a diver.	Tender. An individual responsible for monitoring and communicating with a diver.	
Tilt up or tilt down operation means raising/lowering a load from the horizontal to vertical or vertical to horizontal.	Tilt up or tilt down operation. Raising/lowering a load from the horizontal to vertical or vertical to horizontal.	
Tower crane is a type of lifting structure which utilizes a vertical mast or tower to support a working boom (jib) in an elevated position. Loads are suspended from the working boom. While the working boom may be of the fixed type (horizontal or angled) or have luffing capability, it can always rotate to swing loads, either by rotating on the top of the tower (top slewing) or by the rotation of the tower (bottom slewing). The tower base may be fixed in one location or ballasted and moveable between locations. Mobile cranes that are configured with luffing jib and/or tower attachments are not considered tower cranes under this section.	S. 1610.3 definition "for tower crane" *** (V) Tower Crane. A crane in which a boom, swinging jib or other structural member is mounted on a vertical mast or tower. (1) Tower Crane (Climber). A crane erected upon and supported by a building or other structure which may be raised or lowered to different floors or levels of the building or structure. (2) Tower Crane (Free Standing). A crane with a horizontally swinging, usually non-luffing boom which may be on a fixed base or mounted on rails. (3) Tower Crane (Mobile). A tower crane which is mounted on a crawler, truck or similar carrier for travel or transit. (4) Tower Crane (Self-Erector). A mobile tower crane that is truck carrier mounted and capable of self-erection.	These definitions have been copied from GISO Section 4885 into CSO Section 1610.3 under the definition for "Crane" for clarity and consistency between the two somewhat parallel standards.
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.	Trolley (Travel bogie). A truck or carriage supporting the load mounted on an overhead beam, bridge, cableway or track.	CA GISO 4885 uses the term "trolley" however, we propose to modify the CA definition to also include "travel bogie."
Trim means angle of inclination about the	Trim. Angle of inclination about the transverse	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
transverse axis of a barge, pontoons, vessel or other means of floatation.	axis of a barge, pontoons, vessel or other means of floatation.	
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.	Two-Blocking. A condition in which the lower load block or hook assembly comes into contact with the upper load block or boom point sheave assembly. This binds the system and continued application of power can cause failure of the hoist rope or other component.	CA definition amended for additional clarity and consistency with federal definition.
Unavailable procedures means procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	Unavailable procedures. Procedures that are no longer available from the manufacturer, or have never been available, from the manufacturer.	
Upperstructure: See Upperworks.	Upperstructure: See “Upperworks.”	
Upperworks means the revolving frame of equipment on which the operating machinery (and many cases the engine) are mounted along with the operator’s cab. The counterweight is typically supported on the rear of the upperstructure and the boom or other front end attachment is mounted on the front.	Upperworks. 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.	
Up to means ‘‘up to and including.’’	Up to means ‘‘up to and including.’’	
Wire rope means a flexible rope constructed by laying steel wires into various patterns of multi-wired strands around a core system to produce a helically wound rope.	Wire rope. 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.	
§ 1926.1402 Ground conditions.	§1610.5. Ground Conditions.	
(a) Definitions. (1) ‘‘Ground conditions’’ means the ability of the ground to support the equipment (including slope, compaction, and firmness).	(a) Definitions. (1) Ground conditions. The ability of the ground to support the equipment (including slope, compaction, and firmness).	
(2) ‘‘Supporting materials’’ means blocking,	(2) Supporting materials. Blocking, mats,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
mats, cribbing, marsh buggies (in marshes/ wetlands), or similar supporting materials or devices.	cribbing, marsh buggies (in marshes/ wetlands), or similar supporting materials or devices.	
(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.	(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.	
(c) The controlling entity must: (1) Ensure that ground preparations necessary to meet the requirements in paragraph (b) of this section are provided.	(c) The controlling entity shall: (1) Ensure that ground preparations necessary to meet the requirements in subsection (b) are provided.	
(2) Inform the user of the equipment and the operator of the location of hazards beneath the equipment set-up area (such as voids, tanks, utilities) if those hazards are identified in documents (such as site drawings, as built drawings, and soil analyses) that are in the possession of the controlling entity (whether at the site or off-site) or the hazards are otherwise known to that controlling entity.	(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.	
(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.	(d) If there is no controlling entity for the project, the requirement in subsection (c)(1) shall be met by the employer that has authority at the site to make or arrange for ground preparations needed to meet subsection (b).	
(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in paragraph (b) of this	(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in subsection (b), that person's	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	employer shall have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/ devices (if necessary), the requirements in subsection (b) can be met.	
(f) This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213 and that comply with applicable Federal Railroad Administration requirements.	(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.	
§ 1926.1403 Assembly/Disassembly—selection of manufacturer or employer procedures.	§1611.1. Assembly/Disassembly—Selection of Manufacturer or Employer Procedures.	
When assembling or disassembling equipment (or attachments), the employer must comply with all applicable manufacturer prohibitions and must comply with either: (a) Manufacturer procedures applicable to assembly and disassembly, or (b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in § 1926.1406. Note: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. (See § 1926.1404(r).)	When assembling or disassembling equipment (or attachments), the employer must comply with all applicable manufacturer prohibitions and must comply with either: (a) Manufacturer procedures applicable to assembly and disassembly, or (b) Employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used meet the requirements in §1611.4. Note: The employer must follow manufacturer procedures when an employer uses synthetic slings during assembly or disassembly rigging. [See Section 1611.2(r).]	
§ 1926.1404 Assembly/Disassembly—general	§1611.2. Assembly/Disassembly—General	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
requirements (applies to all assembly and disassembly operations).	Requirements (applies to all assembly and disassembly operations).	
(a) Supervision—competent-qualified person. (1) Assembly/disassembly must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (‘‘A/D director’’). (2) Where the assembly/disassembly is being performed by only one person, that person must meet the criteria for both a competent person and a qualified person. For purposes of this standard, that person is considered the A/D director.	(a) Supervision—competent-qualified person. (1) Assembly/disassembly shall be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (“A/D director”). (2) Where the assembly/disassembly is being performed by only one person, that person 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.	
(b) Knowledge of procedures. The A/D director must understand the applicable assembly/ disassembly procedures.	(b) Knowledge of procedures. The A/D director shall understand the applicable assembly/ disassembly procedures.	
(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).	(c) Review of procedures. The A/D director shall 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. (1) Before commencing assembly/disassembly operations, the A/D director must ensure that the crew members understand all of the following: (i) Their tasks. (ii) The hazards associated with their tasks. (iii) The hazardous positions/locations that they need to avoid.	(d) Crew instructions. (1) Before commencing assembly/disassembly operations, the A/D director shall ensure that the crew members understand all of the following: (A) Their tasks. (B) The hazards associated with their tasks. (C) The hazardous positions/locations that they need to avoid.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.	(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 subsections (d)(1)(A) through (d)(1)(C) of this section shall be met.	
(e) Protecting assembly/disassembly crew members out of operator view. (1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by paragraph (e)(1) of this section, the operator must not move any part of the equipment (or load) until the operator is informed in accordance with a prearranged system of communication that the crew member is in a safe position.	(e) Protecting assembly/disassembly crew members out of operator view. (1) Before a crew member goes to a location that is out of view of the operator and is either in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member must inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by subsection (e)(1), 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.	
(f) Working under the boom, jib or other components. (1) When pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of paragraph (f)(2) of this section are met.	(f) Working under the boom, jib or other components. (1) When pins (or similar devices) are being removed, employees shall not be under the boom, jib, or other components.	
(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		California does not permit the exception.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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/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.	(g) Capacity limits. During all phases of assembly/disassembly, rated capacity limits for loads imposed on the equipment, equipment components (including rigging), lifting lugs and equipment accessories, shall not be exceeded for the equipment being assembled/ disassembled.	
(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation must address the hazards associated with the operation, which include: (1) Site and ground bearing conditions. Site and ground conditions must be adequate for safe assembly/disassembly operations and to support the equipment during assembly/disassembly (see § 1926.1402 for ground condition requirements). (2) Blocking material. The size, amount, condition and method of stacking the blocking must be sufficient to sustain the loads and maintain stability. (3) Proper location of blocking. When used to support lattice booms or components, blocking must be appropriately placed to: (i) Protect the structural integrity of the equipment, and (ii) Prevent dangerous movement and collapse.	(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation shall address the hazards associated with the operation, which include but are not limited to: (1) Site and ground bearing conditions. Site and ground conditions shall be adequate for safe assembly/disassembly operations and to support the equipment during assembly/ disassembly (see Section 1610.5 for ground condition requirements). (2) Blocking material. The size, amount, condition and method of stacking the blocking shall be sufficient to sustain the loads and maintain stability. (3) Proper location of blocking. When used to support lattice booms or components, blocking shall be appropriately placed to: (A) Protect the structural integrity of the equipment, and (B) Prevent dangerous movement and collapse.	New subsection (h)(1) will replace text of §4992. Booms, which reads: "Booms which are being assembled or disassembled on the ground shall be securely blocked or secured to prevent dropping of the boom and boom sections." Federal verbiage for (h) clarified to indicate that the hazards are not limited to those listed

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(4) Verifying assist crane loads. When using an assist crane, the loads that will be imposed on the assist crane at each phase of assembly/ disassembly must be verified in accordance with § 1926.1417(o)(3) before assembly/disassembly begins. (5) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) must be suitable for preventing structural damage and facilitating safe handling of these components. (6) Center of gravity. (i) The center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. (ii) Where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used. (See Non-mandatory Appendix B of this subpart for an example.) (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. (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).	(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 shall be verified in accordance with Section 1616.1(n)(3) before assembly/ disassembly begins. (5) Boom and jib pick points. The point(s) of attachment of rigging to a boom (or boom sections or jib or jib sections) shall be suitable for preventing structural damage and facilitating safe handling of these components. (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. (B) 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 shall be used. (7) 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. (8) 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).	
(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting	(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
counterweights.	counterweights.	
(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.	(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 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/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.	
(11) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.	(11) Loss of backward stability. Backward stability before swinging the upperworks, travel, and when attaching or removing equipment components.	
(12) Wind speed and weather. The effect of wind speed and weather on the equipment.	(12) Wind speed and weather. The effect of wind speed and weather on the equipment.	
(i) [Reserved.] (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.	(i) [Reserved.] (j) Cantilevered boom sections. Manufacturer limitations on the maximum amount of boom supported only by cantilevering shall not be exceeded. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved must determine in writing this limitation, which shall not be exceeded.	
(k) Weight of components. The weight of each of the components must be readily available. (l) [Reserved.]	(k) Weight of components. The weight of each of the components shall be readily available. (*l*) [Reserved.]	
(m) Components and configuration. (1) The selection of components, and configuration of the equipment, that affect the	(m) Components and configuration. (1) The selection of components, and configuration of the equipment, that affect the	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
capacity or safe operation of the equipment must be in accordance with: (i) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (ii) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications). (2) Post-assembly inspection. Upon completion of assembly, the equipment must be inspected to ensure compliance with paragraph (m)(1) of this section (see § 1926.1412(c) for post-assembly inspection requirements). (n) [Reserved.]	capacity or safe operation of the equipment shall be in accordance with: (A) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved shall approve, in writing, the selection and configuration of components; or (B) Approved modifications that meet the requirements of Section 1610.6 (Equipment Modifications). (2) Post-assembly inspection. Upon completion of assembly, the equipment shall be inspected to ensure compliance with subsection (m)(1) (see Section 1613.3 for post-assembly inspection requirements). (n) [Reserved.]	
(o) Shipping pins. Reusable shipping pins, straps, links, and similar equipment must be removed. Once they are removed they must either be stowed or otherwise stored so that they do not present a falling object hazard.	(o) Shipping pins. Reusable shipping pins, straps, links, and similar equipment shall be removed. Once they are removed they shall either be stowed or otherwise stored so that they do not present a falling object hazard.	
(p) Pile driving. Equipment used for pile driving must not have a jib attached during pile driving operations.	(p) Pile driving. Equipment used for pile driving shall 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 must be met (except as otherwise indicated): (1) The outriggers or stabilizers must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.	(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): (1) The outriggers or stabilizers shall be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.	(2) The outriggers shall be set to remove the equipment weight from the wheels, except for locomotive cranes (see subsection (q)(6) for use of outriggers on locomotive cranes). This provision does not apply to stabilizers.	
(3) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers. (4) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting. (5) Outrigger and stabilizer blocking must: (i) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section. (ii) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam. (6) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures must be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures must be met regarding truck wedges or screws.	(3) When outrigger floats are used, they shall be attached to the outriggers. When stabilizer floats are used, they shall be attached to the stabilizers. (4) Each outrigger or stabilizer shall be visible to the operator or to a signal person during extension and setting. (5) Outrigger and stabilizer blocking shall: (A) Meet the requirements in subsections (h)(2) and (h)(3). (B) Be placed only under the outrigger or stabilizer float/pad of the jack or, where the outrigger or stabilizer is designed without a jack, under the outer bearing surface of the extended outrigger or stabilizer beam. (6) For locomotive cranes, when using outriggers or stabilizers to handle loads, the manufacturer's procedures shall be followed. When lifting loads without using outriggers or stabilizers, the manufacturer's procedures shall be met regarding truck wedges or screws.	
(r) Rigging. In addition to following the requirements in 29 CFR 1926.251 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer must ensure that: (1) The rigging work is done by a qualified	(r) Rigging. In addition to following the requirements in General Industry Safety Orders, Article 101 and other requirements in this and other standards applicable to rigging, when rigging is used for assembly/disassembly, the employer shall ensure that: (1) The rigging work is done by a qualified	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
rigger. (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). (3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations must be followed.	rigger. (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 General Industry Safety Orders, Article 101, Section 5042. (3) When synthetic slings are used, the synthetic sling manufacturer's instructions, limitations, specifications and recommendations shall be followed.	
§ 1926.1405 Disassembly—additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures).	§1611.3. 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. (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 (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 (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).	*Dismantling (including dismantling for changing the length of) booms and jibs.* (a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension. (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 (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).	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.	(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (the portion being removed ahead of the pendant attachment points) are to be removed (partly or completely) until the cantilevered section to be removed is fully supported.	
§ 1926.1406 Assembly/Disassembly—employer procedures—general requirements.	§1611.4. Assembly/Disassembly – Employer Procedures – General Requirements.	
(a) When using employer procedures instead of manufacturer procedures for assembly/ disassembly, the employer must ensure that the procedures: (1) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment. (2) Provide adequate support and stability of all parts of the equipment. (3) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized. (b) Qualified person. Employer procedures must be developed by a qualified person.	(a) When using employer procedures instead of manufacturer procedures for assembly/ disassembly, the employer shall ensure that the procedures: (1) Prevent unintended dangerous movement, and prevent collapse, of any part of the equipment. (2) Provide adequate support and stability of all parts of the equipment. (3) Position employees involved in the assembly/disassembly operation so that their exposure to unintended movement or collapse of part or all of the equipment is minimized. (b) Qualified person. Employer procedures shall be developed by a qualified person.	
§ 1926.1407 Power line safety (up to 350 kV)—assembly and disassembly.	§1611.5. Power Line Safety (up to 350 kV)—Assembly and Disassembly.	
(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	(a) 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
assembly/disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (1) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (2) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (3) Option (3)—Table A clearance. (i) Determine the line's voltage and the minimum clearance distance permitted under Table A (see § 1926.1408). (ii) Determine if any part of the equipment, load line, or load (including rigging and lifting accessories), could get closer than the minimum clearance distance to the power line permitted under Table A (see § 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum clearance distance.	the assembly/disassembly process. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (1) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (2) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in subsection (b). (3) Option (3)—Table A clearance. (A) Determine the line's voltage and the minimum clearance distance permitted under Table A (see Section 1612.1). (B) 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 Section 1612.1). If so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum clearance distance.	
(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:	(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements shall be met:	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.	(1) Conduct a planning meeting with the A/D Director, operator, assembly/disassembly crew and the other workers who will be in the assembly/disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/ electrocution.	
(2) If tag lines are used, they must be nonconductive.	(2) If tag lines are used, they shall be nonconductive.	
(3) At least one of the following additional measures must be in place. The measure selected from this list must be effective in preventing encroachment.	(3) At least one of the following additional measures shall be in place. The measure selected from this list must be effective in preventing encroachment.	
The additional measures are:	The additional measures are:	
(i) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter must:	(A) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter shall:	
(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 lineof-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).	1. Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter).	
(B) Be positioned to effectively gauge the clearance distance.	2. Be positioned to effectively gauge the clearance distance.	
(C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.	3. 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	4. Give timely information to the operator so that the required clearance distance can be	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
maintained.	maintained.	
(ii) A proximity alarm set to give the operator sufficient warning to prevent encroachment.		Proximity alarms are not accepted in California as a reliable means of preventing encroachment/electrocution.
(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.	(B) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment.	
(iv) A device that automatically limits range of movement, set to prevent encroachment.	(C) A device that automatically limits range of movement, set to prevent encroachment.	
(v) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	(D) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	
(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line, or load (including rigging and lifting accessories), whether partially or fully assembled, is allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line. (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. (e) Voltage information. Where Option (3) of this section is used, the utility owner/operator	(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. (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 Section 1612.1) 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. (e) Voltage information. Where Option (3) of this section is used, the utility owner/operator	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
of the power lines must provide the requested voltage information within two working days of the employer's request. (f) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (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.	of the power lines shall provide the requested voltage information within two working days of the employer's request. (f) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (g) Posting of electrocution warnings. There shall 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.	
§ 1926.1408 Power line safety (up to 350 kV)—equipment operations.	§1612.1. Power Line Safety (up to 350 kV) – Equipment Operations.	
(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer must: (1) Identify the work zone by either: (i) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or (ii) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.	(a) Hazard assessments and precautions inside the work zone. Before beginning equipment operations, the employer shall: (1) Identify the work zone by either: (A) Demarcating boundaries (such as with flags, or a device such as a range limit device or range control warning device) and prohibiting the operator from operating the equipment past those boundaries, or (B) Defining the work zone as the area 360 degrees around the equipment, up to the equipment's maximum working radius.	
(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone,	(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,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
could get closer than 20 feet to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (i) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (ii) Option (2)—20 foot clearance. Ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer than 20 feet to the power line by implementing the measures specified in paragraph (b) of this section. (iii) Option (3)—Table A clearance. (A) Determine the line's voltage and the minimum approach distance permitted under Table A (see § 1926.1408). (B) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), while operating up to the equipment's maximum working radius in the work zone, could get closer than the minimum approach distance of the power line permitted under Table A (see § 1926.1408). If so, then the employer must follow the requirements in paragraph (b) of this section to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	could get closer than 20 feet to a power line. If so, the employer shall meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (A) Option (1)—Deenergize and ground. Confirm from the utility owner/operator that the power line has been deenergized and visibly grounded at the worksite. (B) Option (2)—20 foot clearance. Ensure that no part of the 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 subsection (b). (C) Option (3)—Table A clearance. 1. Determine the line's voltage and the minimum approach distance permitted under Table A (see Section 1612.1). 2. 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 so, then the employer shall follow the requirements in subsection (b) to ensure that no part of the equipment, load line, or load (including rigging and lifting accessories), gets closer to the line than the minimum approach distance.	
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this section,	(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this section,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
all of the following requirements must be met: (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/ electrocution. (2) If tag lines are used, they must be non-conductive. (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (see § 1926.1408) (if using Option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter must be used as described in § 1926.1408(b)(4)(ii) in addition to implementing one of the measures described in §§ 1926.1408(b)(4)(i), (iii), (iv) and (v). (4) Implement at least one of the following measures:	all of the following requirements shall be met: (1) Conduct a planning meeting with the operator and the other workers who will be in the area of the equipment or load to review the location of the power line(s), and the steps that will be implemented to prevent encroachment/ electrocution. (2) If tag lines are used, they shall be non-conductive. (3) Erect and maintain an elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings, at 20 feet from the power line (if using Option (2) of this section) or at the minimum approach distance under Table A (if using Option (3) of this section). If the operator is unable to see the elevated warning line, a dedicated spotter shall be used as described in subsection (b)(4)(A) in addition to implementing one of the measures described in subsections (b)(4)(B) and (C). (4) Implement at least one of the following measures:	
(i) A proximity alarm set to give the operator sufficient warning to prevent encroachment.		Proximity alarms are not accepted in California as a reliable means of preventing encroachment/electrocution.
(ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the	(A) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter shall: 1. 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment.	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). 2. Be positioned to effectively gauge the clearance distance. 3. Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. 4. Give timely information to the operator so that the required clearance distance can be maintained. (B) 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. (C) A device that automatically limits range of movement, set to prevent encroachment.	
(v) An insulating link/device, as defined in § 1926.1401, installed at a point between the end of the load line (or below) and the load.		Insulating links are not accepted in California as a reliable means of preventing electrocution.
(5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.	(5) The requirements of subsection (b)(4) do not apply to work covered by the High-Voltage Electrical Safety Orders.	
(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(c) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines shall provide the requested voltage information within two working days of the employer's request.	
(d) Operations below power lines. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is	(d) Operations below power lines. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph (d)(2) of this section applies. (2) Exceptions. Paragraph (d)(1) of this section is inapplicable where the employer demonstrates that one of the following applies: (i) The work is covered by subpart V of this part. (ii) For equipment with 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 section minimum clearance distance below the plane of the power line. (iii) For equipment with articulating or extensible booms: The uppermost part of the equipment, with the boom in the fully extended position, at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line. (iv) The employer demonstrates that compliance with paragraph (d)(1) of this section is infeasible and meets the requirements of § 1926.1410.	allowed below a power line unless the employer has confirmed that the utility owner/operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in subsection (d)(2) applies. (2) EXCEPTIONS. Subsection (d)(1) is inapplicable where the employer demonstrates that one of the following applies: (A) The work is covered by the High-Voltage Electrical Safety Orders. (B) 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 section minimum clearance distance below the plane of the power line. (C) 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. (D) The employer demonstrates that compliance with subsection (d)(1) is infeasible and meets the requirements of Section 1612.3.	
(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	(e) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
continues to be deenergized and visibly grounded at the worksite. (f) When working near transmitter/ communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter must be deenergized or the following precautions must be taken: (1) The equipment must be provided with an electrical ground. (2) If tag lines are used, they must be non-conductive.	continues to be deenergized and visibly grounded at the worksite. (f) When working near transmitter/ communication towers where the equipment is close enough for an electrical charge to be induced in the equipment or materials being handled, the transmitter shall be deenergized or the following precautions shall be taken: (1) The equipment shall be provided with an electrical ground. (2) If tag lines are used, they shall be non-conductive.	
(g) Training. (1) The employer must train each operator and crew member assigned to work with the equipment on all of the following: (i) The procedures to be followed in the event of electrical contact with a power line. Such training must include: (A) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. (B) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. (C) The safest means of evacuating from equipment that may be energized. (D) The danger of the potentially energized zone around the equipment (step potential). (E) The need for crew in the area to avoid approaching or touching the equipment and the load. (F) Safe clearance distance from power lines.	(g) Training. (1) The employer shall train each operator and crew member assigned to work with the equipment on all of the following: (A) The procedures to be followed in the event of electrical contact with a power line. Such training shall include: 1. Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. 2. 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. 3. The safest means of evacuating from equipment that may be energized. 4. The danger of the potentially energized zone around the equipment (step potential). 5. The need for crew in the area to avoid approaching or touching the equipment and the load. 6. Safe clearance distance from power lines.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(ii) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (iii) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.	(B) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (C) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power transmission and distribution confirms that a line is insulated.	
(iv) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used. (v) The procedures to be followed to properly ground equipment and the limitations of grounding.	(D) The limitations of a range control device, if used. (E) The procedures to be followed to properly ground equipment and the limitations of grounding.	California does not consider proximity alarms and insulating links to be a reliable means of preventing encroachment/electrocution.
(2) Employees working as dedicated spotters must be trained to enable them to effectively perform their task, including training on the applicable requirements of this section. (3) Training under this section must be administered in accordance with § 1926.1430(g). (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.	(2) Employees working as dedicated spotters shall be trained to enable them to effectively perform their task, including training on the applicable requirements of this section. (3) Training under this section shall be administered in accordance with Section 1618.4(g). (h) Devices originally designed by the manufacturer for use as: A safety device (see Section 1615.1), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, shall meet the manufacturer's procedures for use and conditions of use.	
TABLE A—MINIMUM CLEARANCE DISTANCES Voltage (nominal, kV, alternating current) Minimum clearance distance (feet) up to 50 10	TABLE A—MINIMUM CLEARANCE DISTANCES Voltage (nominal, kV, alternating current) — Minimum clearance distance (feet) up to 50 — 10 over 50 to 175 — 15	CA Section 1612.1, Table A, has been coordinated with CA High-Voltage Electrical Safety Orders, Section 2946, Table 2. CA Table A Voltages and Clearances are based on

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
over 50 to 200 ..... 15 over 200 to 350 ..... 20 over 350 to 500 ..... 25 over 500 to 750 ..... 35 over 750 to 1,000 ..... 45 over 1,000 ..... (as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution). **Note:** The value that follows ''to'' is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.	over 175 to 350 — 20 over 350 to 550 — 27 over 550 to 1,000 — 45 over 1,000 — (as established by the utility owner/ operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution). Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.	Federal Table A or CA Section 2946, Table 2, whichever is more protective.
§ 1926.1409 Power line safety (over 350 kV).	§1612.2. Power Line Safety (Over 350 kV).	
The requirements of § 1926.1407 and § 1926.1408 apply to power lines over 350 kV except: (a) For power lines at or below 1000 kV, wherever the distance ''20 feet'' is specified, the distance ''50 feet'' must be substituted; and (b) For power lines over 1000 kV, the minimum clearance distance must be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.	The requirements of §1611.5 and §1612.1 apply to power lines over 350 kV except: (a) For power lines at or below 1000 kV, wherever the distance "20 feet" is specified, the distance "50 feet" shall be substituted; and (b) For power lines over 1000 kV, the minimum clearance distance shall be established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.	
§ 1926.1410 Power line safety (all voltages)—equipment operations closer than the Table A zone.	§1612.3. Power Line Safety (All Voltages) – Equipment Operations Closer than the Table A Zone.	
Equipment operations in which any part of the equipment, load line, or load (including rigging and lifting accessories) is closer than the minimum approach distance under Table A of §	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	With the exception of the text shown, CA does not propose to adopt the balance of this section. CA standards are more protective. See HVESO Section 2946, particularly 2946(b)(3).

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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 of § 1926.1408.	Section 1612.1 to an energized power line is prohibited.	*[Editorial note: See also 2940.2, 2940.7, 2944(d)(2)]*
(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. (1) The power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution determines the minimum clearance distance that must be maintained to prevent electrical contact in light of the on-site conditions. The factors that must be considered in making this determination include, but are not limited to: Conditions affecting atmospheric conductivity; time necessary to bring the equipment, load line, and load (including rigging and lifting accessories) to a complete stop; wind conditions; degree of sway in the power line; lighting conditions, and other conditions affecting the ability to prevent electrical contact.		
(2) Paragraph (c)(1) of this section does not apply to work covered by subpart V of this part; instead, for such work, the minimum clearance distances specified in § 1926.950 Table V–1 apply.		

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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.		
(d) A planning meeting with the employer and utility owner/operator (or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution) is held to determine the procedures that will be followed to prevent electrical contact and electrocution. At a minimum these procedures must include: (1) If the power line is equipped with a device that automatically reenergizes the circuit in the event of a power line automatic reclosing feature of the circuit interrupting device must be made inoperative if the design of the device permits.		
(2) A dedicated spotter who is in continuous contact with the operator. The dedicated spotter must: (i) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (ii) Be positioned to effectively gauge the clearance distance. (iii) Where necessary, use equipment that enables the dedicated spotter to communicate		

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FEDERAL: §1926	STATE:	RATIONALE
directly with the operator. (iv) Give timely information to the operator so that the required clearance distance can be maintained.		
(3) An elevated warning line, or barricade (not attached to the crane), in view of the operator (either directly or through video equipment), equipped with flags or similar high-visibility markings, to prevent electrical contact. However, this provision does not apply to work covered by subpart V of this part.		
(4) Insulating link/device. (i) An insulating link/device installed at a point between the end of the load line (or below) and the load.		
(ii) For work covered by subpart V of this part, the requirement in paragraph (d)(4)(i) of this section applies only when working inside the § 1926.950 Table V–1 clearance distances.		
(iii) For work covered by subpart V of this part involving operations where use of an insulating link/device is infeasible, the requirements of § 1910.269(p)(4)(iii)(B) or (C) may be substituted for the requirement in (d)(4)(i) of this section.		
(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		

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FEDERAL: §1926	STATE:	RATIONALE
are adequate insulation for the purposes of this paragraph.		
(v) Until November 8, 2013, the following procedure may be substituted for the requirement in (d)(4)(i) of this section: (A) The employer must use a link/device manufactured on or before 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 (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.		
(5) Nonconductive rigging if the rigging may be within the Table A of § 1926.1408 distance during the operation.		
(6) If the equipment is equipped with a device that automatically limits range of movement, it must be used and set to prevent any part of the equipment, load line, or load (including rigging and lifting accessories) from breaching the minimum approach distance established under		

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FEDERAL: §1926	STATE:	RATIONALE
paragraph (c) of this section.		
(7) If a tag line is used, it must be of the nonconductive type. (8) Barricades forming a perimeter at least 10 feet away from the equipment to prevent unauthorized personnel from entering the work area. In areas where obstacles prevent the barricade from being at least 10 feet away, the barricade must be as far from the equipment as feasible.		
(9) Workers other than the operator must be prohibited from touching the load line above the insulating link/device and crane. Operators remotely operating the equipment from the ground must use either wireless controls that isolate the operator from the equipment or insulating mats that insulate the operator from the ground. (10) Only personnel essential to the operation are permitted to be in the area of the crane and load. (11) The equipment must be properly grounded. (12) Insulating line hose or cover-up must be installed by the utility owner/operator except where such devices are unavailable for the line voltages involved.		
(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/ 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		

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FEDERAL: §1926	STATE:	RATIONALE
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 paragraph (d) of this section are implemented.		
(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.]		
(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 (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.]		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(m) The employer must train each operator and crew member assigned to work with the equipment in accordance with § 1926.1408(g).		
§ 1926.1411 Power line safety—while traveling under or near power lines with no load.	§1612.4. Power Line Safety – While Traveling Under or Near Power Lines with No Load.	
(a) This section establishes procedures and criteria that must be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by §§ 1926.1408, 1926.1409 or 1926.1410, whichever is appropriate, and § 1926.1417(u).	(a) This section establishes procedures and criteria that shall be met for equipment traveling under or near a power line on a construction site with no load. Equipment traveling on a construction site with a load is governed by Sections 1612.1, 1612.2 or 1612.3, whichever is appropriate, and Section 1616.1(t). (1) The provisions of Electrical Safety Orders, Group 2, Article 37, shall also apply to any work in proximity to overhead power lines where more protective.	Subsection (a)(1) added to assure that provisions of California High-Voltage Electrical Safety Orders, which apply to all work in proximity to overhead lines, are not negated or superseded by this section.
(b) The employer must ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer must	(b) The employer shall ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this section. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer shall	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

<table>
<tr><th>FEDERAL: §1926</th><th>STATE:</th><th>RATIONALE</th></tr>
<tr><td>ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter must:
(i) Be positioned to effectively gauge the clearance distance.
(ii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
(iii) Give timely information to the operator so that the required clearance distance can be maintained.
(5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, in addition to the measures specified in paragraphs (b)(1) through (4) of this section, the employer must ensure that:
(i) The power lines are illuminated or another means of identifying the location of the lines is used.
(ii) A safe path of travel is identified and used.</td><td>ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter shall:
(A) Be positioned to effectively gauge the clearance distance.
(B) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator.
(C) Give timely information to the operator so that the required clearance distance can be maintained.
(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 subsections (b)(1) through (4), the employer shall ensure that:
(A) The power lines are illuminated or another means of identifying the location of the lines is used.
(B) A safe path of travel is identified and used.</td><td></td></tr>
<tr><td>TABLE T—MINIMUM CLEARANCE DISTANCES WHILE TRAVELING WITH NO LOAD
Voltage
(nominal, kV, alternating current)
While traveling—minimum clearance distance (feet)
up to 0.75 4
over .75 to 50 6
over 50 to 345 10
over 345 to 750 16
Over 750 to 1,000 20
Over 1,000 .....
(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td><td>TABLE T—MINIMUM CLEARANCE DISTANCES WHILE TRAVELING WITH NO LOAD
<table><tr><th>Voltage (nominal, kV, alternating current)</th><th>While traveling—minimum clearance distance (feet)</th></tr><tr><td>up to 0.60</td><td>4</td></tr><tr><td>over .60 to 50</td><td>6</td></tr><tr><td>over 50 to 345</td><td>10</td></tr><tr><td>over 345 to 750</td><td>16</td></tr><tr><td>Over 750 to 1,000</td><td>20</td></tr><tr><td>Over 1,000</td><td>(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).</td></tr></table></td><td>Clearances below 750 Volts coordinated with CA Section 2946, Table 1, which is more protective for 600 to 750 volts.</td></tr>
</table>

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FEDERAL: §1926	STATE:	RATIONALE
§ 1926.1412 Inspections.	§1613.1. Inspections – Modified Equipment.	
(a) Modified equipment. (1) Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load sustaining structural components, load hook, or in-use operating mechanism) or capacity must be inspected by a qualified person after such modifications/ additions have been completed, prior to initial use. The inspection must meet all of the following requirements: (i) The inspection must assure that the modifications or additions have been done in accordance with the approval obtained pursuant to § 1926.1434 (Equipment modifications). (ii) The inspection must include functional testing of the equipment. (2) Equipment must not be used until an inspection under this paragraph demonstrates that the requirements of paragraph (a)(1)(i) of this section have been met.	(a) 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 shall be inspected by a certificating agency after such modifications/ additions have been completed, prior to initial use. The inspection shall meet all of the following requirements: (1) The inspection shall assure that the modifications or additions have been done in accordance with the approval obtained pursuant to Section 1610.6 (Equipment Modifications). (2) The inspection shall include functional testing of the equipment. EXCEPTION: These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity. (b) Equipment shall not be used until an inspection under this section demonstrates that the requirements of subsection (a)(1) have been met.	CA requires these inspections to be performed by a certified agent on cranes exceeding 3 tons rated capacity. [Reference GISO Section 5021].
	(c) In the case of major modifications or repairs to important structural components, cranes shall be proof load tested in accordance with GISO Section 5022 before being returned to service.	Required by GISO 5022(a)(3)
(b) Repaired/adjusted equipment.	§1613.2. Inspections – Repaired/Adjusted Equipment.	Notes added to provide safety equivalent to GISO crane standards.

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FEDERAL: §1926	STATE:	RATIONALE
(1) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or inuse operating mechanism), must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use. The inspection must meet all of the following requirements: (i) The qualified person must determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available). (ii) Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person must: (A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed, the employer must ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (B) Determine if the repair/adjustment meets the criteria developed in accordance with paragraph (b)(1)(ii)(A) of this section. (iii) The inspection must include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment. (4) Equipment must not be used until an inspection under this paragraph demonstrates	(a) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), shall be inspected by a certificating agency after such a repair or adjustment has been completed, prior to initial use. The inspection shall meet all of the following requirements: (1) The certificating agency shall determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available). (2) Where manufacturer equipment criteria are unavailable or inapplicable, the certificating agency shall: (A) Determine if a registered professional engineer (RPE) is needed to develop criteria for the repair/adjustment. If an RPE is not needed, the employer shall ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer shall ensure that they are developed by an RPE. (B) Determine if the repair/adjustment meets the criteria developed in accordance with subsection (a)(2)(A). (3) The inspection shall 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 section demonstrates that	

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FEDERAL: §1926	STATE:	RATIONALE
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).	the repair/adjustment meets the requirements of subsection (a)(1) [or, where applicable, subsection (a)(2)]. NOTES: 1. These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity. 2. Proof load tests are required in the case of major modifications or repairs to important structural components, and shall comply with General Industry Safety Orders, Section 5022.	
(c) Post-assembly. (1) Upon completion of assembly, the equipment must be inspected by a qualified person to assure that it is configured in accordance with manufacturer equipment criteria. (2) Where manufacturer equipment criteria are unavailable, a qualified person must: (i) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an RPE is not needed, the employer must ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer must ensure that they are developed by an RPE. (ii) Determine if the equipment meets the criteria developed in accordance with paragraph (c)(2)(i) of this section. (3) Equipment must not be used until an inspection under this paragraph demonstrates that the equipment is configured in accordance with the applicable criteria.	§1613.3. Inspections – Post-Assembly. (a) Upon completion of assembly, the equipment shall be inspected by a qualified person or certificating agency to assure that it is configured in accordance with manufacturer equipment criteria. (b) Where manufacturer equipment criteria are unavailable, a qualified person or certificating agency shall: (1) Determine if a registered professional engineer (RPE) familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an RPE is not needed, the employer shall ensure that the criteria are developed by the qualified person. If an RPE is needed, the employer shall ensure that they are developed by an RPE. (2) Determine if the equipment meets the criteria developed in accordance with subsection (b)(1). (c) Equipment shall not be used until an inspection under this subsection demonstrates and documents that the equipment is configured in accordance with the applicable criteria.	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	EXCEPTION: These inspections may be performed by a qualified person for cranes not exceeding 3 tons rated capacity. NOTE: Applicable criteria are prescribed in General Industry Safety Orders, Articles 99 (Testing) and 100 (Inspection and Maintenance).	
(d) Each shift.	§1613.4. Inspections – Each Shift.	
(1) A competent person must begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift.	(a) Each shift. A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift.	The first part of subsection (a) is copied from GISO section 5031 which is more protective – requires the inspection to be completed prior to first operation on any work shift. The second part is from the federal standard.
The inspection must consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed.	The inspection shall consist of observation for apparent deficiencies. Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed.	
Determinations made in conducting the inspection must be reassessed in light of observations made during operation.	Any unsafe conditions disclosed by the inspection requirements of this Article shall be corrected promptly. Defective components of equipment which create an imminent safety hazard shall be replaced, repaired or adjusted prior to use.	GISO sec. 5031(a) more protective – repairs must be made prior to use.
At a minimum the inspection must include all of the following:	At a minimum the inspection shall include all of the following:	
(i) Control mechanisms for maladjustments interfering with proper operation.	(1) Control mechanisms for maladjustments interfering with proper operation.	
(ii) Control and drive mechanisms for apparent excessive wear of components and	(2) Control and drive mechanisms for apparent excessive wear of components and	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
contamination by lubricants, water or other foreign matter.	contamination by lubricants, water or other foreign matter.	
(iii) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation. (iv) Hydraulic system for proper fluid level.	(3) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation. (4) Hydraulic system for proper fluid level.	
(v) Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat.	(5) 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.	(6) Wire rope reeving for compliance with the manufacturer's specifications.	
(vii) Wire rope, in accordance with § 1926.1413(a).	(7) Wire rope, in accordance with Section 1613.10(a).	
(viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (ix) Tires (when in use) for proper inflation and condition. (x) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. This paragraph does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (xi) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup.	(8) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (9) Tires (when in use) for proper inflation and condition. (10) 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 section 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. (11) 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.	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(xii) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (xiii) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This paragraph does not apply to the inspection of rails, rail stops, rail clamps and supporting surfaces when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (xiv) Safety devices and operational aids for proper operation.	(12) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (13) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This section 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. (14) Safety devices and operational aids for proper operation.	
(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 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.	(b) If any deficiency in subsections (a)(1) through (13) (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination shall be made by the qualified 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.	
(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.	(c) If any deficiency in subsection (a)(14) (safety devices/operational aids) is identified, the action specified in Section 1615.1 and Section 1615.2 shall be taken prior to using the equipment.	
(e) Monthly.	§1613.5. Inspections – Periodic.	
(1) Each month the equipment is in service it must be inspected in accordance with paragraph	(a) Periodic inspections shall be conducted at least four times a year. The annual certification,	These provisions, copied from GISO 5031(c), except (c)(3) which is a general industry

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(d) of this section (each shift). (2) Equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraphs (d)(2) and (3) of this section is required.	as required by General Industry Safety Orders, Sections 5021(a) and Construction Safety Orders Section 1613.6, can serve as one of the required periodic inspections. The periodic inspections shall be evenly spaced or as close to evenly spaced as scheduling permits through the year. Cranes shall not be operated more than 750 hours, between periodic inspections. The inspection shall include the following in addition to the items in section 1613.4 (Inspections – Daily): (1) Excessive wear of all functional operating mechanisms. (2) Ropes, brakes, friction clutches, chain drives, and other parts subject to wear which may be readily inspected.	provision, are more protective than federal monthly inspections which merely require documentation of daily inspections.
3) Documentation. (i) The following information must be documented and maintained by the employer that conducts the inspection: (A) The items checked and the results of the inspection. (B) The name and signature of the person who conducted the inspection and the date. (ii) This document must be retained for a minimum of three months.	(3) An inspection record shall be maintained which includes the date of the inspection, the signature of the person who performed the inspection, and the serial number or other identifier of the crane inspected, the items checked and the results of the inspection. The most recent inspection record shall be maintained on file.	Subsection (a)(3) is supplemented with federal subsection (a)(3)(i)(A) for equivalent safety.
(f) Annual/comprehensive.	§1613.6. Inspections – Annual/Comprehensive.	
(1) At least every 12 months the equipment must be inspected by a qualified person in accordance with paragraph (d) of this section (each shift) except that the corrective action set forth in paragraphs (f)(4), (f)(5), and (f)(6) of this section must apply in place of the corrective action required by paragraphs (d)(2)	(a) At least every 12 months the equipment shall be inspected by a certificating agency in accordance with Section 1613.4 (Daily/each shift) except that the corrective actions set forth in sections 1613.4, 1613.5 and 1613.6 shall apply in place of the corrective action required by Sections 1613.2 and 1613.3.	Subsection 1613.6(a)(1) copied from 5031(d) which is more protective.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
and (d)(3) of this section.		
(2) In addition, at least every 12 months, the equipment must be inspected by a qualified person.	(b) In addition, at least every 12 months, equipment shall be inspected by a certificating agency.	Cranes exceeding 3 tons capacity must be certified annually per California Title 8, Section 5021 and per California Labor Code Section 7375.
Disassembly is required, as necessary, to complete the inspection. The equipment must be inspected for all of the following:	Disassembly is required, as necessary, to complete the inspection; however, whenever it is practical and advisable to avoid disassembly of equipment, removal of pins, etc., examination of structure or parts by electronic, ultrasonic, or other nondestructive methods shall be carried out. The equipment shall be inspected for all of the following:	Provision for NDT added (relocated from 5031(d)(4).
(i) Equipment structure (including the boom and, if equipped, the jib): (A) Structural members: Deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose, failed or significantly corroded. (C) Welds for cracks.	(1) Equipment structure (including the boom and, if equipped, the jib): (A) Structural members: Deformed, cracked, or significantly corroded. (B) Bolts, rivets and other fasteners: loose, failed or significantly corroded. (C) Welds for cracks. (D) Junction areas of removable boom sections, particularly for proper seating, cracks, deformities, or other defects in securing bolts and in the vicinity of such bolts.	*[Ed note: Provisions of GISO 5022(d)(6), (7), (8) & (12) have been added.]*
(ii) Sheaves and drums for cracks or significant wear. (iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.	(2) All functional operating mechanisms for improper function, maladjustment, and excessive component wear, with particular attention to the following: (A) Sheaves and drums for cracks or significant wear. (B) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear. NOTE: This shall include operation with partial	*[Ed note: (2) and Note copied from GISO 5022(d)(1)]*

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed.	
(iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear.	(3) Excessive wear on and free operation of brake and clutch system parts, linings, pawls, and ratchets.	*[Ed note: Copied from GISO 5022(d)(9)]*
(v) Safety devices and operational aids for proper operation (including significant inaccuracies).	(4) Safety devices and operational aids for proper operation (including significant inaccuracies).	
(vi) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.	(5) Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.	
(vii) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.	(6) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.	
(viii) Travel steering, brakes, and locking devices, for proper operation.	(7) Travel steering, brakes, and locking devices, for proper operation.	
(ix) Tires for damage or excessive wear.	(8) Tires for damage or excessive wear.	
(x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.	(9) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.	
(xi) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: Unusual noises or vibration, low operating speed, excessive	(10) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: Unusual noises or vibration, low operating speed, excessive	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks.	heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks.	
(xii) Hydraulic and pneumatic valves, as follows: (A) Spools: Sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed).	(11) Hydraulic and pneumatic valves, as follows: (A) Spools: Sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it shall be followed).	
(xiii) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks. (C) Cylinder rods for scores, nicks, or dents. (D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: Loose or deformed.	(12) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the piston. (B) Rod seals and welded joints for leaks. (C) Cylinder rods for scores, nicks, or dents. (D) Case (barrel) for significant dents. (E) Rod eyes and connecting joints: Loose or deformed.	
(xiv) Outrigger or stabilizer pads/floats for excessive wear or cracks.	(13) Outrigger or stabilizer pads/floats for excessive wear or cracks.	
(xv) Slider pads for excessive wear or cracks.	(14) Slider pads for excessive wear or cracks	
(xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.	(15) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.	
(xvii) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: Missing or unreadable.	(16) Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required under this standard: Missing or unreadable.	
(xviii) Originally equipped operator seat (or equivalent): Missing.	(17) Originally equipped operator seat (or equivalent): Missing or unserviceable.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(xix) Operator seat: Unserviceable.		
(xx) Originally equipped steps, ladders, handrails, guards: Missing. (xxi) Steps, ladders, handrails, guards: In unusable/unsafe condition.	(18) Originally equipped steps, ladders, handrails, guards: Missing, or in unusable/ unsafe condition.	
	(19) Load, boom angle, or other indicators shall be checked for any inaccuracy.	*[Ed note: Copied from 5022(d)(10)]*
	(20) Loose gear components (i.e. hooks, etc.), including wire rope and wire rope terminals and connections, with particular attention to sections of wire rope exposed to abnormal wear and sections not normally exposed for examination. (A) Crane hooks with cracks or with deformation of throat opening more than 15 percent in excess of normal opening or more than 10 degree twist from plane of unbent hook shall be removed from service.	*[Ed note: Copied from 5022(d)(4) and supplemented with 5031(d)(1)]*
	(21) Rope reeving for compliance with certified agent's recommendations.	*[Ed note: Copied from 5022(d)(5)]*
	(22) It shall be ascertained that no counterweights in excess of the certified agent's specifications are fitted.	*[Ed note: Copied from 5022(d)(13)]*
	(23) Such other examinations deemed necessary under the circumstances.	*[Ed note: Copied from 5022(d)(14)]*
(3) This inspection must include functional testing to determine that the equipment as configured in the inspection is functioning properly.	(c) This inspection shall include functional testing to determine that the equipment as configured in the inspection is functioning properly.	
(4) If any deficiency is identified, an immediate determination 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	(d) If any deficiency is identified, an immediate determination shall be made by the certificating agency as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the periodic	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
inspections.	inspections.	
(5) If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in § 1926.1416(d) or § 1926.1435(e). See § 1926.1417.	(e) If the certificating agency 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 Section 1615.2(d) or Section 1619.1(e). See Section 1616.1.	
(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.	(f) If the certificating agency 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 periodic inspections.	
(7) Documentation of annual/comprehensive inspection. The following information must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: (i) The items checked and the results of the inspection. (ii) The name and signature of the person who conducted the inspection and the date.	(g) Documentation of annual/comprehensive inspection. (1) The following information shall be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: (A) The items checked and the results of the inspection. (B) The name and signature of the person who conducted the inspection and the date.	
	EXCEPTION: Annual/Comprehensive inspections of Section 1613.6 may be performed by a qualified person for cranes not exceeding 3 tons rated capacity.	
	(2) Records required for crane certification shall be maintained in accordance with the provisions of Title 8 CCR Section 344.80.	
	§1613.7. Inspections – Severe Service.	
(g) Severe service. Where the severity of use/	Where the severity of use/conditions is such	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer must stop using the equipment and a qualified person must: (1) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely. (2) In light of the use/conditions determine whether any items/conditions listed in paragraph (f) of this section need to be inspected; if so, the qualified person must inspect those items/conditions. (3) If a deficiency is found, the employer must follow the requirements in paragraphs (f)(4) through (6) of this section.	that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer shall stop using the equipment and a qualified person shall: (a) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely. (b) In light of the use/conditions determine whether any items/conditions listed in Section 1613.6 need to be inspected; if so, the qualified person shall inspect those items/conditions. (c) If a deficiency is found, the employer shall follow the requirements in subsections 1613.6(d) through (f).	
(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. (i) [Reserved.]	§1613.8. Inspections – Equipment Not in Regular Use. Equipment that has been idle for 3 months or more shall be inspected by a certificating agency or qualified person in accordance with the requirements of Section 1613.5 (Inspections – Periodic), before initial use.	
(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,	§1613.9. Inspections – General. (a) 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,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	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 Article shall be followed.	
(k) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	(b) All documents produced under this Article shall be available, during the applicable document retention period, to all persons who conduct inspections under this Article.	
§ 1926.1413 Wire rope—inspection.	§1613.10. Inspections - Wire Rope.	
(a) Shift inspection. (1) A competent person must begin a visual inspection prior to each shift the equipment is used, which must be completed before or during that shift.	(a) Shift inspection. (1) A qualified person shall begin a visual inspection prior to each shift the equipment is used, which shall be completed before or during that shift.	GISO 5031(a) requires such inspections to be made by a qualified person.
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.	The inspection shall 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 subsection (a)(2). Untwisting (opening) of wire rope or booming down is not required as part of this inspection.	
(2) Apparent deficiencies. (i) Category I. Apparent deficiencies in this category include the following: (A) Significant distortion of the wire rope structure such as kinking, crushing, unstranding, birdcaging, signs of core failure or steel core protrusion between the outer strands. (B) Significant corrosion. (C) Electric arc damage (from a source other than power lines) or heat damage.	(2) Apparent deficiencies. (A) Category I. Apparent deficiencies in this category include the following: 1. 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. 2. Significant corrosion. 3. Electric arc damage (from a source other than power lines) or heat damage.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(D) Improperly applied end connections. (E) Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	4. Improperly applied end connections. 5. Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	
(ii) Category II. Apparent deficiencies in this category are: (A) Visible broken wires, as follows: (1) In running wire ropes: Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the rope. (2) In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters. (3) In pendants or standing wire ropes: More than two broken wires in one rope lay located in rope beyond end connections and/or more than one broken wire in a rope lay located at an end connection. (B) A diameter reduction of more than 5% from nominal diameter.	(B) Category II. Apparent deficiencies in this category are: 1. Visible broken wires, as follows: a. 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. b. In rotation resistant ropes: Two randomly distributed broken wires in six rope diameters or four randomly distributed broken wires in 30 rope diameters. c. 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. 2. A diameter reduction of more than 5% from nominal diameter.	
(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. (B) Prior electrical contact with a power line. (C) A broken strand.	(C) Category III. Apparent deficiencies in this category include the following: 1. In rotation resistant wire rope, core protrusion or other distortion indicating core failure. 2. Prior electrical contact with a power line. 3. A broken strand.	
(3) Critical review items. The competent person must give particular attention to all of the following:	(3) Critical review items. The qualified person shall give particular attention to all of the following:	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(i) Rotation resistant wire rope in use. (ii) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends. (iii) Wire rope at flange points, crossover points and repetitive pickup points on drums. (iv) Wire rope at or near terminal ends. (v) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.	A. Rotation resistant wire rope in use. B. 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. D. Wire rope at or near terminal ends. E. Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.	
(4) Removal from service. (i) If a deficiency in Category I (see paragraph (a)(2)(i) of this section) is identified, an immediate determination must be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	(4) Removal from service. A. If a deficiency in Category I [see subsection (a)(2)(A)] is identified, an immediate determination shall be made by the qualified 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: 1. The wire rope is replaced, or 2. 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 section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	
(ii) If a deficiency in Category II (see paragraph (a)(2)(ii) of this section) is identified, operations involving use of the wire rope in question must be prohibited until: (A) The employer complies with the wire rope manufacturer's established criterion for	B. If a deficiency in Category II [see subsection (a)(2)(B)] is identified, operations involving use of the wire rope in question shall be prohibited until: 1. The employer complies with the wire rope manufacturer's established criterion for	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope (see § 1926.1417), (B) The wire rope is replaced (see § 1926.1417), or (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.	removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope, 2. The wire rope is replaced, or 3. 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 section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	
(iii) If a deficiency in Category III is identified, operations involving use of the wire rope in question must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency (other than power line contact) is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. Repair of wire rope that contacted an energized power line is also prohibited. 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: 1. The wire rope is replaced, or 2. 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 section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position.	
(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	D. 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
that wire rope must be tagged-out, in accordance with § 1926.1417(f)(1), until the wire rope is repaired or replaced.	wire rope shall be tagged-out, in accordance with Section 1616.1(g)(1), until the wire rope is repaired or replaced.	
(b) Monthly inspection.	(b) Monthly inspection.	
(1) Each month an inspection must be conducted in accordance with paragraph (a) (shift inspection) of this section. (2) The inspection must include any deficiencies that the qualified person who conducts the annual inspection determines under paragraph (c)(3)(ii) of this section must be monitored. (3) Wire ropes on equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraph (a)(4) of this section is required. (4) The inspection must be documented according to § 1926.1412(e)(3) (monthly inspection documentation).	(1) Each month an inspection shall be conducted in accordance with subsection (a) (Shift Inspection). (2) The inspection shall include any deficiencies that the qualified person who conducts the annual inspection determines under subsection (c)(3)(B) shall be monitored. (3) Wire ropes on equipment shall not be used until an inspection under this section demonstrates that no corrective action under subsection (a)(4) is required. (4) The inspection shall be documented according to Section 1613.5(a)(3) (monthly inspection documentation).	
(c) Annual/comprehensive.	(c) Annual/comprehensive.	
(1) At least every 12 months, wire ropes in use on equipment must be inspected by a qualified person in accordance with paragraph (a) of this section (shift inspection).	(1) At least every 12 months, wire ropes in use on equipment shall be inspected by a qualified person in accordance with subsection (a) (Shift Inspection).	
(2) In addition, at least every 12 months, the wire ropes in use on equipment must be inspected by a qualified person, as follows: (i) The inspection must be for deficiencies of the types listed in paragraph (a)(2) of this section. (ii) The inspection must be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following:	(2) In addition, at least every 12 months, the wire ropes in use on equipment shall be inspected by a qualified person, as follows: (A) The inspection shall be for deficiencies of the types listed in subsection (a)(2). (B) 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:	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(A) Critical review items listed in paragraph (a)(3) of this section. (B) Those sections that are normally hidden during shift and monthly inspections. (C) Wire rope subject to reverse bends. (D) Wire rope passing over sheaves. (iii) Exception: In the event an inspection under paragraph (c)(2) of this section is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections must be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly.	1. Critical review items listed in subsection (a)(3). 2. Those sections that are normally hidden during shift and monthly inspections. 3. Wire rope subject to reverse bends. 4. Wire rope passing over sheaves. EXCEPTION: In the event an inspection under subsection (c)(2) is not feasible due to existing set-up and configuration of the equipment (such as where an assist crane is needed) or due to site conditions (such as a dense urban setting), such inspections shall be conducted as soon as it becomes feasible, but no longer than an additional 6 months for running ropes and, for standing ropes, at the time of disassembly.	
(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 must be prohibited until: (A) The wire rope is replaced (see § 1926.1417), or (B) If the deficiency is localized, the problem is corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this paragraph, the employer must ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position. (ii) If the qualified person determines that,	(3) If a deficiency is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. (A) If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until: 1. The wire rope is replaced, or 2. 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 section, the employer shall ensure that the drum will still have two wraps of wire when the load and/or boom is in its lowest position. (B) If the qualified person determines that,	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	though not presently a safety hazard, the deficiency needs to be monitored, the employer shall ensure that the deficiency is checked in the periodic inspections.	
(4) The inspection must be documented according to § 1926.1412(f)(7) (annual/comprehensive inspection documentation).	(4) The inspection shall be documented according to Section 1613.6(g) Inspections – Annual/ Comprehensive.	
(d) Rope lubricants that are of the type that hinder inspection must not be used. (e) All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	(d) Rope lubricants that are of the type that hinder inspection shall not be used. (e) All documents produced under this section shall be available, during the applicable document retention period, to all persons who conduct inspections under this section.	
§ 1926.1414 Wire rope—selection and installation criteria.	§1614. Wire Rope – Selection and Installation Criteria.	
(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.	(a) Original equipment wire rope and replacement wire rope shall be selected and installed in accordance with the requirements of this section. Selection of replacement wire rope shall be in accordance with the recommendations of the wire rope manufacturer, the equipment manufacturer, or a qualified person.	
(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) must comply with either Option (1) or Option (2) of this section, as follows: (1) Option (1). Wire rope must comply with section 5–1.7.1 of ASME B30.5–2004 (incorporated by reference, see § 1926.6) except that section's paragraph (c) must not apply.	(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) shall comply with either Option (1) or Option (2) of this section, as follows: (1) Option (1). Wire rope shall comply with section 5–1.7.1 of ASME B30.5–2004 except that subsection 5-1.7.1(c) shall not apply.	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.	(2) 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 Section 1613.10 (Inspections – Wire Rope) will be an effective means of preventing sudden rope failure.	
(c) Wire rope must be compatible with the safe functioning of the equipment.	(c) Wire rope shall be compatible with the safe functioning of the equipment.	
(d) Boom hoist reeving. (1) Fiber core ropes must not be used for boom hoist reeving, except for derricks. (2) Rotation resistant ropes must be used for boom hoist reeving only where the requirements of paragraph (e)(4)(ii) of this section are met.	(d) Boom hoist reeving. (1) Fiber core ropes shall not be used for boom hoist reeving, except for derricks. (2) Rotation resistant ropes shall be used for boom hoist reeving only where the requirements of subsection (e)(4)(B) are met.	
(e) Rotation resistant ropes. (1) Definitions. (i) Type I rotation resistant wire rope (''Type I''). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(e) Rotation resistant ropes. (1) Definitions. (A) Type I rotation resistant wire rope ("Type I"). Type I rotation resistant rope is stranded rope constructed to have little or no tendency to rotate or, if guided, transmits little or no torque. It has at least 15 outer strands and comprises an assembly of at least three layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(ii) Type II rotation resistant wire rope (''Type II''). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or	(B) Type II rotation resistant wire rope ("Type II"). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(iii) Type III rotation resistant wire rope (''Type III''). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(C) Type III rotation resistant wire rope ("Type III"). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(2) Requirements. (i) Types II and III with an operating design factor of less than 5 must not be used for duty cycle or repetitive lifts. (ii) Rotation resistant ropes (including Types I, II and III) must have an operating design factor of no less than 3.5. (iii) Type I must have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing. (iv) Types II and III must have an operating design factor of no less than 5, except where the requirements of paragraph (e)(3) of this section are met.	(2) Requirements. (A) Types II and III with an operating design factor of less than 5 shall not be used for duty cycle or repetitive lifts. (B) Rotation resistant ropes (including Types I, II and III) shall have an operating design factor of no less than 3.5. (C) Type I shall have an operating design factor of no less than 5, except where the wire rope manufacturer and the equipment manufacturer approves the design factor, in writing. (D) Types II and III shall have an operating design factor of no less than 5, except where the requirements of subsection (e)(3) are met.	
(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements must be met for each lifting operation: (i) A qualified person must inspect the rope in	(3) When Types II and III with an operating design factor of less than 5 are used (for non-duty cycle, non-repetitive lifts), the following requirements shall be met for each lifting operation: (A) A qualified person shall inspect the rope in	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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 must be conducted in such a manner and at such speeds as to minimize dynamic effects. (iii) Each lift made under § 1926.1414(e)(3) must be recorded in the monthly and annual inspection documents. Such prior uses must be considered by the qualified person in determining whether to use the rope again.	accordance with Section 1613.10(a). 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 one broken wire in any one rope lay shall be considered a hazard. (B) Operations shall be conducted in such a manner and at such speeds as to minimize dynamic effects. (C) Each lift made under subsection(e)(3) shall be recorded in the monthly and annual inspection documents. Such prior uses shall be considered by the qualified person in determining whether to use the rope again.	
(4) *Additional requirements for rotation resistant ropes for boom hoist reeving.* (i) Rotation resistant ropes must not be used for boom hoist reeving, except where the requirements of paragraph (e)(4)(ii) of this section are met.	(4) Additional requirements for rotation resistant ropes for boom hoist reeving. (A) Rotation resistant ropes shall not be used for boom hoist reeving, except where the requirements of subsection (e)(4)(B) are met.	
(ii) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements must be met:	(B) Rotation resistant ropes may be used as boom hoist reeving when load hoists are used as boom hoists for attachments such as luffing attachments or boom and mast attachment systems. Under these conditions, all of the following requirements shall be met:	
(A) The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (B) The requirements in § 1926.1426(a) (irrespective of the date of manufacture of the equipment), and § 1926.1426(b).	1. The drum shall provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. 2. The requirements in Section 1616.5(a) (irrespective of the date of manufacture of the equipment), and Section 1616.5(b).	
(C) The requirements in ASME B30.5–2004 sections 5–1.3.2(a), (a)(2) through (a)(4), (b)	3. The requirements in ASME B30.5–2004 sections 5–1.3.2(a), (a)(2) through (a)(4), (b)	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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)).	and (d) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5–1.3.2(d)).	
(D) All sheaves used in the boom hoist reeving system 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 must be not less than five. (F) The operating design factor for these ropes must be the total minimum breaking force of all parts of rope in the system divided by the load imposed on the rope system when supporting the static weights of the structure and the load within the equipment's rated capacity. (G) When provided, a power controlled lowering system must be capable of handling rated capacities and speeds as specified by the manufacturer.	4. 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. 5. The operating design factor for the boom hoist reeving system shall be not less than five. 6. 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. 7. When provided, a power controlled lowering system shall be capable of handling rated capacities and speeds as specified by the manufacturer.	
(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 deadending rope in a wedge socket is permitted. (g) Socketing must be done in the manner specified by the manufacturer of the wire rope or fitting. (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	(f) 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 deadending rope in a wedge socket is permitted. (g) Socketing shall be done in the manner specified by the manufacturer of the wire rope or fitting. (h) 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
instructions.	instructions.	
§ 1926.1415 Safety devices.	§1615.1. Safety Devices.	
(a) Safety devices. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified:	(a) Safety devices. The following safety devices are required on all equipment covered by Article 15, unless otherwise specified:	
(1) Crane level indicator. (i) The equipment must have a crane level indicator that is either built into the equipment or is available on the equipment. (ii) If a built-in crane level indicator is not working properly, it must be tagged-out or removed. If a removable crane level indicator is not working properly, it must be removed. (iii) This requirement does not apply to portal cranes, derricks, floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	(1) Crane level indicator. (A) The equipment shall have a crane level indicator that is either built into the equipment or is available on the equipment. (B) 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. (C) 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.	*[4924e]*
(2) Boom stops, except for derricks and hydraulic booms. (3) Jib stops (if a jib is attached), except for derricks.	(2) Boom stops, except for derricks and hydraulic booms. (3) Jib stops (if a jib is attached), except for derricks.	*[4922]*
(4) Equipment with foot pedal brakes must have locks.	(4) Equipment with foot pedal brakes shall have locks.	*[4899, 4900]*
(5) Hydraulic outrigger jacks and hydraulic stabilizer jacks must have an integral holding device/check valve.	(5) Hydraulic outrigger jacks and hydraulic stabilizer jacks shall have an integral holding device/check valve.	
(6) Equipment on rails must have rail clamps and rail stops, except for portal cranes.	(6) Equipment on rails shall have rail clamps and rail stops, except for portal cranes.	
(7) Horn (i) The equipment must have a horn that is either built into the equipment or is on the equipment and immediately available to the operator.	(7) Horn (A) The equipment shall have a horn that is either built into the equipment or is on the equipment and immediately available to the operator.	*[4889, 4936]*

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(ii) If a built-in horn is not working properly, it must be tagged-out or removed. If a removable horn is not working properly, it must be removed.	(B) 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.	
(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.	(b) Proper operation required. Operations shall 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 shall safely stop operations. If any of the devices listed in this section 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. See Section 1616.1 (Operation). Alternative measures are not permitted to be used.	
§ 1926.1416 Operational aids.	§1615.2. Operational Aids.	
(a) The devices listed in this section (‘‘listed operational aids’’) are required on all equipment covered by this subpart, unless otherwise specified. (1) The requirements in paragraphs (e)(1), (e)(2), and (e)(3) of this section do not apply to articulating cranes. (2) The requirements in paragraphs (d)(3), (e)(1), and (e)(4) of this section apply only to those digger derricks manufactured after November 8, 2011.	(a) The devices listed in this section (‘‘listed operational aids’’) are required on all equipment covered by Article 15, unless otherwise specified. (1) The requirements in subsections (e)(1), (e)(2), and (e)(3) do not apply to articulating cranes. (2) The requirements in subsections (d)(3), (e)(1), and (e)(4) apply only to those digger derricks manufactured after [Effective date plus one year].	
(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	(b) Operations shall 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	periods permitted for repairing defective operational aids are specified in subsections (d) and (e). More protective alternative measures specified by the crane/derrick manufacturer, if any, shall be followed.	
(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.	(c) If a listed operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly.	Substitute (non-specified) alternatives may require a variance.
(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.	(d) Category I operational aids. Operational aids listed in this section 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 Section 1616.1(j) for additional requirements.	
(1) Boom hoist limiting device. (i) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. *Temporary alternative measures (use at least one).* One or more of the following methods must be used:	(1) Boom hoist limiting device. (A) 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 shall be used:	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(A) Use a boom angle indicator. (B) Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark. (C) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.	1. Use a boom angle indicator. 2. 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. 3. Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.	
(ii) If the equipment was manufactured on or before December 16, 1969, and is not equipped with a boom hoist limiting device, at least one of the measures in paragraphs (d)(1)(i)(A) through (C) of this section must be used.	(B) 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 subsections (d)(1)(A)1-3 shall be used.	
(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.	(2) Luffing jib limiting device. Equipment with a luffing jib shall have a luffing jib limiting device. Temporary alternative measures are the same as in subsection (d)(1)(A), except to limit the movement of the luffing jib rather than the boom hoist.	
(3) Anti two-blocking device. (i) Telescopic boom cranes manufactured after February 28, 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	(3) Anti two-blocking device. (A) Telescopic boom cranes manufactured after February 28, 1992, shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The	*[See 4924(d)(1)]*

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
device(s) must prevent such damage at all points where two-blocking could occur.	device(s) shall prevent such damage at all points where two-blocking could occur.	
Temporary alternative measures: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.		California does not permit this temporary alternative measure. *(4924d)*
(ii) Lattice boom cranes. (A) Lattice boom cranes manufactured after Feb 28, 1992, must be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device must prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. (B) Lattice boom cranes and derricks manufactured after 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.	(B) Lattice boom cranes. 1. Lattice boom cranes manufactured after Feb 28, 1992, shall be equipped with a device that either automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component), or warns the operator in time for the operator to prevent two-blocking. The device shall prevent such damage/failure or provide adequate warning for all points where two-blocking could occur. 2. Lattice boom cranes and derricks manufactured after [Effective date plus one year] shall be equipped with a device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage/failure at all points where two-blocking could occur.	*See 4924d2*
(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,	EXCEPTION. The requirements in subsection` (d)(3)(B) do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, and drop ball work.	The CA exception is more limited than the federal exception. (See GISO 4924d2 Exception)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
marine operations that do not involve hoisting personnel, and pile driving work.		
(D) *Temporary alternative measures.* Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter.		California does not permit this temporary alternative measure.
(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.	(C) Articulating cranes manufactured after December 31, 1999, that are equipped with a load hoisting device (winch) 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 such damage at all points where two-blocking could occur.	Ed note: Amended with verbiage from 4924(d)(3). Feds effective date is earlier than state.
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.		California does not permit this temporary alternative measure.
(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	(e) Category II operational aids and alternative measures. Operational aids listed in this subsection that are not working properly shall be repaired no later than 30 calendar days after	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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. See §1926.1417(j) for additional requirements.	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. See Section 1616.1(j) for additional requirements.	
(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.	(1) Boom angle or radius indicator.Cranes shall be provided with a boom angle or radius indicator which clearly shows the boom angle in degrees to the operator at all times. EXCEPTION: When a boom angle or radius indicator is inoperative or malfunctioning, a qualified person shall determine the radius or boom angle by measurement until the indicator is restored to operation. (A) Boom angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.	Copied from GISO 4924(c) except amended to apply to all cranes; not just mobile.
(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.	(2) Jib angle indicator if the equipment has a luffing jib. Temporary alternative measures: Radii or jib angle shall be determined by a qualified person ascertaining the main boom angle and then measuring the radii or jib angle with a measuring device. (A) Jib angle or radius indicators shall be repaired in accordance with the manufacturer's recommendations.	Amended with GISO 4924(b)(2)
(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length.	(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
Temporary alternative measures. One or more of the following methods must be used: (i) Mark the boom with measured marks to calculate boom length, (ii) Calculate boom length from boom angle and radius measurements, (iii) Measure the boom with a measuring device.	Temporary alternative measures. One or more of the following methods shall be used: (A) Mark the boom with measured marks to calculate boom length, (B) Calculate boom length from boom angle and radius measurements, (C) Measure the boom with a measuring device.	
(4) Load weighing and similar devices. (i) Equipment (other than derricks and articulating cranes) manufactured after March 29, 2003 with a rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment (or rated capacity) indicator, or load moment (or rated capacity) limiter.	(4) Load weighing and similar devices. (A) 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: 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.	*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 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.	(B) Articulating cranes manufactured after [Effective date plus one year] shall 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	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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	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.	
(5) The following devices are required on equipment manufactured after November 8, 2011: (i) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. *Temporary alternative measures:* The operator must verify that the position of the outriggers or stabilizers is correct (in accordance with manufacturer procedures) before beginning operations requiring outrigger or stabilizer deployment.	(5) The following devices are required on equipment manufactured after [Effective date plus one year]: (A) Outrigger/stabilizer position (horizontal beam extension) sensor/monitor if the equipment has outriggers or stabilizers. Temporary alternative 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.	
(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.	(B) 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.	
§ 1926.1417 Operation.	§1616.1 Operation.	
(a) The employer must comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	(a) The employer shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments.	Adopt federal verbiage.
(b) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer must develop and ensure compliance with all procedures	(b) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer shall develop and ensure compliance with all procedures	Federal verbiage except that "qualified person" and "registered professional engineer" are replaced with "certified agent," consistent with GISO 4965 and definitions in section 4885.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls must be developed by a qualified person. (3) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.	necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls shall be developed by a certified agent. (3) Procedures related to the capacity of the equipment shall be developed and signed by a certified agent.	
(c) Accessibility of procedures. (1) The procedures applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, must be readily available in the cab at all times for use by the operator.	(c) Each crane shall be provided with a descriptive booklet, written in English, containing a comprehensive summary of design characteristics, erection procedures, operation techniques, repair recommendations, and safety precautions. This booklet shall be available on in the cab at all times for use by the operator. (1) A durable, clearly legible load rating chart shall be provided with each crane and securely affixed in the cab or operator's station easily visible to the operator while at the controls. The chart shall include load ratings and restrictions as specified by the certified agent for specific lengths of components, counterweights, swing, and radii. Where load ratings for cranes are governed by structural competence, the limitation on loading shall be such that no structural member is overstressed, and load rating charts shall be subject to this limitation.	Copied from section 4965(b) and (c) which covers this subject.
(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.	(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 shall immediately cease operations or follow safe shut-down procedures until the rated capacities (in electronic or other form) are available.	Adopt federal verbiage.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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).	(d) The operator shall 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).	Adopt federal verbiage.
(e) Leaving the equipment unattended. (1) The operator must not leave the controls while the load is suspended, except where all of the following are met: (i) The operator remains adjacent to the equipment and is not engaged in any other duties. (ii) The load is to be held suspended for a period of time exceeding normal lifting operations. (iii) The competent person determines that it is safe to do so and implements measures necessary to restrain the boom hoist and telescoping, load, swing, and outrigger or stabilizer functions. (iv) Barricades or caution lines, and notices, are erected to prevent all employees from entering the fall zone. No employees, including those listed in §§ 1926.1425(b)(1) through (3), § 1926.1425(d) or § 1926.1425(e), are permitted in the fall zone.	(e) Before leaving the crane unattended, the operator shall be required to: (1) Land or properly secure any attached load, bucket, lifting magnet, or other device; (2) Disengage clutch; (3) Set travel, swing, boom brakes, and other locking devices unless otherwise specified by the certified agents; (4) Put controls in the "off" position; (5) Stop the engine or motor; (6) Secure crane against accidental travel. (f) Holding the Load. (1) When a load of any kind is to be suspended for any considerable time, the drum holding mechanism shall be used in addition to the brake which shall also be applied. (2) Cranes, hoists, or derricks shall not be left unattended while the load is suspended unless the load is suspended over water, a barricaded area, or is blocked up or otherwise supported from below during repairs or emergency.	Copied from GISO 5008(e) and 4999(i)
(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.		The federal exception is less protective than existing GISO 4999(i).

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(f) Tag-out. (1) Tagging out of service equipment/functions. Where the employer has taken the equipment out of service, a tag must be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag must be placed in a conspicuous position stating that the function is out of service and is not to be used.	(g) Tag-out. (1) Tagging out of service equipment/functions. Where the employer has taken the equipment out of service, a tag shall be placed in the cab stating that the equipment is out of service and is not to be used. Where the employer has taken a function(s) out of service, a tag shall be placed in a conspicuous position stating that the function is out of service and is not to be used.	
(2) Response to ‘‘do not operate’’/tagout signs. (i) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator must not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it, or until the operator has verified that: (A) No one is servicing, working on, or otherwise in a dangerous position on the machine. (B) The equipment has been repaired and is working properly.	(2) Response to “do not operate”/tagout signs. (A) If there is a warning (tag-out or maintenance/do not operate) sign on the equipment or starting control, the operator shall not activate the switch or start the equipment until the sign has been removed by a person authorized to remove it in accordance with the provisions of General Industry Safety Orders, Section 3314.	Modified federal verbiage. CA Lock-out Tag-out standards (Section 3314) are more protective than parts of this federal paragraph.
(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.	(B) If there is a warning (tag-out or maintenance/do not operate) sign on any other switch or control, the operator shall not activate that switch or control until the sign has been removed by a person authorized to remove it in accordance with the provisions of General Industry Safety Orders, Section 3314.	Modified federal verbiage. CA Lock-out Tag-out standards (Section 3314) are more protective than parts of this federal paragraph.
(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.	(h) 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(h) Storm warning. When a local storm warning has been issued, the competent person must determine whether it is necessary to implement manufacturer recommendations for securing the equipment. (i) [Reserved.]	(i) Storm warning. When a local storm warning has been issued, the competent person shall determine whether it is necessary to implement manufacturer recommendations for securing the equipment.	
(j) If equipment adjustments or repairs are necessary: (1) The operator must, in writing, promptly inform the person designated by the employer to receive such information and, where there are successive shifts, to the next operator; and (2) The employer must notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.	(j) If equipment adjustments or repairs are necessary: (1) 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; and (2) The employer shall notify all affected employees, at the beginning of each shift, of the necessary adjustments or repairs and all alternative measures.	
(k) Safety devices and operational aids must not be used as a substitute for the exercise of professional judgment by the operator. (l) [Reserved.]	(k) Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.	*[Ed note: this may be unenforceable.]*
(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.	(l) If a qualified 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.	
(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.	(m) The competent person shall adjust the equipment and/or operations to address the effect of wind, ice, and snow on equipment stability and rated capacity.	
(o) Compliance with rated capacity. (1) The equipment must not be operated in excess of its rated capacity. (2) The operator must not be required to	(n) Compliance with rated capacity. (1) The equipment shall not be operated in excess of its rated capacity. (2) The operator shall not be required to operate	*[Ed note: federal (o)(2) seems redundant.]*

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
operate the equipment in a manner that would violate paragraph (o)(1) of this section.	the equipment in a manner that would violate subsection (n)(1) of this section.	
(3) Load weight. The operator must verify that the load is within the rated capacity of the equipment by at least one of the following methods: (i) The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information must be provided to the operator prior to the lift; or (ii) The operator must begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter, if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation. If it does, the operator must not proceed with the lift until he/she verifies the weight of the load in accordance with paragraph (o)(3)(i) of this section.	(3) Load weight. A crane, derrick, or hoist shall not be loaded beyond the rated capacity or safe working load whichever is smaller, except for test purposes. In all operations where the weight of the load being handled is unknown and may approach the rated capacity, there shall be a qualified person (rigger) assigned to determine the magnitude of the load, unless the crane or derrick is equipped with a load weighing device. The operator shall not make any lift under these conditions until informed of such weight by the qualified person (rigger) assigned to that operation.	Copied from GISO 4999(b) which clarifies that load weight determination is the rigger's responsibility.
(p) The boom or other parts of the equipment must not contact any obstruction.	(o) The boom or other parts of the equipment shall not contact any obstruction.	
(q) The equipment must not be used to drag or pull loads sideways.	(p) Side Loading. Side loading of booms shall be limited to freely suspended loads, and booms shall not be used for dragging loads sideways unless the boom is specifically designed and constructed to withstand such side loading.	Copied from GISO 4999(g).
(r) On wheel-mounted equipment, no loads	(q) On wheel-mounted equipment, no loads	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
must be lifted over the front area, except as permitted by the manufacturer.	shall be lifted over the front area, except as permitted by the manufacturer.	
(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.	(r) The operator shall test the brakes each time a load that is 90% or more of the maximum line pull is handled by lifting the load a few inches and applying the brakes. In duty cycle and repetitive lifts where each lift is 90% or more of the maximum line pull, this requirement applies to the first lift but not to successive lifts.	
(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.	(s) The load or the boom shall not be lowered below the point where less than two full wraps of rope remain on grooved drums and three full wraps on ungrooved drums.	Copied from 4994(d) which is more protective.
(u) Traveling with a load. (1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (2) Where traveling with a load, the employer must ensure that: (i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (ii) The determinations of the competent person required in paragraph (u)(2)(i) of this section are implemented. (iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.	(t) Travel. (1) The travel of cranes or boom-type excavators shall be controlled so as to avoid collision with persons, material, and equipment. The cabs of units (of the revolving type) traveling under their own power shall be turned so as to provide the least obstruction to the operator's vision in the direction of travel, unless receiving signals from someone with an unobstructed view. (2) In transit, the following additional precautions for mobile cranes shall be exercised: (A) The boom shall be carried in line with the direction of motion and the superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab, or when the boom is supported on a dolly. (B) The empty hook, headache ball, or block shall be lashed or otherwise restrained so that it	(1) & (2) copied from GISO 4991(a) & (b). Federal verbiage added as subsections (3) and (4)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	cannot swing freely.	
(u) Traveling with a load. (1) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (2) Where traveling with a load, the employer must ensure that: (i) A competent person supervises the operation, determines if it is necessary to reduce rated capacity, and makes determinations regarding load position, boom location, ground support, travel route, overhead obstructions, and speed of movement necessary to ensure safety. (ii) The determinations of the competent person required in paragraph (u)(2)(i) of this section are implemented. (iii) For equipment with tires, tire pressure specified by the manufacturer is maintained.	(3) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (4) Where traveling with a load, the employer shall ensure that: (A) 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. (B) For equipment with tires, tire pressure specified by the manufacturer is maintained.	Federal (u)(2)(ii) is redundant.
(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.	(u) Swing. When rotating the crane, sudden stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be safely controlled.	Copied from GISO 4993 which is more protective.
(w) A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.	(v) A tag or restraint line shall be used if necessary to prevent rotation of the load that would be hazardous.	
(x) The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.	(w) The brakes shall be adjusted in accordance with manufacturer procedures to prevent unintended movement.	
(y) The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.	(x) The operator shall obey a stop (or emergency stop) signal, irrespective of who gives it.	
(z) Swinging locomotive cranes. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it,	(y) Swinging locomotive cranes. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.	until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.	
(aa) Counterweight/ballast. (1) The following applies to equipment other than tower cranes: (i) Equipment must not be operated without the counterweight or ballast in place as specified by the manufacturer. (ii) The maximum counterweight or ballast specified by the manufacturer for the equipment must not be exceeded. (2) Counterweight/ballast requirements for tower cranes are specified in § 1926.1435(b)(8).	(z) Counterweight/ballast. (1) The following applies to equipment other than tower cranes: (A) Equipment shall not be operated without the counterweight or ballast in place as specified by the manufacturer. (B) The maximum counterweight or ballast specified by the manufacturer for the equipment shall not be exceeded. (2) Counterweight/ballast requirements for tower cranes are specified in Section 1619.1(b)(8).	
§ 1926.1418 Authority to stop operation.	§1616.2. Authority to stop operation.	
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.	Whenever there is a concern as to safety, the operator shall have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.	
§ 1926.1419 Signals—general requirements.	§1617.1. Signals – General requirements.	
(a) A signal person must be provided in each of the following situations: (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (2) When the equipment is traveling, the view in the direction of travel is obstructed. (3) Due to site specific safety concerns, either the operator or the person handling the load determines that it is necessary.	(a) A signal person shall be provided in each of the following situations: (1) The point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator. (2) When the equipment is traveling, the view in the direction of travel is obstructed. (3) Due to site-specific safety concerns, either the operator or the person handling the load determines that it is necessary.	
	(b) Only qualified persons shall be permitted to	Copied from GISO 5001(b)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	give signals. Exception: A stop signal may be given by any person.	
(b) Types of signals. Signals to operators must be by hand, voice, audible, or new signals.	(c) Types of signals. Signals to operators shall be by hand, voice, or audible.	"New signals" not permitted by CCR T8 except with a variance.
(c) Hand signals. (1) When using hand signals, the Standard Method must be used (see Appendix A of this subpart).	(d) Hand Signals. (1) A uniform signal system shall be used on all operations and if hand signals are used, they shall be clearly understood by the operator. (Note: For recommended hand signals, see General Industry Safety Orders, Section 5001, Plate I.)	Copied from and referenced to GISO 5001(c) for consistency.
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.	EXCEPTION: Where an operation or use of an attachment is not covered in the recommended hand signals, Plate I, nonstandard hand signals may be used in accordance with subsection (d)(2).	
(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.	(2) Non-standard hand signals. When using non-standard hand signals, the signal person, operator, and lift director (where there is one) shall contact each other prior to the operation and agree on the non-standard hand signals that will be used.	
	(3) There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.	(3) is copied from GISO 5001(e) which is more protective.
(d) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or		New signals may be permitted subject to a variance.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.		
(e) Suitability. The signals used (hand, voice, audible, or new), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), must be appropriate for the site conditions.	(e) Suitability. The signals used (hand, voice, or audible), and means of transmitting the signals to the operator (such as direct line of sight, video, radio, etc.), shall be appropriate for the site conditions.	
(f) During operations requiring signals, the ability to transmit signals between the operator and signal person must be maintained. If that ability is interrupted at any time, the operator must safely stop operations requiring signals until it is reestablished and a proper signal is given and understood.	(f) During operations requiring signals, the ability to transmit signals between the operator and signal person shall be maintained. If that ability is interrupted at any time, the operator shall safely stop operations requiring signals until it is reestablished and a proper signal is given and understood. (1) Signal systems other than manual shall be protected against unauthorized use, breakage, weather or obstruction which will interfere with safe operation. In the event of any known malfunction, an alternate signal system shall be used or all motion shall be stopped.	(f)(1) copied from GISO 5001(d) which supplements the federal standard.
(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.	(g) If the operator becomes aware of a safety problem and needs to communicate with the signal person, the operator shall safely stop operations. Operations shall not resume until the operator and signal person agree that the problem has been resolved.	
(h) Only one person may give signals to a crane/derrick at a time, except in circumstances covered by paragraph (j) of this section. (i) [Reserved.]	(h) Only one person shall give signals to a crane/derrick at a time, except in circumstances covered by subsection (i).	
(j) Anyone who becomes aware of a safety problem must alert the operator or signal person	(i) Anyone who becomes aware of a safety problem must alert the operator or signal person	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
by giving the stop or emergency stop signal. (Note: § 1926.1417(y) requires the operator to obey a stop or emergency stop signal).	by giving the stop or emergency stop signal. (Note: Section 1616.1(x) requires the operator to obey a stop or emergency stop signal).	
(k) All directions given to the operator by the signal person must be given from the operator's direction perspective. (l) [Reserved.]	(j) All directions given to the operator by the signal person shall be given from the operator's direction perspective.	
(m) Communication with multiple cranes/ derricks. Where a signal person(s) is in communication with more than one crane/derrick, a system must be used for identifying the crane/derrick each signal is for, as follows: (1) for each signal, prior to giving the function/direction, the signal person must identify the crane/derrick the signal is for, or (2) must use an equally effective method of identifying which crane/derrick the signal is for.	(k) Communication with multiple cranes/ derricks. Where a signal person(s) is in communication with more than one crane/derrick, a system shall be used for identifying the crane/derrick each signal is for, as follows: (1) for each signal, prior to giving the function/direction, the signal person shall identify the crane/derrick the signal is for, or (2) shall use an equally effective method of identifying which crane/derrick the signal is for.	
§ 1926.1420 Signals—radio, telephone or other electronic transmission of signals.	§1617.2. Signals – Radio, Telephone or other Electronic Transmission Of Signals.	
(a) The device(s) used to transmit signals must be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.	(a) The device(s) used to transmit signals shall be tested on site before beginning operations to ensure that the signal transmission is effective, clear, and reliable.	
(b) Signal transmission must be through a dedicated channel, except: (1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with	(b) Signal transmission shall be through a dedicated channel, except: (1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
the movement of other equipment or trains on the same or adjacent tracks.	the movement of other equipment or trains on the same or adjacent tracks.	
(c) The operator's reception of signals must be by a hands-free system.	(c) The operator's reception of signals shall be by a hands-free system.	
§ 1926.1421 Signals—voice signals—additional requirements.	§1617.3. Signals – Voice Signals – Additional Requirements.	
(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), must contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.	(a) Prior to beginning operations, the operator, signal person and lift director (if there is one), shall contact each other and agree on the voice signals that will be used. Once the voice signals are agreed upon, these workers need not meet again to discuss voice signals unless another worker is added or substituted, there is confusion about the voice signals, or a voice signal is to be changed.	
(b) Each voice signal must contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.	(b) Each voice signal shall contain the following three elements, given in the following order: function (such as hoist, boom, etc.), direction; distance and/or speed; function, stop command.	
(c) The operator, signal person and lift director (if there is one), must be able to effectively communicate in the language used.	(c) The operator, signal person and lift director (if there is one), shall be able to effectively communicate in the language used.	
§ 1926.1422 Signals—hand signal chart.	§1617.1. Signals – General requirements.	
Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.	(d)(4) Hand signal charts shall be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.	
§ 1926.1423 Fall protection.	§1610.7. Fall Protection.	
(a) Application. (1) Paragraphs (b), (c)(3), (e) and (f) of this section apply to all equipment covered by this	(a) Application. (1) Subsections (b), (c)(3), (e) and (f) apply to all equipment covered by Construction Safety	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
subpart except tower cranes. (2) Paragraphs (c)(1), (c)(2), (d), (g), (j) and (k) of this section apply to all equipment covered by this subpart. (3) Paragraphs (c)(4) and (h) of this section apply only to tower cranes.	Orders (CSO) Article 15 except tower cranes. (2) Subsections (c)(1), (d), and (g) apply to all equipment covered by CSO Article 15. (3) Subsections (c)(3) and (h) apply only to tower cranes.	
(b) Boom walkways. (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. (2) Boom walkway criteria. (i) The walkways must be at least 12 inches wide. (ii) Guardrails, railings and other permanent fall protection attachments along walkways are: (A) Not required. (B) Prohibited on booms supported by pendant ropes or bars if the guardrails/ railings/ attachments could be snagged by the ropes or bars. (C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). (D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.	(b) Boom walkways. (1) Equipment manufactured after [Effective date plus 1 year] with lattice booms shall be equipped with walkways on the boom(s) if the vertical profile of the boom (from cord centerline to cord centerline) is 6 or more feet. (2) Boom walkway criteria. (A) The walkways shall be at least 12 inches wide. (B) Guardrails, railings and other permanent fall protection attachments along boom walkways are: 1. Not required. 2. Prohibited on booms supported by pendant ropes or bars if the guardrails/ railings/ attachments could be snagged by the ropes or bars. 3. Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). 4. Where not prohibited, guardrails or railings shall be in accordance with Article 16.	
(c) Steps, handholds, ladders, grabrails, guardrails and railings. (1) Section 1926.502(b) does not apply to equipment covered by this subpart.	(c) Steps, handholds, ladders, grabrails, guardrails and railings.	CA does not waive requirements for guardrails and railings [1926.502(b)] on cranes and derricks.
(2) The employer must maintain in good condition originally-equipped steps, handholds,	(1) The employer shall maintain in good condition originally-equipped steps, handholds,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
ladders and guardrails/railings/grabrails. (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/grabrails must meet the criteria of SAE J185 (May 2003) (incorporated by reference, see § 1926.6) or ISO 11660–2:1994(E) (incorporated by reference, see § 1926.6) except where infeasible. (ii) Walking/stepping surfaces, except for crawler treads, must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	ladders and guardrails/railings/grabrails. (2) Equipment manufactured after [Effective date plus 1 year] shall 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 shall meet the following criteria: (A) Steps, handholds, ladders and guardrails/ railings/grabrails shall meet the criteria of SAE J185 (May 2003) (incorporated by reference) or ISO 11660–2:1994(E) (incorporated by reference) except where infeasible. (B) Walking/stepping surfaces, except for crawler treads, shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	
(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/grabrails must meet the criteria of ISO 11660–1:2008(E) (incorporated by reference, see § 1926.6) and ISO 11660–3:2008(E) (incorporated by reference, see § 1926.6) or SAE J185 (May 2003) (incorporated by	(3) Tower cranes manufactured after [Effective date plus 1 year] shall 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 shall meet the following criteria: (A) Steps, handholds, ladders, and guardrails/ railings/grabrails shall meet the criteria of ISO 11660–1:2008(E) (incorporated by reference) and ISO 11660–3:2008(E) (incorporated by reference) or SAE J185 (May 2003) (incorporated by reference) except where	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
reference, see § 1926.6) except where infeasible.	infeasible.	
(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).	(B) Walking/stepping surfaces shall have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	
(d) Personal fall arrest and fall restraint systems. Personal fall arrest system components must be used in personal fall arrest and fall restraint systems and must conform to the criteria in § 1926.502(d) except that § 1926.502(d)(15) does not apply to components used in personal fall arrest and fall restraint systems. Either body belts or body harnesses must be used in personal fall arrest and fall restraint systems.	(d) 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 Section 1670 except that Section 1670(b)(10) does not apply to components used in personal fall arrest and fall restraint systems.	Section 1670 spells out where body belts and harnesses may be used. Body belts are not permitted for use in fall arrest systems.
(e) For non-assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level as follows: (1) When moving point-to-point: (i) On non-lattice booms (whether horizontal or not horizontal). (ii) On lattice booms that are not horizontal. (iii) On horizontal lattice booms where the fall distance is 15 feet or more. (2) While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	(e) For non-assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 7-1/2 feet above a lower level as follows: (1) When moving point-to-point: (A) On non-lattice booms (whether horizontal or not horizontal). (B) On lattice booms that are not horizontal. (C) On horizontal lattice booms where the fall distance is 15 feet or more. (2) While at a work station on any part of the equipment (including the boom, of any type), except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	
(f) For assembly/disassembly work, the	(f) For assembly/disassembly work, the	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	
(g) Anchorage criteria. (1) Sections 1926.502(d)(15) and 1926.502(e)(2) apply to equipment covered by this subpart only to the extent delineated in paragraph (g)(2) of this section. (2) Anchorages for personal fall arrest and positioning device systems. (i) Personal fall arrest systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(d)(15) would not be met. (ii) Positioning device systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(e)(2) would not be met. (iii) Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in § 1926.502(d)(15) for personal fall arrest systems and § 1926.502(e)(2) for positioning device systems. (3) Anchorages for fall restraint systems. Fall restraint systems must be anchored to any part	(g) Anchorage criteria. (1) Sections Section 1670(b)(10) and 1670(c)(4) apply to equipment covered by this section only to the extent delineated in subsection (g)(2) of this section. (2) Anchorages for personal fall arrest and positioning device systems. (A) Personal fall arrest systems shall be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, would conclude that the criteria in Section 1670(b)(10) would not be met. (B) 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 Section 1670(c)(4) would not be met. (C) Attachable anchor devices (portable anchor devices that are attached to the equipment) shall meet the anchorage criteria in Section 1670(b)(10) for personal fall arrest systems and Section 1670(c)(4) for positioning device systems. (3) Anchorages for fall restraint systems. Fall restraint systems shall be anchored to any part	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	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.	
(h) Tower cranes. (1) For work other than erecting, climbing, and dismantling, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck. (2) For erecting, climbing, and dismantling work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level. (i) [Reserved.]	(h) Tower cranes. (1) 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/working surface with an unprotected side or edge more than 7-1/2 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck. (2) For erecting, climbing, and dismantling work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level.	
(j) Anchoring to the load line. A personal fall arrest system is permitted to be anchored to the crane/derrick's hook (or other part of the load line) where all of the following requirements are met: (1) A qualified person has determined that the set-up and rated capacity of the crane/derrick (including the hook, load line and rigging) meets or exceeds the requirements in § 1926.502(d)(15). (2) The equipment operator must be at the work site and informed that the equipment is being used for this purpose.		This practice is not allowed in CA.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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).		
(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: (1) the requirements in this subpart that address fall protection. (2) the applicable requirements in §§ 1926.500 and 1926.502.		This is covered by Section 3203(a)(7).
§ 1926.1424 Work area control.	§1616.3. Work area control.	
(a) Swing radius hazards. (1) The requirements in paragraph (a)(2) of this section apply where there are accessible areas in which the equipment's rotating superstructure (whether permanently or temporarily mounted) poses a reasonably foreseeable risk of: (i) Striking and injuring an employee; or (ii) Pinching/crushing an employee against another part of the equipment or another object.	(a) Swing radius hazards. (1) The requirements in subsection (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: (A) Striking and injuring an employee; or (B) Pinching/crushing an employee against another part of the equipment or another object.	Comparable to GISO 4999(j).
(2) To prevent employees from entering these hazard areas, the employer must: (i) Train each employee assigned to work on or near the equipment (''authorized personnel'') in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure.	(2) To prevent employees from entering these hazard areas, the employer shall: (A) 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.	(B) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas.	Training is covered by 3203(a)(7)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	*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 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 shall train each employee to understand what these markings signify.	
(3) Protecting employees in the hazard area. (i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location. (ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator must not rotate the superstructure until the operator is informed in accordance with a prearranged system of communication that the employee is in a safe position.	(3) Protecting employees in the hazard area. (A) 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/she is going to that location. (B) Where the operator knows that an employee went to a location covered by paragraph subsection (a)(1) of this section, 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.	
(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.	(b) When there is a potential for accidental contact by cranes operating within the boom swing radii of one another, the employer shall ensure effective communication to notify crane operators and signal persons of the presence of other cranes to coordinate operations. (1) Where two-way radios are used, a dedicated frequency shall be provided for communication among operators.	Copied from GISO 5001(f) which is more protective.
§ 1926.1425 Keeping clear of the load.	§1616.4. Overhead Loads.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads must be used, to the extent consistent with public safety.	(a) Operations shall be conducted and the job controlled in a manner that will avoid exposure of employees to the hazard of overhead loads. Wherever loads must be passed directly over workers, occupied work spaces or occupied passageways, safety type hooks or equivalent means of preventing the loads from becoming disengaged shall be used. NOTE: Employees should not work in the area directly beneath a suspended load.	Copied from GISO 5002 for consistency between CSO and GISO.
(b) While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees:	(b) While the operator is not moving a suspended load, no employee shall be within the fall zone, except for employees:	
(1) Engaged in hooking, unhooking or guiding a load; (2) Engaged in the initial attachment of the load to a component or structure; or (3) Operating a concrete hopper or concrete bucket.	(1) Engaged in hooking, unhooking or guiding a load; (2) Engaged in the initial attachment of the load to a component or structure; or (3) Operating a concrete hopper or concrete bucket.	
(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, all of the following criteria must be met: (1) The materials being hoisted must be rigged to prevent unintentional displacement.	(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 shall be met: (1) The materials being hoisted shall be rigged to prevent unintentional displacement.	
(2) Hooks with self-closing latches or their equivalent must be used.		Self-closing hooks covered in 5002(a) and 1616.4(a) above.
Exception: ‘‘J’’ hooks are permitted to be used for setting wooden trusses.		This exception not allowed by T8.
(3) The materials must be rigged by a qualified rigger.	(2) The materials shall be rigged by a qualified rigger.	
(d) Receiving a load. Only employees needed to receive a load are permitted to be within the	(d) Receiving a load. Only employees needed to receive a load shall be permitted to be within	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
fall zone when a load is being landed.	the fall zone when a load is being landed.	
(e) During a tilt-up or tilt-down operation: (1) No employee must be directly under the load. (2) Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: (1) Physically guide the load; (2) closely monitor and give instructions regarding the load's movement; or (3) either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing). Note: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see § 1926.1426.	(e) During a tilt-up or tilt-down operation: (1) No employee shall be directly under the load. (2) Only employees essential to the operation 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: (A) Physically guide the load; (B) Closely monitor and give instructions regarding the load's movement; or (C) 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 Section 1616.5.	
§ 1926.1426 Free fall and controlled load lowering.	§1616.5. Free fall and controlled load lowering.	
(a) Boom free fall prohibitions. (1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (i) An employee is in the fall zone of the boom or load. (ii) An employee is being hoisted.	(a) Boom free fall prohibitions. (1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances: (A) An employee is in the fall zone of the boom or load. (B) An employee is being hoisted.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(iii) The load or boom is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line; or any part of the area extending the Table A clearance distance to each side of the power line is within the radius of vertical travel of the boom or the load. (iv) The load is over a shaft, except where there are no employees in the shaft. (v) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load. (vi) Lifting operations are taking place in a refinery or tank farm.	(C) The load or boom is directly over a power line, or over any part of the area extending the Table A of Section 1612.1 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. (D) The load is over a shaft, except where there are no employees in the shaft. (E) The load is over a cofferdam, except where there are no employees in the fall zone of the boom or the load. (F) Lifting operations are taking place in a refinery or tank farm.	
(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in paragraph (a)(1) of this section are present and: (i) The equipment was manufactured prior to October 31, 1984; or (ii) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.	(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 subsection (a)(1) are present and: (A) The equipment was manufactured prior to October 31, 1984; or (B) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.	
(b) Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:	(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 shall have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:	
(1) Friction drums must have: (i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (ii) A secondary braking or locking device,	(1) Friction drums shall have: (A) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (B) A secondary braking or locking device,	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart. (4) Hydraulic boom cylinders must have an integrally mounted holding device.	which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors shall be considered brake or locking devices for purposes of this Article 15. (4) Hydraulic boom cylinders shall have an integrally mounted holding device.	
(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.	(c) Preventing uncontrolled retraction. Hydraulic telescoping booms shall have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.	
(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: (1) An employee is directly under the load. (2) An employee is being hoisted. (3) The load is directly over a power line, or over any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line; or any part of the area extending the Table A of § 1926.1408 clearance distance to each side of the power line is within the radius of vertical travel of the load. (4) The load is over a shaft. (5) The load is over a cofferdam, except where	(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: (1) An employee is directly under the load. (2) An employee is being hoisted. (3) The load is directly over a power line, or over any part of the area extending the Table A of Section 1612.1 clearance distance to each side of the power line; or any part of the area extending the Table A of Section 1612.1 clearance distance to each side of the power line is within the radius of vertical travel of the load. (4) The load is over a shaft. (5) The load is over a cofferdam, except where	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
there are no employees in the fall zone of the load.	there are no employees in the fall zone of the load.	
§ 1926.1427 Operator qualification and certification.	§1618.1. Operator qualification and certification.	
(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:	(a) Qualifications and Certification. The employer shall ensure that, prior to operating any equipment covered under CSO Article 15, the person is operating the equipment during a training period in accordance with subsection (d) of this section, or the operator is qualified or certified to operate the equipment in accordance with the following:	Fed verbiage copied.
(1) When a non-military government entity issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements of paragraphs (e)(2) and (j) of this section, the equipment operator must either be: (i) Licensed by that government entity for operation of equipment within that entity's jurisdiction; or (ii) qualified in compliance with paragraph (d) of this section.	(a)(1) When a non-military government entity issues operator licenses for equipment covered under this Article, and that government licensing program meets the requirements of subsections (c)(2) and (b)(1)(C) and (D) of this section, the equipment operator shall be licensed by that government entity for operation of equipment within that entity's jurisdiction.	Fed verbiage copied except (a)(1)(ii) is not an option in CA.
(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)(2) Where subsection (a)(1) of this section is not applicable, the certification or qualification shall comply with subsection (b) of this section.	Fed verbiage copied.
(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	EXCEPTIONS TO SECTION 1618.1: (1) Operator qualification or certification under this section is not required for operation of derricks, side boom cranes or equipment with a maximum manufacturer-rated hoisting/lifting	Exception 1 is fed verbiage.

SOURCE OF FEDERAL OSHA STANDARD(S):_

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FEDERAL: §1926	STATE:	RATIONALE
hoisting/ lifting capacity of 2,000 pounds or less (see § 1926.1441).	capacity of 2000 pounds or less.	
	(2) Operator qualification or certification under this section is not required for operation of articulating/knuckle-boom cranes having a boom length of less than 25 feet or a maximum rated load capacity of less than 15,000 pounds when used to deliver material to a construction site.	Exception 2 is GISO 5006.1 Ex. 1, modified to provide limited federal exception for knuckle-boom cranes, consistent with current CA enforcement for knuckle-boom cranes.
(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.	(a)(3) Whenever operator qualification or certification is required under this section, the employer shall provide the qualification or certification at no cost to operators who are employed by the employer on [Effective date].	Fed verbiage copied.
(b) Option (1): Certification by an accredited crane operator testing organization. (1) For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/ equipment and personnel have been met.	(b) Option (1): Certification by an accredited crane operator certifying entity. *** 1618.1(b)(3) A certifying entity is any organization whose certification program is accredited by either the National Commission for Certifying Agencies (NCCA), or the American National Standards Institute (ANSI). ANSI accreditation shall be in accordance with the requirements of the ANSI, International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) 17024:2003(E), Conformity Assessment-General Requirements for Bodies Operating Certification of Persons, which is hereby incorporated by reference.	
(ii) Administer written and practical tests that: (A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in	1618.1(b)(1)(C) Pass a written examination developed, validated, and administered in accordance with the Standards for Educational	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
paragraphs (j)(1) and (2) of this section. (B) Provide different levels of certification based on equipment capacity and type.	and Psychological Testing (Copyright 1999) published jointly by the Joint Committee of the American Educational Research Association, the American Psychological Association, and the National Council in Measurement in Education. The exam shall test knowledge and skills identified as necessary for safe crane operations and shall, at a minimum, include the following: 1. Operational characteristics and controls, including characteristic and performance questions appropriate to the crane type for which qualification is sought; 2. Emergency control skills, such as a response to fire, power line contact, loss of stability, or control malfunction; 3. A demonstration of basic arithmetic skills necessary for crane operation and the ability to read and comprehend the crane manufacturer's operation and maintenance instruction materials, including load capacity information (load charts) for the crane for which certification is sought; 4. Knowledge of chapters 5-0 through 5-3 of The American Society of Mechanical Engineers (ASME) B30.5-2000 and B30.5a-2002 Addenda to the standard for mobile and locomotive cranes or chapters 4-0 through 4-3 of the ASME B30.4-1996 standard for portal, tower, and pedestal cranes or Chapter 3-3 of the ASME B 30.3-1996 standard for Construction Tower Cranes, depending on the type of crane(s) the operator intends to operate. (D) Pass a "hands-on" examination to	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	demonstrate proficiency in operating the specific type of crane, which at a minimum shall include pre-start and post-start inspection, maneuvering skills, shutdown, and securing procedures.	
(iii) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified.	1618.1(b)(5) The accredited certifying entity shall have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified.	Fed verbiage copied.
(iv) Have testing procedures for recertification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section.	1618.1(b)(4) Re-certification. Crane operators shall re-certify every five (5) years and shall be required to meet all of the qualifications set forth in subsection (b)(1). Operators with at least one-thousand (1,000) hours of documented experience operating the specific type of crane for which re-certification is sought as covered by this section during the immediately preceding certification period and who meet the physical examination, substance abuse, and written examination requirements set forth in subsections 1618.1(b)(1)(A) - (b)(1)(C) of this section shall not be required to take the "hands-on" examination specified in subsection (b)(1)(D) to re-certify.	Copied from 5006.1(d)
(v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.	1618.1(b)(3)(A) The accredited certifying entity shall have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.	Fed verbiage copied.
(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	1618.1(b)(2)(A) An operator will be deemed qualified to operate a particular piece of equipment if the operator is certified under subsection (b) of this section for that type and capacity of equipment or for higher-capacity equipment of that type. If no accredited testing	Fed verbiage copied.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	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 shall state the type/capacity of equipment for which the operator is certified.	
(3) A certification issued under this option is portable and meets the requirements of paragraph (a)(2) of this section.	1618.1(b)(2)(B) A certification issued under this option (Option 1) is portable and meets the requirements of subsection (a)(2).	Fed verbiage copied.
(4) A certification issued under this paragraph is valid for 5 years.	1618.1(b)(2) Certification. Certificates shall be valid for a maximum of five (5) years. An Accredited Certifying Entity shall issue the certificate of competency to operators who successfully demonstrate the qualifications set forth in subsection (b)(1)(A) - (b)(1)(D) of this section.	Copied from 5006.1(b).
(c) Option (2): Qualification by an audited employer program. The employer's qualification of its employee must meet the following requirements: (1) The written and practical tests must be either: (i) Developed by an accredited crane operator testing organization (see paragraph (b) of this section); or (ii) Approved by an auditor in accordance with the following requirements: (A) The auditor is certified to evaluate such tests by an accredited crane operator testing organization (see paragraph (b) of this section). (B) The auditor is not an employee of the		Federal Option 2, Employer certification, is permissible in CA subject to the same requirements as in 1618.1(b) above.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
employer. (C) The approval must be based on the auditor's determination that the written and practical tests meet nationally recognized test development criteria and are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (D) The audit must be conducted in accordance with nationally recognized auditing standards. (2) Administration of tests. (i) The written and practical tests must be administered under circumstances approved by the auditor as meeting nationally recognized test administration standards. (ii) The auditor must be certified to evaluate the administration of the written and practical tests by an accredited crane operator testing organization (see paragraph (b) of this section). (iii) The auditor must not be an employee of the employer. (iv) The audit must be conducted in accordance with nationally recognized auditing standards. (3) The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter. (4) The employer program must have testing procedures for re-qualification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. The re-qualification procedures must be audited in accordance with paragraphs (c)(1) and (2) of this section.		

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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. (ii) The program is audited again within 180 days of the confirmation that the deficiency was corrected. (iii) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor’s determination that there is a deficiency. (iv) Records of the audits of the employer’s program are maintained by the auditor for three years and are made available by the auditor to the Secretary of Labor or the Secretary’s designated representative upon request. (6) A qualification under this paragraph is: (i) Not portable. Such a qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the qualification. (ii) Valid for 5 years.		
(d) Option (3): Qualification by the U.S. military. (1) For purposes of this section, an operator 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		Option 3 is N/A: CA does not have jurisdiction over work conducted on military installations.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
employee of the Department of Defense or Armed Forces and does not include employees of private contractors. (2) A qualification under this paragraph is: (i) Not portable. Such a qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the qualification. (ii) Valid for the period of time stipulated by the issuing entity.		
(e) Option (4): Licensing by a government entity. (1) For purposes of this section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane operator testing organization if the criteria in paragraph (e)(2) of this section are met. (2) Licensing criteria. (i) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (ii) The testing meets industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel. (iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i)	(c) Option (2): Licensing by a government entity. (1) For purposes of this section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane operator testing organization if the criteria in subsection (c)(2) of this section are met. (2) Licensing criteria. (A) 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 subsection (b)(1)(C) and (D) of this section. (B) The testing meets industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel. (C) The government authority that oversees the licensing department/office, has determined that the requirements in subsections (c)(2)(A)	Fed verbiage copied.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
and (ii) of this section have been met. (iv) The licensing department/office has testing procedures for re-licensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (3) A license issued by a government accredited crane operator testing organization that meets the requirements of this option: (i) Meets the operator qualification requirements of this section for operation of equipment only within the jurisdiction of the government entity. (ii) Is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.	and (B) of this section have been met. (D) 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 subsection (b)(1)(C) and (D) of this section. (3) A license issued by a government accredited crane operator testing organization that meets the requirements of this option: (A) Meets the operator qualification requirements of this section for operation of equipment only within the jurisdiction of the government entity. (B) Is valid for the period of time stipulated by the licensing department/ office, but no longer than 5 years.	
(f) Pre-qualification/certification training period. An employee who is not qualified or certified under this section is permitted to operate equipment only as an operator-in-training and only where the requirements of this paragraph are met. (1) The employer must provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer. (2) The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training's ability.	(d) 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 subsection are met. (1) The employer shall provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer. (2) The tasks performed by the operator-in-training while operating the equipment shall be within the operator-in-training's ability.	Fed verbiage copied.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(3) Trainer. While operating the equipment, the operator-in-training must be continuously monitored by an individual (‘‘operator’s trainer’’) who meets all of the following requirements: (i) The operator’s trainer is an employee or agent of the operator-in-training’s employer. (ii) The operator’s trainer is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment’s controls. (iii) While monitoring the operator-in-training, the operator’s trainer performs no tasks that detract from the trainer’s ability to monitor the operator-in-training.	(3) Trainees may be authorized to operate equipment provided they are under the direct supervision of an operator possessing a valid certificate of competency for the type of crane operated by the trainee. The term direct supervision means the supervising operator is in the immediate area of the trainee and within visual sighting distance and able to effectively communicate with the trainee. When performing direct supervision, the supervising operator shall have no other duties other than to observe the operation of the crane by the trainee. (A) The operator’s trainer shall be an employee or agent of the operator-in-training’s employer.	1618.1(d)(3) copied from 5006.1(e) 1618.1(d)(3)(A) is fed verbiage from (3)(i).
(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.	(B) For equipment other than tower cranes: The operator’s trainer and the operator-in-training shall be in direct line of sight of each other. In addition, they shall communicate verbally or by hand signals. For tower cranes: The operator’s trainer and the operator-in-training shall be in direct communication with each other.	Copied fed verbiage.
(4) Continuous monitoring. The operator-in-training must be monitored by the operator’s trainer at all times, except for short breaks where all of the following are met: (i) The break lasts no longer than 15 minutes and there is no more than one break per hour. (ii) Immediately prior to the break the operator’s trainer informs the operator-in-training of the specific tasks that the operator-	1618.1(d)(3) …The term direct supervision means the supervising operator is in the immediate area of the trainee and within visual sighting distance and able to effectively communicate with the trainee. When performing direct supervision, the supervising operator shall have no other duties other than to observe the operation of the crane by the trainee.	Follow state verbiage. The operator-in-training is not permitted to operate the equipment while the trainer is on break.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
in-training is to perform and limitations to which he/she must adhere during the operator trainer's break. (iii) The specific tasks that the operator-in-training will perform during the operator trainer's break are within the operator-in-training's abilities.		
(5) The operator-in-training must not operate the equipment in any of the following circumstances unless the exception stated in paragraph (f)(5)(v) of this section is applicable: (i) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone (see § 1926.1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV. (ii) If the equipment is used to hoist personnel. (iii) In multiple-equipment lifts. (iv) If the equipment is used over a shaft, cofferdam, or in a tank farm. (v) In multiple-lift rigging operations, except where the operator's trainer determines that the operator-in-training skills are sufficient for this high-skill work.	(C) The operator-in-training shall not operate the equipment in any of the following circumstances unless the exception stated in subsection (d)(3)(C)5 of this section is applicable: 1. 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 Section 1612.1(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. 2. If the equipment is used to hoist personnel. 3. In multiple-equipment lifts. 4. If the equipment is used over a shaft, cofferdam, or in a tank farm. 5. 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.	Fed verbiage copied.
(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.		This option is not permitted in CA.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(h) Language and Literacy Requirements. (1) Tests under this section may be administered verbally, with answers given verbally, where the operator candidate: (i) Passes a written demonstration of literacy relevant to the work. (ii) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification. (2) Tests under this section may be administered in any language the operator candidate understands, and the operator's certificate must note the language in which the test was given. The operator is qualified under paragraph (b)(2) of this section to operate equipment that is furnished with materials required by this subpart that are written in the language of the certification. The operator may only operate equipment furnished with such materials. (i) [Reserved.]		Written tests are required in CA.
(j) Certification criteria. Qualifications and certifications must be based, at a minimum, on the following: (1) A determination through a written test that: (i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including all of the following: (A) The controls and operational/ performance characteristics. (B) Use of, and the ability to calculate	1618.1(b)(1)(C) Pass a written examination developed, validated, and administered in accordance with the Standards for Educational and Psychological Testing (Copyright 1999) published jointly by the Joint Committee of the American Educational Research Association, the American Psychological Association, and the National Council in Measurement in Education. The exam shall test knowledge and skills identified as necessary for safe crane operations and shall, at a minimum, include the	Copied from 5006.1(a)(3) supplemented with (j)(1)(i)(C) and (E) for equivalency.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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. (D) Technical knowledge similar to the subject matter criteria listed in Appendix C of this subpart applicable to the specific type of equipment the individual will operate. Use of the Appendix C criteria meets the requirements of this provision. (E) Technical knowledge applicable to: (1) The suitability of the supporting ground and surface to handle expected loads. (2) Site hazards. (3) Site access. (F) This subpart, including applicable incorporated materials. (ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i) of this section.	following: 1. Operational characteristics and controls, including characteristic and performance questions appropriate to the crane type for which qualification is sought; 2. Emergency control skills, such as a response to fire, power line contact, loss of stability, or control malfunction; 3. A demonstration of basic arithmetic skills necessary for crane operation and the ability to read and comprehend the crane manufacturer's operation and maintenance instruction materials, including load capacity information (load charts) for the crane for which certification is sought; 4. Knowledge of chapters 5-0 through 5-3 of The American Society of Mechanical Engineers (ASME) B30.5-2000 and B30.5a-2002 Addenda to the standard for mobile and locomotive cranes or chapters 4-0 through 4-3 of the ASME B30.4-1996 standard for portal, tower, and pedestal cranes or Chapter 3-3 of the ASME B 30.3-1996 standard for Construction Tower Cranes, depending on the type of crane(s) the operator intends to operate. 5. Procedures for preventing and responding to power line contact. 6. Technical knowledge applicable to: (i) The suitability of the supporting ground and surface to handle expected loads. (ii) Site hazards. (iii) Site access.	
(2) A determination through a practical test that the individual has the skills necessary for safe	1618.1(b)(1)(D) Pass a "hands-on" examination to demonstrate proficiency in operating the	State verbiage for 5006.1(a) (4) amended with Fed requirements of (j)(2)(i) – (iv).

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
operation of the equipment, including the following: (i) Ability to recognize, from visual and auditory observation, the items listed in § 1926.1412(d) (shift inspection). (ii) Operational and maneuvering skills. (iii) Application of load chart information. (iv) Application of safe shut-down and securing procedures.	specific type of crane, which at a minimum shall include the following: 1. Ability to recognize, from visual and auditory observation, the items listed in Section 1613.4 (shift inspection). 2. Operational and maneuvering skills. 3. Application of load chart information. 4. Application of safe shut-down and securing procedures.	
(k) Phase-in.	(e) Effective Dates and Phase-in. (1) Mobile and tower crane operator qualifications and certification shall be in accordance with the provisions of General Industry Safety Orders, Section 5006.1 effective June 1, 2005, until [Effective date plus four years] when the provisions of this section become applicable.	Maintains GISO 5006.1 effective date for cranes previously covered by that standard.
(1) The provisions of this section are applicable November 8, 2010, except for paragraphs (a)(2) and (f) which are applicable November 10, 2014.	(2) The provisions of this section are applicable [Effective date], except for subsections (a)(2) and (d) which are applicable [Effective date plus four years].	New CSO effective dates going forward.
(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:	(3) When subsection (a)(1) is not applicable, the following requirements shall apply until [Effective date plus four years]:	Modified federal verbiage (equally effective).
(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	(A) The employer shall ensure that operators of equipment covered by this standard are competent to operate the equipment safely. (B) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employer shall train that employee prior to operating the equipment. The employer	Fed verbiage.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
must ensure that each operator is evaluated to confirm that he/she understands the information provided in the training.	shall ensure that each operator is evaluated to confirm that he/she understands the information provided in the training.	
§ 1926.1428 Signal person qualifications.	§1618.2. Signal Person Qualifications.	Adopt fed verbiage.
(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) The employer of the signal person shall ensure that each signal person meets the Qualification Requirements [subsection (c)] prior to giving any signals. This requirement shall be met by using either Option (1) or Option (2) of this section.	
(1) *Option (1)—Third party qualified evaluator*. The signal person has documentation from a third party qualified evaluator (*see* Qualified Evaluator (third party), § 1926.1401 for definition) showing that the signal person meets the Qualification Requirements (see paragraph (c) of this section).	(1) *Option (1) – Third party qualified evaluator*. The signal person has documentation from a third party qualified evaluator [*see* Qualified Evaluator (third party), Section 1610.3 for definition] showing that the signal person meets the Qualification Requirements [see subsection (c)].	
(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.	(2) *Option (2)—Employer's qualified evaluator*. The employer's qualified [see Qualified Evaluator (not a third party), Section 1610.3 for definition] evaluator assesses the individual and determines that the individual meets the Qualification Requirements [see subsection (c)] and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable – other employers are not permitted to use it to meet the requirements of this section.	
(3) The employer must make the documentation for whichever option is used available at the site while the signal person is employed by the employer. The documentation	(3) 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of subsection (c).	
(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.	(b) If subsequent actions by the signal person indicate that the individual does not meet the Qualification Requirements [see subsection (c)], the employer shall not allow the individual to continue working as a signal person until re-training is provided and a reassessment is made in accordance with subsection (a) of this section that confirms that the individual meets the Qualification Requirements.	
(c) Qualification Requirements. Each signal person must: (1) Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals. (2) Be competent in the application of the type of signals used. (3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads. (4) Know and understand the relevant requirements of § 1926.1419 through § 1926.1422 and § 1926.1428. (5) Demonstrate that he/she meets the requirements in paragraphs (c)(1) through (4) of this section through an oral or written test, and through a practical test.	(c) Qualification Requirements. Each signal person shall: (1) 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. (2) Be competent in the application of the type of signals used. (3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads. (4) Know and understand the relevant requirements of Section 1617.1 through Section 1617.3 and Section 1618.2. (5) Demonstrate that he/she meets the requirements in subsection (c)(1) through (4) of this section through an oral or written test, and through a practical test.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
§ 1926.1429 Qualifications of maintenance & repair employees.	§1618.3 Qualifications of Maintenance and Repair Employees.	Adopt fed verbiage.
(a) Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following requirements are met:	(a) Maintenance, inspection and repair personnel are permitted to operate the equipment only where all of the following requirements are met:	
(1) The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance. (2) The personnel either: (i) Operate the equipment under the direct supervision of an operator who meets the requirements of § 1926.1427 (Operator qualification and certification); or (ii) Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment. (b) Maintenance and repair personnel must meet the definition of a qualified person with respect to the equipment and maintenance/ repair tasks performed.	(1) The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance. (2) The personnel either: (A) Operate the equipment under the direct supervision of an operator who meets the requirements of Section 1618.1 (Operator Qualification and Certification); or (B) Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment. (b) Maintenance and repair personnel shall meet the definition of a qualified person with respect to the equipment and maintenance/ repair tasks performed.	
§ 1926.1430 Training.	§1618.4. Training.	Adopt fed verbiage.
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 § 1926.1428(c) in the areas addressed in that paragraph.	The employer shall provide training as follows: (a) Overhead power lines. The employer shall train each employee specified in Section 1612.1(g) in the topics listed in Section 1612.1(g). (b) Signal persons. The employer shall train each employee who will be assigned to work as a signal person who does not meet the requirements of Section 1618.2(c) in the areas addressed in that section.	No state counterpart for 1926.1410(m) – liveline work not permitted in CA.
(c) Operators.	(c) Operators.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) *Operators-in-Training for equipment where certification or qualification is required by this subpart.* The employer must train each operator-in-training in the areas addressed in §1926.1427(j). The employer must provide re-training if the operator-in-training does not pass a qualification or certification test. (2) Transitional Period. During the four-year phase-in period for operator certification or qualification, as provided in § 1926.1427(k), employers must train each operator who has not yet been certified or qualified in the areas addressed in § 1926.1427(j). (3) Operators excepted from the requirements of § 1926.1427. The employer must train each operator excepted under § 1926.1427(a) from the requirements of § 1926.1427 on the safe operation of the equipment the operator will be using. (4) The employer must train each operator of the equipment covered by this subpart in the following practices: (i) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment with a boom, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary. See § 1926.1417(f) and (j) for additional requirements.	(1) *Operators-in-Training for equipment where certification or qualification is required by this Article.* The employer shall train each operator-in-training in the areas addressed in §1618.1(b)(1)(C) and (D). The employer shall provide re-training if the operator-in-training does not pass a qualification or certification test. (2) *Transitional Period*. During the four-year phase-in period for operator certification or qualification, as provided in Section 1618.1(e), employers shall train each operator who has not yet been certified or qualified in the areas addressed in Section 1618.1(b)(1)(C) and (D). (3) *Operators excepted from the requirements of Section 1618.1*. The employer shall train each operator excepted under Section 1618.1(a) from the requirements of Section 1618.1 on the safe operation of the equipment the operator will be using. (4) The employer shall train each operator of the equipment covered by this subpart in the following practices: (A) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist 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 Section 1616.1(g) and (j) for additional requirements.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.	(B) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.	
(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. (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). (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).	(d) Competent persons and qualified persons. The employer shall train each competent person and each qualified person regarding the requirements of this subpart applicable to their respective roles. (e) Crush/pinch points. The employer shall train each employee who works with the equipment to keep clear of holes, and crush/ pinch points and the hazards addressed in Section 1616.3 (Work area control). (f) Tag-out. The employer shall 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 Sections 1616.1(g) and (h).	
(g) Training administration. (1) The employer must evaluate each employee required to be trained under this subpart to confirm that the employee understands the information provided in the training. (2) The employer must provide refresher training in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary. (3) Whenever training is required under subpart CC, the employer must provide the training at no cost to the employee.	(g) Training administration. (1) The employer shall evaluate each employee required to be trained under this subpart to confirm that the employee understands the information provided in the training. (2) The employer shall 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. (3) Whenever training is required under this Article, the employer shall provide the training at no cost to the employee.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

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FEDERAL: §1926	STATE:	RATIONALE
§ 1926.1431 Hoisting personnel.	§1616.6. Hoisting Personnel.	
The requirements of this section are supplemental to the other requirements in this subpart and apply when one or more employees are hoisted. (a) The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the 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.	The requirements of this section are supplemental to the other requirements in this Article and apply when one or more employees are hoisted. (a) The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the 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 subsection does not apply to work covered by CSO Section 1710, Steel Erection.	
(b) Use of personnel platform. (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. (2) Exceptions: A personnel platform is not required for hoisting employees: (i) Into and out of drill shafts that are up to and including 8 feet in diameter (see paragraph (o) of this section for requirements for hoisting these employees). (ii) In pile driving operations (see paragraph (p) of this section for requirements for hoisting these employees). (iii) Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device (see paragraph (r) of this section for	(b) Use of personnel platform. (1) When using equipment to hoist employees, the employees shall be in a personnel platform that meets the requirements of subsection (e). (2) Exceptions: A personnel platform is not required for hoisting employees: (A) Into and out of drill shafts that are up to and including 8 feet in diameter [see subsection (o) for requirements for hoisting these employees]. (B) In pile driving operations (see subsection (p) for requirements for hoisting these employees). (C) Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device [see subsection (r) for requirements for hoisting these employees]. (D) In storage-tank (steel or concrete), shaft	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
requirements for hoisting these employees). (iv) In storage-tank (steel or concrete), shaft and chimney operations (see paragraph (s) of this section for requirements for hoisting these employees).	and chimney operations [see subsection (s) for requirements for hoisting these employees].	
(c) Equipment set-up. (1) The equipment must be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable. (2) Equipment with outriggers or stabilizers must have them all extended and locked. The amount of extension must be the same for all outriggers and stabilizers and in accordance with manufacturer procedures and load charts.	(c) Equipment set-up. (1) The equipment shall be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable. (2) Equipment with outriggers or stabilizers shall have them all extended and locked. The amount of extension shall be the same for all outriggers and stabilizers and in accordance with manufacturer procedures and load charts.	
(d) Equipment criteria. (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. (2) Capacity: Use of boom-attached personnel platforms. The total weight of the loaded personnel platform must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing). (3) Capacity: Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to paragraph (b)(2) of this section, the total load (including the hook, load line, rigging and any	(d) Equipment criteria. (1) Capacity: Use of suspended personnel platforms. The total load (with the platform loaded, including the hook, load line and rigging) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing. (2) Capacity: Use of boom-attached personnel platforms. The total weight of the loaded personnel platform shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing). (3) Capacity: Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to subsection (b)(2) of this section, the total load (including the hook, load line, rigging and any	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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. (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.	other equipment that imposes a load) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing. (4) When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes shall be engaged.	
(5) Devices. (i) Equipment (except for derricks and articulating cranes) with a variable angle boom must be equipped with all of the following: (A) A boom angle indicator, readily visible to the operator, and (B) A boom hoist limiting device. (ii) Articulating cranes must be equipped with a properly functioning automatic overload protection device. (iii) Equipment with a luffing jib must be equipped with: (A) A jib angle indicator, readily visible to the operator, and. (B) A jib hoist limiting device. (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. (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	(5) Devices. (A) Equipment (except for derricks and articulating cranes) with a variable angle boom shall be equipped with all of the following: 1. A boom angle indicator, readily visible to the operator, and 2. A boom hoist limiting device. (B) Articulating cranes shall be equipped with a properly functioning automatic overload protection device. (C) Equipment with a luffing jib shall be equipped with: 1. A jib angle indicator, readily visible to the operator, and. 2. A jib hoist limiting device. (D) Equipment with telescoping booms shall be equipped with a device to indicate the boom's extended length clearly to the operator, or shall have measuring marks on the boom. (E) Anti two-block. A device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) shall	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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. (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). (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.)	be used. The device(s) shall 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, subsection (p)(2) of this section specifies how to prevent two-blocking during such operations. (F) Controlled load lowering. The load line hoist drum shall have a system, other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism. This system or device shall be used when hoisting personnel. Note: Free fall of the load line hoist is prohibited (see Section 1616.5(d); the use of equipment in which the boom hoist mechanism can free fall is also prohibited (see Section 1616.5(a)(1). (G) Proper operation required. Personnel hoisting operations shall not begin unless the devices listed in this section are in proper working order. If a device stops working properly during such operations, the operator shall safely stop operations. Personnel hoisting operations shall not resume until the device is again working properly. Alternative measures are not permitted. (See Section 1616.1 for tag-out and related requirements.)	
(6) Direct attachment of a personnel platform to a luffing jib is prohibited.	(6) Direct attachment of a personnel platform to a luffing jib is prohibited.	
(e) Personnel platform criteria. (1) A qualified person familiar with structural design must design the personnel platform and attachment/suspension system used for hoisting	(e) Personnel platform criteria. (1) A qualified person familiar with structural design shall design the personnel platform and attachment/suspension system used for hoisting	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
personnel. (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. (3) The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform. (4) The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (5) All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design. (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 1⁄2 inch (1.27 cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part. (7) A grab rail must be installed inside the entire perimeter of the personnel platform except for access gates/doors. (8) Access gates/doors. If installed, access gates/doors of all types (including swinging,	personnel. (2) The system used to connect the personnel platform to the equipment shall allow the platform to remain within 10 degrees of level, regardless of boom angle. (3) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform. (4) The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (5) All welding of the personnel platform and its components shall be performed by a certified welder familiar with the weld grades, types and material specified in the platform design. (6) The personnel platform shall be equipped with a guardrail system which meets the requirements of Article 16 of these Orders, and shall be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than 1⁄2 inch (1.27 cm). Points to which personal fall arrest systems are attached shall meet the anchorage requirements in Article 24 of these Orders. (7) A grab rail shall be installed inside the entire perimeter of the personnel platform except for access gates/doors. (8) Access gates/doors. If installed, access gates/doors of all types (including swinging,	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
sliding, folding, or other types) must: (i) Not swing outward. If due to the size of the personnel platform, such as a 1-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward. (ii) Be equipped with a device that prevents accidental opening. (9) Headroom must be sufficient to allow employees to stand upright in the platform. (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 1⁄2 inch openings), unless full protection is necessary. (11) All edges exposed to employee contact must be smooth enough to prevent injury. (12) The weight of the platform and its rated capacity must be conspicuously posted on the platform with a plate or other permanent marking.	sliding, folding, or other types) shall: (A) Not swing outward. If due to the size of the personnel platform, such as a 1-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward. (B) Be equipped with a device that prevents accidental opening. (9) Headroom shall be sufficient to allow employees to stand upright in the platform. (10) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects. The platform overhead protection shall not obscure the view of the operator or platform occupants (such as wire mesh that has up to 1⁄2 inch openings), unless full protection is necessary. (11) All edges exposed to employee contact shall be smooth enough to prevent injury. (12) The weight of the platform and its rated capacity shall be conspicuously posted on the platform with a plate or other permanent marking.	
(f) Personnel platform loading. (1) The personnel platform must not be loaded in excess of its rated capacity. (2) Use. (i) Personnel platforms must be used only for employees, their tools, and the materials necessary to do their work. Platforms must not be used to hoist materials or tools when not hoisting personnel.	(f) Personnel platform loading. (1) The personnel platform shall not be loaded in excess of its rated capacity. (2) Use. (A) 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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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. (3) Materials and tools must be: (i) Secured to prevent displacement. (ii) Evenly distributed within the confines of the platform while it is suspended. (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.	(B) Exception: Materials and tools to be used during the lift, if secured and distributed in accordance with subsection (f)(3) of this section may be in the platform for trial lifts. (3) Materials and tools shall be: (A) Secured to prevent displacement. (B) Evenly distributed within the confines of the platform while it is suspended. (4) 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.	
(g) Attachment and rigging. (1) Hooks and other detachable devices. (i) Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be: (A) Of a type that can be closed and locked, eliminating the throat opening. (B) Closed and locked when attached. (ii) Shackles used in place of hooks must be of the alloy anchor type, with either: (A) A bolt, nut and retaining pin, in place; or (B) Of the screw type, with the screw pin secured from accidental removal. (iii) Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the devices addressed in paragraphs (g)(1)(i) and (ii) of this section. Such devices must be closed and locked when attached.	(g) Attachment and rigging. (1) Hooks and other detachable devices. (A) 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: 1. Of a type that can be closed and locked, eliminating the throat opening. 2. Closed and locked when attached. (B) Shackles used in place of hooks shall be of the alloy anchor type, with either: 1. A bolt, nut and retaining pin, in place; or 2. Of the screw type, with the screw pin secured from accidental removal. (C) 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 subsections (g)(1)(A) and (B) of this section. Such devices shall be closed and locked when attached.	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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. (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. (4) Eyes in wire rope slings must be fabricated with thimbles. (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.	(2) Rope bridle. When a rope bridle is used to suspend the personnel platform, each bridle leg shall be connected to a master link or shackle (see subsection (g)(1) of this section) in a manner that ensures that the load is evenly divided among the bridle legs. (3) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks shall be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load. (4) Eyes in wire rope slings shall be fabricated with thimbles. (5) Bridles and associated rigging for suspending the personnel platform shall be used only for the platform and the necessary employees, their tools and materials necessary to do their work. The bridles and associated rigging shall not have been used for any purpose other than hoisting personnel.	
(h) Trial lift and inspection. (1) A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight must be made from ground level, or any other location where employees will enter the platform, to each location at which the platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in	(h) Trial lift and inspection. (1) A trial lift with the unoccupied personnel platform 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 at which the platform is to be hoisted and positioned. Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel. (2) The trial lift must be performed immediately prior to each shift in which personnel will be hoisted. In addition, the trial lift must be repeated prior to hoisting employees in each of the following circumstances: (i) The equipment is moved and set up in a new location or returned to a previously used location. (ii) The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety. (3) The competent person must determine that: (i) Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of §1926.1415 and § 1926.1416. (ii) Nothing interferes with the equipment or the personnel platform in the course of the trial lift. (iii) The lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift. (iv) The load radius to be used during the lift has been accurately determined. (4) Immediately after the trial lift, the competent person must: (i) Conduct a visual inspection of the equipment, base support or ground, and	which the platform is moved sequentially to each location, shall be performed; the method selected shall be the same as the method that will be used to hoist the personnel. (2) The trial lift shall be performed immediately prior to each shift in which personnel will be hoisted. In addition, the trial lift shall be repeated prior to hoisting employees in each of the following circumstances: (A) The equipment is moved and set up in a new location or returned to a previously used location. (B) The lift route is changed, unless the competent person determines that the new route presents no new factors affecting safety. (3) The competent person shall determine that: (A) Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids shall meet the requirements of §1615.1 and 1615.2. (B) Nothing interferes with the equipment or the personnel platform in the course of the trial lift. (C) The lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift. (D) The load radius to be used during the lift has been accurately determined. (4) Immediately after the trial lift, the competent person shall: (A) Conduct a visual inspection of the equipment, base support or ground, and	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect. (ii) Confirm that, upon the completion of the trial lift process, the test weight has been removed. (5) Immediately prior to each lift: (i) The platform must be hoisted a few inches with the personnel and materials/tools on board and inspected by a competent person to ensure that it is secure and properly balanced. (ii) The following conditions must be determined by a competent person to exist before the lift of personnel proceeds: (A) Hoist ropes must be free of deficiencies in accordance with § 1926.1413(a). (B) Multiple part lines must not be twisted around each other. (C) The primary attachment must be centered over the platform. (D) If the load rope is slack, the hoisting system must be inspected to ensure that all ropes are properly seated on drums and in sheaves. (6) Any condition found during the trial lift and subsequent 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.) (i) [Reserved.]	personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect. (B) Confirm that, upon the completion of the trial lift process, the test weight has been removed. (5) Immediately prior to each lift: (A) The platform shall 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. (B) The following conditions shall be determined by a competent person to exist before the lift of personnel proceeds: 1. Hoist ropes shall be free of deficiencies in accordance with Section 1613.10(a). 2. Multiple part lines shall not be twisted around each other. 3. The primary attachment shall be centered over the platform. 4. If the load rope is slack, the hoisting system shall be inspected to ensure that all ropes are properly seated on drums and in sheaves. (6) Any condition found during the trial lift and subsequent inspection(s) that fails to meet a requirement of this standard or otherwise creates a safety hazard shall be corrected before hoisting personnel. (See Section 1616.1 for tag-out and related requirements.) (i) [Reserved.]	
(j) Proof testing. (1) At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must	(j) Proof testing. (1) At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
be proof tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift. (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. (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.) (4) Personnel hoisting must not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.	be proof tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift. (2) The platform shall be lowered by controlled load lowering, braked, and held in a suspended position for a minimum of five minutes with the test load evenly distributed on the platform. (3) After proof testing, a competent person shall inspect the platform and rigging to determine if the test has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging shall not be used to hoist personnel unless the deficiencies are corrected, the test is repeated, and a competent person determines that the test has been passed. (See Section 1616.1 for tag-out and related requirements.) (4) Personnel hoisting shall not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.	
(k) Work practices. (1) Hoisting of the personnel platform must be performed in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform. (2) Platform occupants must: (i) Keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person. (ii) Not stand, sit on, or work from the top or	(k) Work practices. (1) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner, with no sudden movements of the equipment or the platform. (2) Platform occupants must: (A) Keep all parts of the body inside the platform during raising, lowering, and horizontal movement. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person. (B) Not stand, sit on, or work from the top or	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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. (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. (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. (5) Tag lines must be used when necessary to control the platform. (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. (7) Platforms with controls. Where the platform is equipped with controls, all of the following must be met at all times while the platform is occupied: (i) The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation. (ii) The equipment operator must be at a set of equipment controls that include boom and swing functions of the equipment, and must be	intermediate rail or toeboard, or use any other means/device to raise their working height. (C) Not pull the platform out of plumb in relation to the hoisting equipment. (3) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless the employer can demonstrate that securing to the structure would create a greater hazard. (4) If the platform is tied to the structure, the operator shall not move the platform until the operator receives confirmation that it is freely suspended. (5) Tag lines shall be used when necessary to control the platform. (6) Platforms without controls. Where 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. (7) Platforms with controls. Where the platform is equipped with controls, all of the following shall be met at all times while the platform is occupied: (A) 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. (B) The equipment operator shall be at a set of equipment controls that include boom and swing functions of the equipment, and must be	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
on site and in view of the equipment. (iii) The platform operating manual must be in the platform or on the equipment. (8) Environmental conditions. (i) Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person must determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated). (ii) Other weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated). (9) Employees being hoisted must remain in direct communication with the signal person (where used), or the operator. (10) Fall protection. (i) Except over water, employees occupying the personnel platform must be provided and use a personal fall arrest system. The system must be attached to a structural member within the personnel platform. When working over or near water, the requirements of § 1926.106 apply. (ii) The fall arrest system, including the attachment point (anchorage) used to comply with paragraph (i) of this section, must meet the requirements in § 1926.502. (11) Other load lines. (i) No lifts must be made on any other of the	on site and in view of the equipment. (C) The platform operating manual shall be in the platform or on the equipment. (8) Environmental conditions. (A) Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person shall determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation shall not begin (or, if already in progress, shall be terminated). (B) Other weather and environmental conditions. A qualified person shall determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation shall not begin (or, if already in progress, shall be terminated). (9) Employees being hoisted shall remain in direct communication with the signal person (where used), or the operator. (10) Fall protection. (A) Except over water, employees occupying the personnel platform shall be provided with and shall 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 Section 1602 apply. (B) The fall arrest system, including the attachment point (anchorage) used to comply with subsection (k)(10)(A) of this section, shall meet the requirements in Article 24 of these Orders.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
equipment's load lines while personnel are being hoisted, except in pile driving operations. (ii) Factory-produced boom-mounted personnel platforms that incorporate a winch as original equipment. Loads are permitted to be hoisted by such a winch while employees occupy the personnel platform only where the load on the winch line does not exceed 500 pounds and does not exceed the rated capacity of the winch and platform. (12) Traveling—equipment other than derricks. (i) Hoisting of employees while the equipment is traveling is prohibited, except for: (A) Equipment that travels on fixed rails; or (B) Where the employer demonstrates that there is no less hazardous way to perform the work. (C) This exception does not apply to rubber-tired equipment. (ii) Where employees are hoisted while the equipment is traveling, all of the following criteria must be met: (A) Equipment travel must be restricted to a fixed track or runway. (B) Where a runway is used, it must be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the equipment being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria. (C) Equipment travel must be limited to boom length. (D) The boom must be parallel to the direction	(11) Other load lines. (A) No lifts shall be made on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations. (B) 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. (12) Traveling – equipment other than derricks. (A) Hoisting of employees while the equipment is traveling is prohibited, except for: 1. Equipment that travels on fixed rails; or 2. Where the employer demonstrates that there is no less hazardous way to perform the work. 3. This exception does not apply to rubber-tired equipment. (B) Where employees are hoisted while the equipment is traveling, all of the following criteria shall be met: 1. Equipment travel shall be restricted to a fixed track or runway. 2. Where a runway is used, it shall be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the equipment being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria. 3. Equipment travel shall be limited to boom length.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
of travel, except where it is safer to do otherwise. (E) A complete trial run must be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by paragraph (h) of this section which tests the lift route. (13) Traveling—derricks. Derricks are prohibited from traveling while personnel are hoisted. (l) [Reserved.]	4. The boom shall be parallel to the direction of travel, except where it is safer to do otherwise. 5. A complete trial run shall be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by subsection (h) of this section which tests the lift route. (13) Traveling – derricks. Derricks are prohibited from traveling while personnel are hoisted. (l) [Reserved.]	
(m) Pre-lift meeting. A pre-lift meeting must be: (1) Held to review the applicable requirements of this section and the procedures that will be followed. (2) Attended by the equipment operator, signal person (if used for the lift), employees to be hoisted, and the person responsible for the task to be performed. (3) Held prior to the trial lift at each new work location, and must be repeated for any employees newly assigned to the operation.	(m) Pre-lift meeting. A pre-lift meeting shall be: (1) Held to review the applicable requirements of this section and the procedures that will be followed. (2) Attended by the equipment operator, signal person (if used for the lift), employees to be hoisted, and the person responsible for the task to be performed. (3) Held prior to the trial lift at each new work location, and shall be repeated for any employees newly assigned to the operation.	
(n) Hoisting personnel near power lines. Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by subpart V of this part (Power Transmission and Distribution).	(n) Hoisting personnel near power lines. Hoisting personnel within 20 feet of a power line that is up to 350 kV, and hoisting personnel within 50 feet of a power line that is over 350 kV, is prohibited, except for work covered by the High Voltage Electrical Safety Orders.	
(o) Hoisting personnel in drill shafts. When hoisting employees into and out of drill shafts that are up to and including 8 feet in	(o) Hoisting personnel in drill shafts. When hoisting employees into and out of drill shafts that are up to and including 8 feet in	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
diameter, all of the following requirements must be met: (1) The employee must be in either a personnel platform or on a boatswain's chair. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (n). Where the terms ''personnel platform'' or ''platform'' are used in these paragraphs, substitute them with ''boatswain's chair.'' (ii) A signal person must be stationed at the shaft opening. (iii) The employee must be hoisted in a slow, controlled descent and ascent. (iv) The employee must use personal fall protection equipment, including a full body harness, attached independent of the crane/ derrick. (v) The fall protection equipment must meet the applicable requirements in § 1926.502. (vi) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vii) No more than one person must be hoisted at a time.	diameter, all of the following requirements shall be met: (1) The employee shall be in either a personnel platform or on a boatswain's chair. (2) If using a personnel platform, subsections (a) through (n) of this section apply. (3) If using a boatswain's chair: (A) The following subsections of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(A), (f)(3)(A), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(A), (m), (n). Where the terms ''personnel platform'' or ''platform'' are used in these subsections, substitute them with ''boatswain's chair.'' (B) A signal person shall be stationed at the shaft opening. (C) The employee shall be hoisted in a slow, controlled descent and ascent. (D) The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/ derrick. (E) The fall protection equipment shall meet the applicable requirements in Articles 16 and 24 of these Orders. (F) The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (G) No more than one person shall be hoisted at a time.	
(p) Hoisting personnel for pile driving	(p) Hoisting personnel for pile driving	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
operations. When hoisting an employee in pile driving operations, the following requirements must be met: (1) The employee must be in a personnel platform or boatswain's chair. (2) For lattice boom cranes: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. For telescopic boom cranes: Clearly mark the cable (so that it can be easily seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter who is in direct communication with the operator to inform the operator when this point is reached. (3) If using a personnel platform, paragraphs (b) through (n) of this section apply. (4) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (j), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), and (n). Where the terms ''personnel platform'' or ''platform'' are used in these paragraphs, substitute them with ''boatswains chair.'' (ii) The employee must be hoisted in a slow, controlled descent and ascent. (iii) The employee must use personal fall protection equipment, including a full body harness, independently attached to the lower	operations. When hoisting an employee in pile driving operations, the following requirements shall be met: (1) The employee shall be in a personnel platform or boatswain's chair. (2) For lattice boom cranes: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter 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. (3) If using a personnel platform, subsections (b) through (n) of this section apply. (4) If using a boatswain's chair: (A) The following subsections of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(A), (f)(3)(A), (g), (h), (j), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(A), (m), and (n). Where the terms ''personnel platform'' or ''platform'' are used in these subsections, substitute them with ''boatswains chair.'' (B) The employee shall be hoisted in a slow, controlled descent and ascent. (C) The employee shall use personal fall protection equipment, including a full body	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
load block or overhaul ball. (iv) The fall protection equipment must meet the applicable requirements in § 1926.502. (v) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vi) No more than one person must be hoisted at a time. (q) [Reserved.]	harness, independently attached to the lower load block or overhaul ball. (D) The fall protection equipment shall meet the applicable requirements in Article 24 of these Orders. (E) The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (F) No more than one person shall be hoisted at a time. (q) [Reserved.]	
(r) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements must be met: (1) The employee must be in either a personnel platform or a marine-hoisted personnel transfer device. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a marine-hoisted personnel transfer device: (i) The following paragraphs of this section apply: (a), (c)(2), (d)(1), (d)(3), (d)(4), (e)(1) through (5), (e)(12), (f)(1), (g), (h), (j), (k)(1), (k)(8), (k)(9), (k)(10)(ii), (k)(11)(i), (k)(12), (m), and (n). Where the terms ''personnel platform'' or ''platform'' are used in these paragraphs, substitute them with ''marine-hoisted personnel transfer device.'' (ii) The transfer device must be used only for transferring workers.	(r) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements shall be met: (1) The employee shall be in either a personnel platform or a marine-hoisted personnel transfer device. (2) If using a personnel platform, subsections (a) through (n) of this section apply. (3) If using a marine-hoisted personnel transfer device: (A) The following subsections 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)(B), (k)(11)(A), (k)(12), (m), and (n). Where the terms ''personnel platform'' or ''platform'' are used in these subsections, substitute them with ''marine-hoisted personnel transfer device.'' (B) The transfer device shall be used only for transferring workers.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(iii) The number of workers occupying the transfer device must not exceed the maximum number it was designed to hold. (iv) Each employee must wear a U.S. Coast Guard personal flotation device approved for industrial use.	(C) The number of workers occupying the transfer device shall not exceed the maximum number it was designed to hold. (D) Each employee shall wear a U.S. Coast Guard personal flotation device approved for industrial use.	
(s) Hoisting personnel for storage-tank (steel or concrete), shaft and chimney operations. When hoisting an employee in storage tank (steel or concrete), shaft and chimney operations, the following requirements must be met: (1) The employee must be in a personnel platform except when the employer can demonstrate that use of a personnel platform is infeasible; in such a case, a boatswain's chair must be used. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (n). Where the terms ''personnel platform'' or ''platform'' are used in these paragraphs, substitute them with ''boatswains chair.'' (ii) The employee must be hoisted in a slow, controlled descent and ascent. (iii) The employee must use personal fall protection equipment, including a full body harness, attached independent of the crane/ derrick. When there is no adequate structure for attachment of personal fall arrest equipment as required in § 1926.502(d)(15), the attachment	(s) Hoisting personnel for storage-tank (steel or concrete), shaft and chimney operations. When hoisting an employee in storage tank (steel or concrete), shaft and chimney operations, the following requirements shall be met: (1) The employee shall be in a personnel platform except when the employer can demonstrate that use of a personnel platform is infeasible; in such a case, a boatswain's chair shall be used. (2) If using a personnel platform, subsections (a) through (n) of this section apply. (3) If using a boatswain's chair: (A) The following subsections of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(A), (f)(3)(A), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(A), (m), (n). Where the terms ''personnel platform'' or ''platform'' are used in these subsections, substitute them with ''boatswains chair.'' (B) The employee shall be hoisted in a slow, controlled descent and ascent. (C) The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/ derrick. When there is no adequate structure for attachment of personal fall arrest equipment as	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
must be to the lower load block or overhaul ball. (iv) The fall protection equipment must meet the applicable requirements in § 1926.502. (v) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vi) No more than one person must be hoisted at a time.	required in Article 24, the attachment shall be to the lower load block or overhaul ball. (D) The fall protection equipment shall meet the applicable requirements in Articles 16 and 24 of these Orders. (E) The boatswain's chair itself (excluding the personal fall arrest system anchorages), shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (F) No more than one person shall be hoisted at a time.	
§ 1926.1432 Multiple-crane/derrick lifts—supplemental requirements.	§1616.7. Multiple-Crane/Derrick Lifts – Supplemental Requirements.	
(a) Plan development. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be planned. The planning must meet the following requirements: (1) The plan must be developed by a qualified person. (2) The plan must be designed to ensure that the requirements of this subpart are met. (3) Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided.	(a) Plan development. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation shall be planned. The planning shall meet the following requirements: (1) The plan shall be developed by a qualified person. (2) The plan shall be designed to ensure that the requirements of this Article 15 are met. (3) Where the qualified person determines that engineering expertise is needed for the planning, the employer shall ensure that it is provided.	
(b) Plan implementation. (1) The multiple-crane/derrick lift must be directed by a person who meets the criteria for both a competent person and a qualified person, or by a competent person who is assisted by one or more qualified persons (lift director).	(b) When two or more cranes are used to lift one load, a qualified person, other than the operators, shall direct the operation. This person shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be	Verbiage copied from GISO 4994(e).

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) The lift director must review the plan in a meeting with all workers who will be involved with the operation.	made. A qualified person shall be in direct audible communication with both crane operators at all times to direct the lifting operation. Where two cranes or more are used to lift one load, the rating chart shall be reduced on each crane by not less than 25 percent, unless equalizer or other acceptable provisions assure safe distribution of both vertical and horizontal load to the cranes involved, in which case a lesser reduction may be applied.	
§ 1926.1433 Design, construction and testing.	§1610.4. Design, construction and testing.	
The following requirements apply to equipment that has a manufacturer rated hoisting/lifting capacity of more than 2,000 pounds.	The following requirements apply to equipment that has a manufacturer rated hoisting/lifting capacity of more than 2,000 pounds.	
(a) Crawler, truck and locomotive cranes manufactured prior to 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.	(a) Crawler, truck and locomotive cranes manufactured prior to [Effective date] shall meet the applicable requirements for design, construction, and testing as prescribed in the applicable edition of ANSI B30.5 as prescribed by General Industry Safety Orders, Section 4884.	GISO 4884 prescribes more recent editions (prior to Nov 8, 2010). This subsection references standards in effect in CA prior to adoption of the federal rulemaking.
(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: (1) In section 5–1.1.1 (‘‘Load Ratings—Where Stability Governs Lifting Performance’’), paragraphs (a)—(d) (including subparagraphs).	(b) Mobile (including crawler and truck) and locomotive cranes manufactured on or after [Effective date] shall meet the following portions of ASME B30.5-2004 (incorporated by reference) as applicable: (1) In section 5-1.1.1 (‘‘Load Ratings—Where Stability Governs Lifting Performance’’), paragraphs (a)-(d) (including subparagraphs).	Use federal B30.5 adoption after effective date.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) In section 5–1.1.2 (‘‘Load Ratings—Where Structural Competence Governs Lifting Performance’’), paragraph (b). (3) Section 5–1.2 (‘‘Stability (Backward and Forward)’’).	(2) In section 5-1.1.2 (‘‘Load Ratings—Where Structural Competence Governs Lifting Performance’’), paragraph (b). (3) Section 5-1.2 (‘‘Stability (Backward and Forward)’’).	
(4) In section 5–1.3.1 (‘‘Boom Hoist Mechanism’’), paragraphs (a), (b)(1) and (b)(2), except that when using rotation resistant rope, § 1926.1414(c)(4)(ii)(A) applies. (5) In section 5–1.3.2 (‘‘Load Hoist Mechanism’’), paragraphs (a)(2) through (a)(4) (including subparagraphs), (b) (including subparagraphs), (c) (first sentence only) and (d). (6) Section 5–1.3.3 (‘‘Telescoping Boom’’). (7) Section 5–1.4 (‘‘Swing Mechanism’’). (8) In section 5–1.5 (‘‘Crane Travel’’), all provisions except 5–1.5.3(d). (9) In section 5–1.6 (‘‘Controls’’), all provisions except 5–1.6.1 (c). (10) Section 5–1.7.4 (‘‘Sheaves’’). (11) Section 5–1.7.5 (‘‘Sheave sizes’’). (12) In section 5–1.9.1 (‘‘Booms’’), paragraph (f). (13) Section 5–1.9.3 (‘‘Outriggers’’). (14) Section 5–1.9.4 (‘‘Locomotive Crane Equipment’’). (15) Section 5–1.9.7 (‘‘Clutch and Brake Protection’’). (16) In section 5–1.9.11 (‘‘Miscellaneous equipment’’), paragraphs (a), (c), (e), and (f).	(4) In section 5-1.3.1 (‘‘Boom Hoist Mechanism’’), paragraphs (a), (b)(1) and (b)(2), except that when using rotation resistant rope, Section 1614(e)(4)(B)1 applies. (5) In section 5-1.3.2 (‘‘Load Hoist Mechanism’’), paragraphs (a)(2) through (a)(4) (including subparagraphs), (b) (including subparagraphs), (c) (first sentence only) and (d). (6) Section 5-1.3.3 (‘‘Telescoping Boom’’). (7) Section 5-1.4 (‘‘Swing Mechanism’’). (8) In section 5-1.5 (‘‘Crane Travel’’), all provisions except 5-1.5.3(d). (9) In section 5-1.6 (‘‘Controls’’), all provisions except 5-1.6.1 (c). (10) Section 5-1.7.4 (‘‘Sheaves’’). (11) Section 5-1.7.5 (‘‘Sheave sizes’’). (12) In section 5-1.9.1 (‘‘Booms’’), paragraph (f). (13) Section 5-1.9.3 (‘‘Outriggers’’). (14) Section 5-1.9.4 (‘‘Locomotive Crane Equipment’’). (15) Section 5-1.9.7 (‘‘Clutch and Brake Protection’’). (16) In section 5-1.9.11 (‘‘Miscellaneous equipment’’), paragraphs (a), (c), (e), and (f).	Typo at federal (b)(4) – should read “§1926.1414(e)(4)(ii)(A) applies”
(c) Prototype testing: mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the	(c) Prototype testing: Cranes manufactured on or after November 8, 2010 shall meet the prototype testing requirements prescribed in 29	Since any cranes manufactured in California are extremely likely to be used in interstate commerce, California proposes to reference

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	CFR 1926.1433(c).	federal standards for prototype testing.
(1) Test Option A. (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): All the tests listed in SAE J1063 (Nov. 1993) Table 1 (incorporated by reference, see § 1926.6) must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J1063 (Nov. 1993) Table 2 (incorporated by reference, see § 1926.6) must be met. (ii) The following applies to equipment with pendant supported lattice booms: All the tests listed in SAE J987 (Jun. 2003) Table 1 (incorporated by reference, see § 1926.6) must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J987 (Jun. 2003) Table 2 (incorporated by reference, see § 1926.6) must be met.		
(2) Test Option B. The testing and verification requirements of BS EN 13000:2004 (incorporated by reference, see § 1926.6) must be met. In applying BS EN 13000:2004, the following additional requirements must be met:		

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J1063 (Nov. 1993) (incorporated by reference, see § 1926.6) meet the strength margins listed in SAE J1063 (Nov. 1993) Table 2. (ii) The following applies to equipment with pendant supported lattice booms: The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J987 (Jun. 2003) (incorporated by reference, see § 1926.6) meet the strength margins listed in SAE J987 (Jun. 2003) Table 2. (iii) Analysis verification. The physical testing requirements under SAE J1063 (Nov. 1993) (incorporated by reference, see § 1926.6) and SAE J987 (Jun. 2003) (incorporated by reference, see § 1926.6) must be met unless the reliability of the analysis methodology (computer modeling) has been demonstrated by a documented history of verification through strain gauge measuring or strain gauge measuring in combination with other physical testing.		
(d) All equipment covered by this subpart must meet the following requirements: (1) Rated capacity and related information. The information available in the cab (see § 1926.1417(c)) regarding ‘‘rated capacity’’ and related information must include, at a minimum, the following information: (i) A complete range of the manufacturer’s	(d) All equipment covered by this Article shall meet the following requirements: (1) Rated capacity and related information. The information available in the cab [see Section 1616.1(c)] regarding “rated capacity” and related information shall include, at a minimum, the following information: (A) A complete range of the manufacturer’s	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
equipment rated capacities, as follows: (A) At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset). (B) Alternate ratings for use and nonuse of option equipment which affects rated capacities, such as outriggers, stabilizers, and extra counterweights. (ii) A work area chart for which capacities are listed in the load chart. (Note: An example of this type of chart is in ASME B30.5–2004, section 5–1.1.3, Figure 11). (iii) The work area figure and load chart must clearly indicate the areas where no load is to be handled. (iv) Recommended reeving for the hoist lines must be shown. (v) Recommended parts of hoist reeving, size, and type of wire rope for various equipment loads. (vi) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope. (vii) Tire pressure (where applicable). (viii) Caution or warnings relative to limitations on equipment and operating procedures, including an indication of the least stable direction. (ix) Position of the gantry and requirements for intermediate boom suspension (where applicable). (x) Instructions for boom erection and	equipment rated capacities, as follows: 1. At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset). 2. Alternate ratings for use and nonuse of option equipment which affects rated capacities, such as outriggers, stabilizers, and extra counterweights. (B) A work area chart for which capacities are listed in the load chart. (Note: An example of this type of chart is in ASME B30.5–2004, section 5-1.1.3, Figure 11). (C) The work area figure and load chart shall clearly indicate the areas where no load is to be handled. (D) Recommended reeving for the hoist lines shall be shown. (E) Recommended parts of hoist reeving, size, and type of wire rope for various equipment loads. (F) Recommended boom hoist reeving diagram, where applicable; size, type and length of wire rope. (G) Tire pressure (where applicable). (H) Caution or warnings relative to limitations on equipment and operating procedures, including an indication of the least stable direction. (I) Position of the gantry and requirements for intermediate boom suspension (where applicable). (J) Instructions for boom erection and	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
conditions under which the boom, or boom and jib combinations, may be raised or lowered. (xi) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (xii) The maximum telescopic travel length of each boom telescopic section. (xiii) Whether sections are telescoped manually or with power. (xiv) The sequence and procedure for extending and retracting the telescopic boom section. (xv) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (xvi) Hydraulic relief valve settings specified by the manufacturer.	conditions under which the boom, or boom and jib combinations, may be raised or lowered. (K) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (L) The maximum telescopic travel length of each boom telescopic section. (M) Whether sections are telescoped manually or with power. (N) The sequence and procedure for extending and retracting the telescopic boom section. (O) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (P) Hydraulic relief valve settings specified by the manufacturer.	
(2) Load hooks (including latched and unlatched types), ball assemblies and load blocks must be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use. (3) Hook and ball assemblies and load blocks must be marked with their rated capacity and weight. (4) Latching hooks. (i) Hooks must be equipped with latches, except where the requirements of paragraph (d)(4)(ii) of this section are met. (ii) Hooks without latches, or with latches removed or disabled, must not be used unless: (A) A qualified person has determined that it is safer to hoist and place the load without latches	(2) Load hooks (including latched and unlatched types), ball assemblies and load blocks shall be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use. (3) Hook and ball assemblies and load blocks shall be marked with their rated capacity and weight. (4) Latching hooks. (A) Hooks shall be equipped with latches, except where the requirements of subsection (d)(4)(B) of this section are met. (B) Hooks without latches, or with latches removed or disabled, must not be used unless: 1. A qualified person has determined that it is safer to hoist and place the load without latches	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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. (iii) The latch must close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.	(or with the latches removed/tied-back). 2. 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. (C) The latch must close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.	
(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. (6) An accessible fire extinguisher must be on the equipment.	(5) Posted warnings. Posted warnings required by this Article as well as those originally supplied with the equipment by the manufacturer shall be maintained in legible condition. (6) An accessible fire extinguisher shall be on the equipment.	
(7) Cabs. Equipment with cabs must meet the following requirements: (i) Cabs must be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper. (ii) Cab doors (swinging, sliding) must be designed to prevent inadvertent opening or closing while traveling or operating the machine. Swinging doors adjacent to the operator must open outward. Sliding operator doors must open rearward.	(7) Cabs. Equipment with cabs shall meet the following requirements: (A) Cabs shall be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper. (B) Cab doors (swinging, sliding) shall be designed to prevent inadvertent opening or closing while traveling or operating the machine. Swinging doors adjacent to the operator shall open outward. Sliding operator doors shall open rearward.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(iii) Windows. (A) The cab must have windows in front and on both sides of the operator. Forward vertical visibility must be sufficient to give the operator a view of the boom point at all times. (B) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened must be designed so that they can be secured to prevent inadvertent closure. (C) Windows must be of safety glass or material with similar optical and safety properties, that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment. (iv) A clear passageway must be provided from the operator's station to an exit door on the operator's side. (v) Areas of the cab roof that serve as a workstation for rigging, maintenance or other equipment-related tasks must be capable of supporting 250 pounds without permanent distortion.	(C) Windows. 1. 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. 2. Windows shall 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. 3. Windows shall be of safety glass or material with similar optical and safety properties, that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment. (D) A clear passageway shall be provided from the operator's station to an exit door on the operator's side. (E) Areas of the cab roof that serve as a workstation for rigging, maintenance or other equipment-related tasks shall be capable of supporting 250 pounds without permanent distortion.	
(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. (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	(8) Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, and other parts or components that reciprocate, rotate or otherwise move shall be guarded where contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties. (9) All exhaust pipes, turbochargers, and charge air coolers shall be insulated or guarded where contact by employees (except for maintenance and repair employees) is possible in the	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
performance of normal duties. (10) Hydraulic and pneumatic lines must be protected from damage to the extent feasible. (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. (12) Friction mechanisms. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they must be: (i) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving. (ii) Adjustable to permit compensation for lining wear to maintain proper operation. (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.	performance of normal duties. (10) Hydraulic and pneumatic lines shall be protected from damage to the extent feasible. (11) The equipment shall be designed so that exhaust fumes are not discharged in the cab and are discharged in a direction away from the operator. (12) Friction mechanisms. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they shall be: (A) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving. (B) Adjustable to permit compensation for lining wear to maintain proper operation. (13) Hydraulic load hoists. Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent load hoist movement in the event of hydraulic failure.	
(e) The employer's obligations under paragraphs (a) through (c) and (d)(7) through (13) of this section are met where the equipment has not changed (except in accordance with § 1926.1434 (Equipment modifications)) and it can refer to documentation from the manufacturer showing that the equipment has been designed, constructed and tested in accordance with those paragraphs.	(e) The employer's obligations under subsections (a) through (c) and (d)(7) through (13) of this section are met where the equipment has not changed (except in accordance with Section 1610.6 (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 subsections.	
§ 1926.1434 Equipment modifications.	§1610.6. Equipment modifications.	
(a) Modifications or additions which affect the	(a) Modifications or additions which affect the	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
capacity or safe operation of the equipment are prohibited except where the requirements of paragraphs (a)(1), (a)(2), (a)(3), (a)(4), or (a)(5) of this section are met. (1) Manufacturer review and approval. (i) The manufacturer approves the modifications/additions in writing. (ii) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition. (iii) The original safety factor of the equipment is not reduced.	capacity or safe operation of the equipment are prohibited except where the requirements of subsections (a)(1), (a)(2), (a)(3), (a)(4), or (a)(5) of this section are met. (1) Manufacturer review and approval. (A) The manufacturer approves the modifications/additions in writing. (B) The load charts, procedures, instruction manuals and instruction plates/tags/decals are modified as necessary to accord with the modification/addition. (C) The original safety factor of the equipment is not reduced.	
(2) Manufacturer refusal to review request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met: (i) A registered professional engineer who is a qualified person with respect to the equipment involved: (A) Approves the modification/addition and specifies the equipment configurations to which that approval applies, and (B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/ decals as necessary to accord with the modification/addition. (ii) The original safety factor of the equipment is not reduced.	(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: (A) A registered professional engineer who is a qualified person with respect to the equipment involved: 1. Approves the modification/addition and specifies the equipment configurations to which that approval applies, and 2. Modifies load charts, procedures, instruction manuals and instruction plates/tags/ decals as necessary to accord with the modification/ addition. (B) The original safety factor of the equipment is not reduced.	
(3) Unavailable manufacturer. The	(3) Unavailable manufacturer. The	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
manufacturer is unavailable and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	manufacturer is unavailable and the requirements of subsections (a)(2)(A) and (B) of this section are met.	
(4) Manufacturer does not complete the review within 120 days of the request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	(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 subsections (a)(2)(A) and (B) of this section are met.	
(5) Multiple manufacturers of equipment designed for use on marine work sites. The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	(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 subsections (a)(2)(A) and (B) of this section are met.	
(b) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing, the employer may treat this as a manufacturer refusal to review the request under paragraph (a)(2) of this section.	(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 subsection (a)(2) of this section.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(c) The provisions in paragraphs (a) and (b) of this section do not apply to modifications made or approved by the U.S. military.		The California Occupational Safety and Health program does not have jurisdiction over the U.S. Military.
§ 1926.1435 Tower cranes.	§1619.1. Tower cranes.	
(a) This section contains supplemental requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise.	(a) This section contains supplemental requirements for tower cranes; all sections of this Article 15 apply to tower cranes unless specified otherwise.	Fed verbiage.
(b) Erecting, climbing and dismantling.	(b) Erecting, climbing and dismantling. The erection, climbing (up and down) and dismantling of a fixed tower crane shall comply with the requirements of Title 8, Section 341.1(b)(2) and General Industry Safety Orders, Section 4966. In addition the following supplemental requirements are applicable for all tower cranes.	GISO 4966(a) modified to accommodate federal verbiage.
(1) Section 1926.1403 (Assembly/ Disassembly—selection of manufacturer or employer procedures), § 1926.1404 (Assembly/ Disassembly—general requirements (applies to all assembly and disassembly operations)), § 1926.1405 (Disassembly—additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)), and § 1926.1406 (Assembly/Disassembly—employer procedures—general requirements), apply to tower cranes (except as otherwise specified), except that the term ‘‘assembly/disassembly’’ is replaced by ‘‘erecting, climbing and dismantling,’’ and the term ‘‘disassembly’’ is replaced by ‘‘dismantling.’’	(1) Section 1611.1 (Assembly/ Disassembly – selection of manufacturer or employer procedures), Section 1611.2 (Assembly/ Disassembly – general requirements (applies to all assembly and disassembly operations)), Section 1611.3 (Disassembly – additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)), and Section 1611.4 (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.”	Fed verbiage.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.	(2) Dangerous areas (self-erecting tower cranes). In addition to the requirements in Section 1611.2(e), for self-erecting tower cranes, the following applies: Employees shall not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling 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.	Fed verbiage.
(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.	(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) shall be designed by the manufacturer or a certified agent.	Fed verbiage amended with CA terminology for RPE.
(4) Addressing specific hazards. The requirements in § 1926.1404(h)(1) through (9) apply. In addition, the A/D director must address the following: (i) Foundations and structural supports. The A/D director must determine that tower crane foundations and structural supports are installed in accordance with their design. (ii) Loss of backward stability. Backward stability before swinging self-erecting cranes or cranes on traveling or static undercarriages. (iii) Wind speed. Wind must not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.	(4) Addressing specific hazards. The requirements in Section 1611.2(h)(1) through (9) apply. In addition, the A/D director shall address the following: (A) Foundations and structural supports. The A/D director shall determine that tower crane foundations and structural supports are installed in accordance with their design. (B) Loss of backward stability. Backward stability before swinging self-erecting cranes or cranes on traveling or static undercarriages. (C) 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.	Fed verbiage.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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). (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.	(5) Plumb tolerance. Towers shall be erected plumb to the manufacturer's tolerance and verified by a qualified person. Where the manufacturer does not specify plumb tolerance, the crane tower shall be plumb to a tolerance of at least 1:500 (approximately 1 inch in 40 feet). (6) Multiple tower crane jobsites. On jobsites where more than one fixed jib (hammerhead) tower crane is installed, the cranes shall be located such that no crane can come in contact with the structure of another crane. Cranes are permitted to pass over one another.	Fed verbiage.
(7) Climbing procedures. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer must: (i) Comply with all manufacturer prohibitions. (ii) Have a registered professional engineer verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors.	(7) Climbing procedures. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer shall: (A) Comply with all manufacturer prohibitions. (B) Have a certified agent verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors.	Fed verbiage.
(8) Counterweight/ballast. (i) Equipment must not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a registered professional engineer familiar with the equipment. (ii) The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment must not be exceeded.	(8) Counterweight/ballast. (A) Equipment shall not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a certified agent familiar with the equipment. (B) The maximum counterweight and/or ballast specified by the manufacturer or certified agent familiar with the equipment shall not be exceeded.	Fed verbiage amended with CA terminology for RPE.
(c) Signs. The size and location of signs installed on tower cranes must be in accordance with manufacturer specifications. Where these	(c) Signs. The size and location of signs installed on tower cranes shall be in accordance with manufacturer specifications. Where these	Fed verbiage amended with CA terminology for RPE.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
are unavailable, a registered professional engineer familiar with the type of equipment involved must approve in writing the size and location of any signs.	are unavailable, a certified agent familiar with the type of equipment involved shall approve in writing the size and location of any signs.	
(d) Safety devices. (1) Section 1926.1415 does not apply to tower cranes. (2) The following safety devices are required on all tower cranes unless otherwise specified: (i) Boom stops on luffing boom type tower cranes. (ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment. (iii) Travel rail end stops at both ends of travel rail. (iv) Travel rail clamps on all travel bogies. (v) Integrally mounted check valves on all load supporting hydraulic cylinders. (vi) Hydraulic system pressure limiting device. (vii) The following brakes, which must automatically set in the event of pressure loss or power failure, are required: (A) A hoist brake on all hoists. (B) Swing brake. (C) Trolley brake. (D) Rail travel brake. (viii) Deadman control or forced neutral return control (hand) levers. (ix) Emergency stop switch at the operator's station. (x) Trolley end stops must be provided at both ends of travel of the trolley.	(d) Safety devices. (1) Section 1615.1 does not apply to tower cranes. (2) The following safety devices are required on all tower cranes unless otherwise specified: (A) Boom stops on luffing boom type tower cranes. (B) Jib stops on luffing boom type tower cranes if equipped with a jib attachment. (C) Travel rail end stops at both ends of travel rail. (D) Travel rail clamps on all travel bogies. (E) Integrally mounted check valves on all load supporting hydraulic cylinders. (F) Hydraulic system pressure limiting device. (G) The following brakes, which shall automatically set in the event of pressure loss or power failure, are required: 1. A hoist brake on all hoists. 2. Swing brake. 3. Trolley brake. 4. Rail travel brake. (H) Deadman control or forced neutral return control (hand) levers. (I) Emergency stop switch at the operator's station. (J) Trolley end stops shall be provided at both ends of travel of the trolley.	Fed verbiage.
(3) Proper operation required. Operations must not begin unless the devices	(3) Proper operation required. Operations shall not begin unless the devices	Fed verbiage.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	listed in this section 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 Section 1616.1(g). Alternative measures are not permitted to be used.	
(e) Operational aids. (1) Section 1926.1416 does not apply to tower cranes. (2) The devices listed in this section (‘‘operational aids’’) are required on all tower cranes covered by this subpart, unless otherwise specified. (3) Operations 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.	(e) Operational aids. (1) Section 1615.2 does not apply to tower cranes. (2) The devices listed in this section (“operational aids”) are required on all tower cranes covered by this Article, unless otherwise specified. (3) Operations shall not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, shall be followed. See Section 1616.1(j) for additional requirements.	
(4) If an operational aid stops working properly during operations, the operator must safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use of a substitute device that performs the same type of function is permitted and is not considered a modification under § 1926.1434.	(4) If an operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly.	Use of a substitute device is not permitted without Division approval.
(5) Category I operational aids and alternative measures. Operational aids listed in this	(5) Category I operational aids. Operational aids listed in this subsection shall be	All operational aids must be operational prior to and operational at all times. (Required by the

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	operational prior to and during operation at all times.	manufacturer). Alternatives not permitted (GISO Art. 96).
(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) Option A. The trolley rope must be marked (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops. (B) Option B. A spotter who is in direct communication with the operator must be used when operations are conducted within 10 feet of the outer or inner trolley end stops.	(A) 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.	Alternatives not allowed by GISO 4968(e)
(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.	(B) Boom hoist limiting device. The range of the boom shall be limited at the minimum and maximum radius.	Alternatives not allowed by GISO 4968
(iii) Anti two-blocking device. The tower crane	(C) Anti two-blocking device. The tower crane	Alternatives not allowed by GISO 4968(f)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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.	shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage at all points where two-blocking could occur.	
(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.	(D) Hoist drum lower limiting device. Tower cranes manufactured after [Effective date plus 1 year] shall be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum.	Alternatives not allowed by GISO 4968
(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	(E) Load moment limiting device. The tower crane shall have a device that prevents moment overloading.	Alternatives not allowed by GISO 4968

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.		
(vi) Hoist line pull limiting device. The capacity of the hoist must be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission. *Temporary alternative measures:* The operator must ensure that the weight of the load does not exceed the capacity of the hoist (including for each individual gear ratio if equipped with a multiple speed hoist transmission).	(F) Hoist line pull limiting device. The capacity of the hoist shall be limited to prevent overloading, including each individual gear ratio if equipped with a multiple speed hoist transmission.	Alternatives not allowed by GISO 4968
(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.	(G) 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.	Alternatives not allowed by GISO 4968
(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	(H) 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	Equivalent braking system permitted by GISO 4965(f)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
from the cab. Temporary alternative measures: The device must be manually set when required if an electric, hydraulic or automatic control is not functioning.	from the cab. Temporary alternative measure: The device shall be manually set when required if an electric, hydraulic or automatic control is not functioning.	
(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.		No Category II in California (all are Cat I)
(i) Boom angle or hook radius indicator. (A) Luffing boom tower cranes must have a boom angle indicator readable from the operator's station. (B) Hammerhead tower cranes manufactured after November 8, 2011 must have a hook radius indicator readable from the operator's station. (C) Temporary alternative measures: Hook radii or boom angle must be determined by measuring the hook radii or boom angle with a measuring device.	(I) Boom angle or hook radius indicator. 1. Luffing boom tower cranes shall have a boom angle indicator readable from the operator's station. 2. Hammerhead tower cranes manufactured after [Effective date plus one year] shall have a hook radius indicator readable from the operator's station.	Alternatives not allowed by GISO 4968
(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	(J) Trolley travel deceleration device. The trolley speed shall be automatically reduced prior to the trolley reaching the end limit in both directions.	Alternatives not allowed by GISO 4968

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
travel deceleration device is malfunctioning and instructing the operator to take special care to reduce the trolley speed when approaching the trolley end limits.		
(iii) Boom hoist deceleration device. The boom speed must be automatically reduced prior to the boom reaching the minimum or maximum radius limit. *Temporary alternative measure:* The employer must post a notice in the cab of the crane notifying the operator that the boom hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the boom speed when approaching the minimum or maximum radius limits.	(K) Boom hoist deceleration device. The boom speed shall be automatically reduced prior to the boom reaching the minimum or maximum radius limit.	Alternatives not allowed by GISO 4968
(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.	(L) Load hoist deceleration device. The load speed shall be automatically reduced prior to the hoist reaching the upper limit.	Alternatives not allowed by GISO 4965 and 4968
(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	(M) Wind speed indicator. A device shall be provided to display the wind speed and shall be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it shall be mounted at or above the jib level. *Temporary alternative measures:* Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
estimates the wind speed.	estimates the wind speed.	
(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.	(N) Load indicating device. Cranes manufactured after [Effective date plus one year] 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.	Alternatives not allowed by GISO 4965(d)
(f) Inspections. (1) Section 1926.1412 (Inspections) applies to tower cranes, except that the term ''assembly'' is replaced by ''erection.'' Section 1926.1413 (Wire rope—inspection) applies to tower cranes. (2) Pre-erection inspection. Before each crane component is erected, it must be inspected by a qualified person for damage or excessive wear. (i) The qualified person must pay particular attention to components that will be difficult to inspect thoroughly during shift inspections. (ii) If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, that component must not be erected on the crane unless it is repaired and, upon	(f) Inspections. (1) Sections 1613.1-1613.9 (Inspections) apply to tower cranes, except that the term "assembly" is replaced by "erection." Section 1613.10 (Wire rope – Inspection) applies to tower cranes. (2) Pre-erection inspection. Before each crane component is erected, it shall be inspected by a qualified person for damage or excessive wear. (A) The qualified person shall pay particular attention to components that will be difficult to inspect thoroughly during shift inspections. (B) 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	Fed verbiage, except "certified agent" required by GISO 5020.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
reinspection by the qualified person, found to no longer create a safety hazard. (iii) If the qualified person determines that, though not presently a safety hazard, the component needs to be monitored, the employer must ensure that the component is checked in the monthly inspections. Any such determination must be documented, and the documentation must be available to any individual who conducts a monthly inspection.	reinspection by the qualified person, found to no longer create a safety hazard. (C) If the qualified person determines that, though not presently a safety hazard, the component 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 to any individual who conducts a monthly inspection.	
(3) Post-erection inspection. In addition to the requirements in § 1926.1412(c), the following requirements must be met: (i) A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, must be conducted after each erection. (ii) The load test must be conducted in accordance with the manufacturer's instructions when available. Where these instructions are unavailable, the test must be conducted in accordance with written load test procedures developed by a registered professional engineer familiar with the type of equipment involved.	(3) Post-erection inspection. In addition to the requirements in Section 1613.3, the following requirements shall be met: (A) 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. (B) The load test shall be conducted in accordance with General Industry Safety Orders, Section 5022 and the manufacturer's instructions when available. Where the manufacturer's instructions are unavailable, other methods of proof load testing may be substituted for the above where acceptable to the Division.	Added reference to GISO 5022 (which covers proof load testing in depth) to fed verbiage. "Other test methods" subject to approval by the Division is per GISO 5020(c).
(4) Monthly. The following additional items must be included: (i) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (ii) The upper-most tie-in, braces, floor supports and floor wedges where the tower	(4) Monthly. The following additional items shall be included: (A) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (B) The upper-most tie-in, braces, floor supports and floor wedges where the tower	Fed verbiage.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
crane is supported by the structure, for loose or dislodged components. (5) Annual. In addition to the items that must be inspected under § 1926.1412(f), all turntable and tower bolts must be inspected for proper condition and torque.	crane is supported by the structure, for loose or dislodged components. (5) Annual. In addition to the items that shall be inspected under Section 1613.6, all turntable and tower bolts shall be inspected for proper condition and torque.	
§ 1926.1436 Derricks.	§1619.2. Derricks.	
(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) This section contains supplemental requirements for derricks, whether temporarily or permanently mounted; all sections of this Article 15 apply to derricks unless specified otherwise.	Fed verbiage.
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 basemounted) and operating ropes. Derricks include: A-frame, basket, breast, Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shear leg, stiff leg, and variations of such equipment.	§1610.3. Definitions. Derrick. An apparatus consisting of a mast or equivalent member held at the top by guys or braces, with or without a boom, for use with a hoisting mechanism and operating rope, for lifting or lowering a load and moving it horizontally. (A) A-Frame Derrick. A derrick in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and joined at the top; the boom point secured to the junction of the side members, and the side members are braced or guyed from this junction point. (B) Breast Derrick. A derrick without a boom. The mast consists of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members. The mast is prevented from tipping forward by guys connected to its top. The load is raised and lowered by ropes through a sheave or block	Derricks are defined in 1610.3.

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	secured to the top crosspiece. (C) Gin Pole Derrick. A derrick without a boom. Its guys are so arranged from its top to permit leaning the mast in any direction. The load is raised and lowered by ropes reeved through sheaves or blocks at the top of the mast. (D) Guy Derrick. A fixed derrick consisting of a mast capable of being rotated, supported in a vertical position by guys, and a boom whose bottom end is hinged or pivoted to move in a vertical plane with a reeved rope between the head of the mast and the boom point for raising and lowering the boom, and a reeved rope from the boom point for raising and lowering the load. (E) Stiffleg Derrick. A derrick similar to a guy derrick except that the mast is supported or held in place by two or more stiff members, called stifflegs, which are capable of resisting either tensile or compressive forces. Sills are generally provided to connect the lower ends of the stifflegs to the foot of the mast. (F) Shearleg Derrick. A derrick without a boom and similar to a breast derrick. The mast, wide at the bottom and narrow at the top, is hinged at the bottom and has its top secured by a multiple reeved guy to permit handling loads at various radii by means of load tackle suspended from the mast top.	
(b) Operation—procedures. (1) Section 1926.1417 (Operation) applies except for § 1926.1417(c) (Accessibility of procedures).	1619.2(b) Operation – Procedures. (1) Section 1616.1 (Operation) applies except for Section 1616.1(c) (Accessibility of procedures).	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) Load chart contents. Load charts must contain at least the following information: (i) Rated capacity at corresponding ranges of boom angle or operating radii. (ii) Specific lengths of components to which the rated capacities apply. (iii) Required parts for hoist reeving. (iv) Size and construction of rope must be included on the load chart or in the operating manual. (3) Load chart location. (i) Permanent installations. For permanently installed derricks with fixed lengths of boom, guy, and mast, a load chart must be posted where it is visible to personnel responsible for the operation of the equipment. (ii) Non-permanent installations. For derricks that are not permanently installed, the load chart must be readily available at the job site to personnel responsible for the operation of the equipment.	(2) Load chart contents. Load charts shall contain at least the following information: (A) Rated capacity at corresponding ranges of boom angle or operating radii. (B) Specific lengths of components to which the rated capacities apply. (C) Required parts for hoist reeving. (D) Size and construction of rope shall be included on the load chart or in the operating manual. (3) Load chart location. (A) Permanent installations. For permanently installed derricks with fixed lengths of boom, guy, and mast, a load chart shall be posted where it is visible to personnel responsible for the operation of the equipment. (B) Non-permanent installations. For derricks that are not permanently installed, the load chart shall be readily available at the job site to personnel responsible for the operation of the equipment.	
(c) Construction. (1) General requirements. (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 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).	(c) Construction. (1) General requirements. (A) Derricks shall 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. (B) Welding of load sustaining members shall conform to recommended practices in ANSI/AWS D14.3–94 (incorporated by reference) or AWS D1.1/D1.1M:2002 (incorporated by reference).	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) Guy derricks. (i) The minimum number of guys must be 6, with equal spacing, except where a qualified person or derrick manufacturer approves variations from these requirements and revises the rated capacity to compensate for such variations. (ii) Guy derricks must not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (A) The number of guys. (B) The spacing around the mast. (C) The size, grade, and construction of rope to be used for each guy. (iii) For guy derricks manufactured after December 18, 1970, in addition to the information required in paragraph (c)(2)(ii) of this section, the employer must have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (A) The amount of initial sag or tension. (B) The amount of tension in guy line rope at anchor. (iv) The mast base must permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (v) The mast cap must: (A) Permit the mast to rotate freely. (B) Withstand tilting and cramping caused by the guy loads. (C) Be secured to the mast to prevent disengagement during erection.	(2) Guy derricks. (A) 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. (B) 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: 1. The number of guys. 2. The spacing around the mast. 3. The size, grade, and construction of rope to be used for each guy. (C) For guy derricks manufactured after December 18, 1970, in addition to the information required in subsection (c)(2)(B) of this section, the employer shall have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: 1. The amount of initial sag or tension. 2. The amount of tension in guy line rope at anchor. (D) The mast base shall permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (E) The mast cap shall: 1. Permit the mast to rotate freely. 2. Withstand tilting and cramping caused by the guy loads. 3. Be secured to the mast to prevent disengagement during erection.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(D) Be provided with means for attaching guy ropes.	4. Be provided with means for attaching guy ropes.	
(3) Stiffleg derricks. (i) The mast must be supported in the vertical position by at least two stifflegs; one end of each must be connected to the top of the mast and the other end securely anchored. (ii) The stifflegs must be capable of withstanding the loads imposed at any point of operation within the load chart range. (iii) The mast base must: (A) Permit the mast to rotate freely (when necessary). (B) Permit deflection of the mast without binding. (iv) The mast must be prevented from lifting out of its socket when the mast is in tension. (v) The stiffleg connecting member at the top of the mast must: (A) Permit the mast to rotate freely (when necessary). (B) Withstand the loads imposed by the action of the stifflegs. (C) Be secured so as to oppose separating forces.	(3) Stiffleg derricks. (A) The mast shall be supported in the vertical position by at least two stifflegs; one end of each shall be connected to the top of the mast and the other end securely anchored. (B) The stifflegs shall be capable of withstanding the loads imposed at any point of operation within the load chart range. (C) The mast base shall: 1. Permit the mast to rotate freely (when necessary). 2. Permit deflection of the mast without binding. (D) The mast shall be prevented from lifting out of its socket when the mast is in tension. (E) The stiffleg connecting member at the top of the mast shall: 1. Permit the mast to rotate freely (when necessary). 2. Withstand the loads imposed by the action of the stifflegs. 3. Be secured so as to oppose separating forces.	
(4) Gin pole derricks. (i) Guy lines must be sized and spaced so as to make the gin pole stable in both boomed and vertical positions. Exception: Where the size and/or spacing of guy lines do not result in the gin pole being stable in both boomed and vertical positions, the employer must ensure that the derrick is not used in an unstable position.	(4) Gin pole derricks. (A) Guy lines shall be sized and spaced so as to make the gin pole stable in both boomed and vertical positions. Exception: Where the size and/or spacing of guy lines do not result in the gin pole being stable in both boomed and vertical positions, the employer shall ensure that the derrick is not used in an unstable position.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(ii) The base of the gin pole must permit movement of the pole (when necessary). (iii) The gin pole must be anchored at the base against horizontal forces (when such forces are present).	(B) The base of the gin pole shall permit movement of the pole (when necessary). (C) The gin pole shall be anchored at the base against horizontal forces (when such forces are present).	
(5) Chicago boom derricks. The fittings for stepping the boom and for attaching the topping lift must be arranged to: (i) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (ii) Accommodate attachment to the upright member of the host structure. (iii) Withstand the forces applied when configured and operated in accordance with the manufacturer's/builder's procedures and within its rated capacity. (iv) Prevent the boom or topping lift from lifting out under tensile forces.	(5) Chicago boom derricks. The fittings for stepping the boom and for attaching the topping lift shall be arranged to: (A) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (B) Accommodate attachment to the upright member of the host structure. (C) Withstand the forces applied when configured and operated in accordance with the manufacturer's/builder's procedures and within its rated capacity. (D) Prevent the boom or topping lift from lifting out under tensile forces.	
(d) Anchoring and guying. (1) Load anchoring data developed by the manufacturer or a qualified person must be used. (2) Guy derricks. (i) The mast base must be anchored. (ii) The guys must be secured to the ground or other firm anchorage. (iii) The anchorage and guying must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular guy slope and spacing specified for the application. (3) Stiffleg derricks. (i) The mast base and stifflegs must be	(d) Anchoring and guying. (1) Load anchoring data developed by the manufacturer or a qualified person shall be used. (2) Guy derricks. (A) The mast base shall be anchored. (B) The guys shall be secured to the ground or other firm anchorage. (C) The anchorage and guying shall be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular guy slope and spacing specified for the application. (3) Stiffleg derricks. (A) The mast base and stifflegs shall be	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
anchored. (ii) The mast base and stifflegs must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular stiffleg spacing and slope specified for the application.	anchored. (B) 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.	
(e) Swingers and hoists. (1) The boom, swinger mechanisms and hoists must be suitable for the derrick work intended and must be anchored to prevent displacement from the imposed loads. (2) Hoists. (i) Base mounted drum hoists must meet the requirements in the following sections of ASME B30.7–2001 (incorporated by reference, see § 1926.6): (A) Sections 7–1.1 (‘‘Load ratings and markings’’). (B) Section 7–1.2 (‘‘Construction’’), except: 7–1.2.13 (‘‘Operator’s cab’’); 7–1.2.15 (‘‘Fire extinguishers’’). (C) Section 7–1.3 (‘‘Installation’’). (D) Applicable terms in section 7–0.2 (‘‘Definitions’’). (ii) Load tests for new hoists. The employer must ensure that new hoists are load tested to a minimum of 110% of rated capacity, but not more than 125% of rated capacity, unless otherwise recommended by the manufacturer. This requirement is met where the manufacturer has conducted this testing. (iii) Repaired or modified hoists. Hoists that have had repairs, modifications or additions	(e) Swingers and hoists. (1) The boom, swinger mechanisms and hoists shall be suitable for the derrick work intended and shall be anchored to prevent displacement from the imposed loads. (2) Hoists. (A) Base mounted drum hoists shall meet the requirements in the following sections of ASME B30.7–2001 (incorporated by reference): 1. Sections 7–1.1 (“Load ratings and markings”). 2. Section 7–1.2 (“Construction”), except: 7–1.2.13 (“Operator’s cab”); 7–1.2.15 (“Fire extinguishers”). 3. Section 7–1.3 (“Installation”). 4. Applicable terms in section 7–0.2 (“Definitions”). (B) Load tests for new hoists. The employer shall ensure that new hoists are load tested to a minimum of 110% of rated capacity, but not more than 125% of rated capacity, unless otherwise recommended by the manufacturer. This requirement is met where the manufacturer has conducted this testing. (C) Repaired or modified hoists. Hoists that have had repairs, modifications or additions	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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 paragraphs (e)(2)(ii) or (e)(2)(iii) of this section must be conducted as follows: (A) The test load must be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s). (B) The test load must be lowered, stopped and held with the brake(s). (C) The hoist must not be used unless a competent person determines that the test has been passed.	affecting their capacity or safe operation shall be evaluated by a qualified person to determine if a load test is necessary. If it is, load testing shall be conducted in accordance with subsections (e)(2)(B) and (D) of this section. (D) Load test procedure. Load tests required by subsections (e)(2)(B) or (e)(2)(C) of this section shall be conducted as follows: 1. The test load shall be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s). 2. The test load shall be lowered, stopped and held with the brake(s). 3. The hoist shall not be used unless a competent person determines that the test has been passed.	
(f) Operational aids. (1) Section 1926.1416 (Operational aids) applies, except for § 1926.1416(d)(1) (Boom hoist limiting device), § 1926.1416(e)(1) (Boom angle or radius indicator), and § 1926.1416(e)(4) (Load weighing and similar devices). (2) Boom angle aid. A boom angle indicator is not required but if the derrick is not equipped with a functioning one, the employer must ensure that either: (i) The boom hoist cable must be marked with caution and stop marks. The stop marks must correspond to maximum and minimum allowable boom angles. The caution and stop marks must be in view of the operator, or a spotter who is in direct communication with the operator; or	(f) Operational aids. (1) Section 1615.2 (Operational aids) applies, except for Section 1615.2(d)(1) (Boom hoist limiting device), Section 1615.2(e)(1) (Boom angle or radius indicator), and Section 1615.2(e)(4) (Load weighing and similar devices). (2) Boom angle aid. A boom angle indicator is not required but if the derrick is not equipped with a functioning one, the employer shall ensure that either: (A) The boom hoist cable shall be marked with caution and stop marks. The stop marks shall correspond to maximum and minimum allowable boom angles. The caution and stop marks shall be in view of the operator, or a spotter who is in direct communication with the operator; or	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(ii) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement, is used. (3) Load weight/capacity devices. (i) Derricks manufactured more than one year after 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/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.	(B) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement, is used. (3) Load weight/capacity devices. (A) Derricks manufactured more than one year after [Effective date] with a maximum rated capacity over 6,000 pounds shall have at least one of the following: load weighing device, load moment indicator, rated capacity indicator, or rated 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 Section 1616.1(j) for additional requirements. (B) A load weight/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.	
(g) Post-assembly approval and testing—new or reinstalled derricks.	(g) Post-assembly approval and testing – new or reinstalled derricks.	Certified agent required per GISO 5020

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) Anchorages. (i) Anchorages, including the structure to which the derrick is attached (if applicable), must be approved by a qualified person. (ii) If using a rock or hairpin anchorage, the qualified person must determine if any special testing of the anchorage is needed. If so, it must be tested accordingly. (2) Functional test. Prior to initial use, new or reinstalled derricks must be tested by a competent person with no hook load to verify proper operation. This test must include: (i) Lifting and lowering the hook(s) through the full range of hook travel. (ii) Raising and lowering the boom through the full range of boom travel. (iii) Swinging in each direction through the full range of swing. (iv) Actuating the anti two-block and boom hoist limit devices (if provided). (v) Actuating locking, limiting and indicating devices (if provided).	(1) Anchorages. (A) Anchorages, including the structure to which the derrick is attached (if applicable), shall be approved by a certificating agency. (B) If using a rock or hairpin anchorage, the certificating agency shall determine if any special testing of the anchorage is needed. If so, it shall be tested accordingly. (2) Functional test. Prior to initial use, new or reinstalled derricks shall be tested by a certificating agency with no hook load to verify proper operation. This test shall include: (A) Lifting and lowering the hook(s) through the full range of hook travel. (B) Raising and lowering the boom through the full range of boom travel. (C) Swinging in each direction through the full range of swing. (D) Actuating the anti two-block and boom hoist limit devices (if provided). (E) Actuating locking, limiting and indicating devices (if provided).	
(3) Load test. Prior to initial use, new or reinstalled derricks must be load tested by a competent person. The test load must meet the following requirements: (i) Test loads must be at least 100% and no more than 110% of the rated capacity, unless otherwise recommended by the manufacturer or qualified person, but in no event must the test load be less than the maximum anticipated load.	(3) Load test. Prior to initial use, new or reinstalled derricks shall be load tested by a certificating agency. The testing shall be done in accordance with the provisions of General Industry Safety Orders, section 5023.	Federal subsection (g)(3) amended to require compliance with GISO 5023 which is more protective.
(ii) The test must consist of: (A) Hoisting the test load a few inches and	(A) The test shall consist of: 1. Hoisting the test load a few inches and	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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. (C) Booming the derrick up and down within the allowable working radius for the test load. (D) Lowering, stopping and holding the load with the brake(s). (iii) The derrick must not be used unless the competent person determines that the test has been passed. (4) Documentation. Tests conducted under this paragraph must be documented. The document must contain the date, test results and the name of the tester. The document must be retained until the derrick is re-tested or dismantled, whichever occurs first. All such documents must be available, during the applicable document retention period, to all persons who conduct inspections in accordance with § 1926.1412.	holding to verify that the load is supported by the derrick and held by the hoist brake(s). 2. Swinging the derrick, if applicable, the full range of its swing, at the maximum allowable working radius for the test load. 3. Booming the derrick up and down within the allowable working radius for the test load. 4. Lowering, stopping and holding the load with the brake(s). (C) The derrick shall not be used unless the certificating agency determines that the test has been passed. (4) Documentation. Tests conducted under this subsection shall be documented. The document shall contain the date, test results and the name of the tester. The document shall be retained until the derrick is re-tested or dismantled, whichever occurs first. All such documents shall be available, during the applicable document retention period, to all persons who conduct inspections in accordance with Sections 1613.1-1613.9.	
(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. (i) [Reserved.]	(h) Load testing repaired or modified derricks. Derricks that have had repairs, modifications or additions affecting the derrick's capacity or safe operation shall be evaluated by a certificating agency to determine if a load test is necessary. If it is, load testing shall be conducted and documented in accordance with subsection (g) of this section. (i) [Reserved.]	
(j) Power failure procedures. If power fails during operations, the derrick operator must safely stop operations. This must include:	(j) Power failure procedures. If power fails during operations, the derrick operator shall safely stop operations. This shall include:	(j)(3) added per GISO 5008(g)

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(1) Setting all brakes or locking devices. (2) Moving all clutch and other power controls to the off position.	(1) Setting all brakes or locking devices. (2) Moving all clutch and other power controls to the off position. (3) If practical, the suspended load shall be landed under brake control.	
(k) Use of winch heads. (1) Ropes must not be handled on a winch head without the knowledge of the operator. (2) While a winch head is being used, the operator must be within reach of the power unit control lever. (l) [Reserved.]	(k) Use of winch heads. (1) Ropes shall not be handled on a winch head without the knowledge of the operator. (2) While a winch head is being used, the operator shall be within reach of the power unit control lever. (l) [Reserved.]	
(m) Securing the boom. (1) When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanisms on the boom hoist must be engaged. (2) When taken out of service for 30 days or more, the boom must be secured by one of the following methods: (i) Laid down. (ii) Secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block. (iii) For guy derricks, lifted to a vertical position and secured to the mast. (iv) For stiffleg derricks, secured against the stiffleg.	(m) Securing the boom. (1) When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanisms on the boom hoist shall be engaged. (2) When taken out of service for 30 days or more, the boom shall be secured by one of the following methods: (A) Laid down. (B) Secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block. (C) For guy derricks, lifted to a vertical position and secured to the mast. (D) For stiffleg derricks, secured against the stiffleg.	
(n) The process of jumping the derrick must be supervised by the A/D director. (o) Derrick operations must be supervised by a competent person. (p) Inspections. In addition to the requirements in § 1926.1412, the following additional items	(n) The process of jumping the derrick shall be supervised by the A/D director. (o) Derrick operations shall be supervised by a competent person. (p) Inspections. In addition to the requirements in Sections 1613.1-1613.9, the following	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
must be included in the inspections: (1) Daily: Guys for proper tension. (2) Annual. (i) Gudgeon pin for cracks, wear, and distortion. (ii) Foundation supports for continued ability to sustain the imposed loads. (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.	additional items shall be included in the inspections: (1) Daily: Guys for proper tension. (2) Annual. (A) Gudgeon pin for cracks, wear, and distortion. (B) Foundation supports for continued ability to sustain the imposed loads. (q) Qualification and Training. The employer shall train each operator of a derrick on the safe operation of equipment the individual will operate. Section 1618.1 (Operator qualification and certification) does not apply.	
§ 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.	§1619.3. Floating Cranes/Derricks and Land Cranes/Derricks on Barges.	
(a) This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation (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.	(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 Article 15 apply to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation, unless specified otherwise. The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river, lake, or sea bed and the barge is fully supported by the jacks.	
(b) General requirements. The requirements in paragraphs (c) through (k) of this section apply to both floating cranes/derricks and land cranes/ derricks on barges, pontoons, vessels or other means of flotation.	(b) General requirements. The requirements in subsections (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.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(c) Work area control. (1) The requirements of § 1926.1424 (Work area control) apply, except for § 1926.1424(a)(2)(ii). (2) The employer must either: (i) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or (ii) Clearly mark the hazard areas by a combination of warning signs (such as, ‘‘Danger—Swing/Crush Zone’’) and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.	(c) Work area control. (1) The requirements of Section 1616.3 (Work area control) apply, except for Section 1616.3(a)(2)(B). (2) The employer shall either: (A) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or (B) 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 shall train each employee to understand what these markings signify.	
(d) Keeping clear of the load. Section 1926.1425 does not apply. (e) Additional safety devices. In addition to the safety devices listed in § 1926.1415, the following safety devices are required: (1) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device must be located in the cab or, when there is no cab, at the operator’s station. (2) Positive equipment house lock. (3) Wind speed and direction indicator. A competent person must determine if wind is a factor that needs to be considered; if wind needs to be considered, a wind speed and direction indicator must be used.	(d) Keeping clear of the load. Section 1616.4 does not apply. (e) Additional safety devices. In addition to the safety devices listed in Section 1615.1, the following safety devices are required: (1) 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. (2) Positive equipment house lock. (3) 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.	
(f) Operational aids. (1) An anti two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft.	(f) Operational aids. (1) An anti two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(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.	(2) Section 1615.2(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.	
(g) Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of § 1926.1417(c) apply. If the crane/derrick does not have a cab, the employer must ensure that: (1) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with pendant-controlled equipment), the load charts are posted on the equipment. (2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, must be readily available on board the vessel/ flotation device.	(g) Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of Section 1616.1(c) apply. If the crane/derrick does not have a cab, the employer shall ensure that: (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. (2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, shall be readily available on board the vessel/flotation device.	
(h) Inspections. In addition to meeting the requirements of § 1926.1412 for inspecting the crane/derrick, the employer must inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane/ derrick or land crane/derrick, and ensure that: (1) Shift. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension.	(h) Inspections. In addition to meeting the requirements of Sections 1613.1-1613.9 for inspecting the crane/derrick, the employer shall inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick, and ensure that: (1) Shift. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(2) Monthly. For each monthly inspection: (i) The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension. (ii) The vessel/flotation device is not taking on water. (iii) The deckload is properly secured. (iv) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (v) The firefighting and lifesaving equipment is in place and functional.	(2) Monthly. For each monthly inspection: (A) 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. (B) The vessel/flotation device is not taking on water. (C) The deck load is properly secured. (D) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (E) The firefighting and lifesaving equipment is in place and functional.	
(3) The shift and monthly inspections are conducted by a competent person, and: (i) If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard. (ii) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.	(3) The shift and monthly inspections are conducted by a qualified person, and: (A) If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard. (B) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.	
(4) Annual: external vessel/flotation device inspection. For each annual inspection: (i) The external portion of the barge, pontoons, vessel or other means of flotation used is inspected annually by a qualified person who has expertise with respect to vessels/flotation devices and that the inspection includes the following items: (A) The items identified in paragraphs (h)(1) (Shift) and (h)(2) (Monthly) of this section.	(4) Annual: external vessel/flotation device inspection. For each annual inspection: (A) 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: 1. The items identified in subsections (h)(1) (Shift) and (h)(2) (Monthly) of this section.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(B) Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items. (C) External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device. (D) Four-corner draft readings. (E) Firefighting equipment for serviceability. (ii) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition. (iii) If any deficiency is identified, an immediate determination is made by the qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections. (A) If the qualified person determines that the deficiency constitutes a hazard, the vessel/ flotation device is removed from service until it has been corrected. See requirements in § 1926.1417(f). (B) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.	2. Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items. 3. 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. 4. Four-corner draft readings. 5. Firefighting equipment for serviceability. (B) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition. (C) 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. 1. 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 Section 1616.1(g). 2. If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.	
(5) 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/	(5) Four-year: internal vessel/flotation device inspection. For each four-year inspection: (A) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation. (ii) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. (A) If the surveyor determines that the deficiency constitutes a hazard, the vessel/ flotation device is removed from service until it has been corrected. (B) If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.	flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation. (B) 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. 1. If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. 2. If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.	
(6) Documentation. The monthly and annual inspections required in paragraphs (h)(2) and (h)(4) of this section 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. (i) [Reserved.]	(6) Documentation. The monthly and annual inspections required in subsections (h)(2) and (h)(4) of this section are documented in accordance with Sections 1613.5(a)(3) and 1613.6(g), respectively, and that the four-year inspection required in subsection (h)(5) of this section is documented in accordance with Section 1613.6(g), except that the documentation for that inspection shall be retained for a minimum of 4 years. All such documents shall be made available, during the applicable document retention period, to all persons who conduct inspections in accordance with Sections 1613.1-1613.9. (i) [Reserved.] (j) [Reserved]	
	Amend GISO Section 6060 to read:	California proposes to amend T8 Section 6060

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
	***	which pertains to commercial diving to address the federal issues shown here.
(j) Working with a diver. The employer must meet the following additional requirements when working with a diver in the water: (1) If a crane/derrick is used to get a diver into and out of the water, it must not be used for any other purpose until the diver is back on board. When used for more than one diver, it must not be used for any other purpose until all divers are back on board. (2) The operator must remain at the controls of the crane/derrick at all times. (3) In addition to the requirements in §§ 1926.1419 through 1926.1422 (Signals), either: (i) A clear line of sight must be maintained between the operator and tender; or (ii) The signals between the operator and tender must be transmitted electronically. (4) The means used to secure the crane/derrick to the vessel/flotation device (see paragraph (n)(5) of this section) must not allow any amount of shifting in any direction.	(b)(4) Working with a diver. The employer shall meet the following additional requirements when working with a diver in the water: (A) If a crane/derrick is used to get a diver into and out of the water, it shall not be used for any other purpose until the diver is back on board. When used for more than one diver, it shall not be used for any other purpose until all divers are back on board. (B) The operator shall remain at the controls of the crane/derrick at all times. (C) In addition to the requirements in CSO Sections 1617.1-1617.3 (Signals), either: 1. A clear line of sight shall be maintained between the operator and tender; or 2. The signals between the operator and tender shall be transmitted electronically. 3. The means used to secure the crane/derrick to the vessel/flotation device [see CSO section 1619.3(n)(5)] shall not allow any amount of shifting in any direction.	
(k) Manufacturer's specifications and limitations. (1) The employer must ensure that the barge, pontoons, vessel, or other means of flotation must be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations. (2) The employer must ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and	(k) Manufacturer's specifications and limitations. (1) 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. (2) The employer shall ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
intransit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (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. (l) [Reserved.]	in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (3) When the manufacturer's specifications and limitations 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. (l) [Reserved.]	
(m) Floating cranes/derricks. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation: (1) Load charts. (i) The employer must not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer must comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts. (ii) The employer must ensure that load charts take into consideration a minimum wind speed of 40 miles per hour. (2) The employer must ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.	(m) Floating cranes/derricks. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation: (1) Load charts. (A) 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. (B) The employer shall ensure that load charts take into consideration a minimum wind speed of 40 miles per hour. (2) The employer shall ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.	
TABLE M1 Rated Capacity | Maximum Allowable List (degrees) | Maximum Allowable Trim (degrees) Equipment designed for	TABLE M1 Rated Capacity | Maximum Allowable List (degrees) | Maximum Allowable Trim (degrees) Equipment designed for	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926

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

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

(4) If the equipment is employer-made, it must not be used unless the employer has documents demonstrating that the load charts and

STATE:

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

(3) The employer shall 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

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High boom, no load	60	2

TABLE M3

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

(4) If the equipment is employer-made, it shall not be used unless the employer has documents demonstrating that the load charts and

RATIONALE

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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).	applicable parameters for use meet the requirements of subsections (m)(1) through (3) of this section. Such documents shall be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).	
(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/derrick when operating at the crane/derrick's maximum rated capacity with all planned and actual deck loads and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect. (iii) Have access to void compartments to allow for inspection and pumping.	(5) The employer shall ensure that the barge, pontoons, vessel or other means of flotation used: (A) 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. (B) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect. (C) Have access to void compartments to allow for inspection and pumping.	
(n) Land cranes/derricks. For land cranes/ derricks used on barges, pontoons, vessels or other means of flotation, the employer must ensure that: (1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (i) Account for increased loading from list, trim, wave action, and wind. (ii) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and	(n) Land cranes/derricks. For land cranes/ derricks used on barges, pontoons, vessels or other means of flotation, the employer shall ensure that: (1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (A) Account for increased loading from list, trim, wave action, and wind. (B) 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
encountered.	encountered.	
(iii) The conditions required in paragraphs (n)(3) and (n)(4) of this section are met.	(C) The conditions required in subsections (n)(3) and (n)(4) of this section are met.	
(2) The rated capacity modification required in paragraph (n)(1) of this section is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices.	(2) The rated capacity modification required in subsection (n)(1) of this section is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices.	
(3) For list and trim.	(3) For list and trim.	
(i) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation must not exceed the amount necessary to ensure that the conditions in paragraph (n)(4) of this section are met. In addition, the maximum allowable list and the 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.	(A) 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 subsection (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/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.	(B) The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.	
(4) For the following conditions:	(4) For the following conditions:	
(i) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water.	(A) 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	(B) The entire bottom area of the barge, pontoons, vessel or other means of flotation	

SOURCE OF FEDERAL OSHA STANDARD(S):_ SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
used is submerged.	used is submerged.	
(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.	(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 subsection (n)(5)(E) of this section.	
(i) Option (1)—Physical attachment. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/ derrick to the vessel/flotation device with chains, or other methods of physical attachment.	(A) Option (1) – Physical attachment. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/ derrick to the vessel/flotation device with chains, or other methods of physical attachment.	
(ii) Option (2)—Corralling. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers must ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.	(B) Option (2) – Corralling. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers shall 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/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.	(C) Option (3) – Rails. The crane/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.	
(iv) Option (4)—Centerline cable system. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The	(D) Option (4) – Centerline cable system. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
employer must ensure that the wire rope system meets the following requirements: (A) The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick. (B) The wire rope is attached physically to the vessel/flotation device. (C) The wire rope is attached to the crane/ derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/ flotation device for repositioning. (D) Means are installed to prevent the crane/ derrick from passing the forward or aft end of the wire rope attachments. (E) The crane/derrick is secured from movement during operation.	employer shall ensure that the wire rope system meets the following requirements: 1. The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick. 2. The wire rope is attached physically to the vessel/flotation device. 3. 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. 4. Means are installed to prevent the crane/ derrick from passing the forward or aft end of the wire rope attachments. 5. The crane/derrick is secured from movement during operation.	
(v) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/ derrick design.	(E) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/ derrick design.	
(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	(6) Exception. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by subsection (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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
following requirements: (i) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane. (ii) The plan is designed so that the applicable requirements of this section are met despite the position, travel, operation, and lack of physical attachment (or corralling, use of rails or cable system) of the mobile auxiliary crane. (iii) The plan specifies the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters and limitations of such movements and operation. (iv) The deck is marked to identify the permitted areas for positioning, travel, and operation. (v) The plan specifies the dynamic and environmental conditions that must be present for use of the plan. (vi) If the dynamic and environmental conditions in paragraph (n)(6)(v) of this section are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of paragraph (n)(5) of this section.	requirements: (A) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane. (B) The plan 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. (C) 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. (D) The deck is marked to identify the permitted areas for positioning, travel, and operation. (E) The plan specifies the dynamic and environmental conditions that must be present for use of the plan. (F) If the dynamic and environmental conditions in subsection (n)(6)(E) of this section are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of subsection (n)(5) of this section.	
(7) The barge, pontoons, vessel or other means of flotation used: (i) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all anticipated deck loads	(7) The barge, pontoons, vessel or other means of flotation used: (A) 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	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
and ballasted compartments. (ii) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (iii) Have access to void compartments to allow for inspection and pumping.	and ballasted compartments. (B) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (C) Have access to void compartments to allow for inspection and pumping.	
§ 1926.1438 Overhead & gantry cranes.	§1619.4. Overhead & gantry cranes.	
(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.	(a) Permanently installed overhead and gantry cranes. The requirements of General Industry Safety Orders, Article 92, apply to the following equipment when used in construction and permanently installed in a facility: overhead and gantry cranes, including semi-gantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics.	
(b) Overhead and gantry cranes that are not permanently installed in a facility. (1) This paragraph applies to the following equipment when used in construction and not permanently installed in a facility: Overhead and gantry cranes, overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment having the same fundamental characteristics, irrespective of whether it travels on tracks, wheels, or other means. (2) The following requirements apply to equipment identified in paragraph (b)(1) of this section:	(b) Overhead and gantry cranes that are not permanently installed in a facility. (1) This subsection applies to the following equipment when used in construction and not permanently installed in a facility: Overhead and gantry cranes, overhead/bridge cranes, semi-gantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment having the same fundamental characteristics, irrespective of whether it travels on tracks, wheels, or other means. (2) The following requirements apply to equipment identified in subsection (b)(1) of this section:	
(i) Sections 1926.1400 through 1926.1414; §§	(A) All sections of this Article 15 apply except	Rather than list the 90% of the sections which

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
1926.1417 through 1926.1425; § 1926.1426(d), §§ 1926.1427 through 1926.1434; § 1926.1437, § 1926.1439, and § 1926.1441.	the following sections: Sections 1615.1, 1615.2, 1616.5(a) through 1616.5(c), 1619.1, 1619.2, and 1619.4.	DO apply, CA proposes to list by exception the 10% that DO NOT apply (easier for stakeholders to understand and apply).
(ii) The following portions of § 1910.179: (A) Paragraphs (b)(5),(6),(7); (e)(1),(3),(5),(6); (f)(1),(4); (g); (h)(1),(3); (k); and (n) of § 1910.179.	(B) The requirements of General Industry Safety Orders, Article 92, Cranes (Except Boom-Type Mobile Cranes).	GISO Article 92 is more inclusive.
(B) The definitions in § 1910.179(a) except for ''hoist'' and ''load.'' For those words, the definitions in § 1926.1401 apply.		Definitions unnecessary for California due to formatting
(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.	(C) Applicable Standards: 1. For equipment identified in Subsection (b)(1) which was manufactured before [Effective date] , the standards prescribed by General Industry Safety Orders, Section 4884 shall apply.	Applicable Standards are covered by GISO 4884 prior to the effective date of this standard. The applicable edition of B30.2 prior to Sept 19, 2001 was the 1967, 1983 or 1996 edition (depending on date of manufacture) v. federal 1967 edition.
(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.''	2. For equipment manufactured on or after [Effective date], the following sections of ASME B30.2-2005 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 applies, except in 2-3.5.1(b), "29 CFR 1910.147" is substituted for "ANSI Z244.1."	CA cannot apply a 2005 standard retroactively.
§ 1926.1439 Dedicated pile drivers.	§1619.5. Dedicated pile drivers.	
(a) The provisions of subpart CC apply to dedicated pile drivers, except as specified in this section. (b) Section 1926.1416(d)(3) (Anti two-blocking device) does not apply.	(a) The provisions of this Article 15 apply to dedicated pile drivers, except as specified in this section. (b) Section 1615.2(d)(3) (Anti two-blocking device) does not apply.	

SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
(c) Section 1926.1416(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after November 8, 2011. (d) In § 1926.1433, only §§ 1926.1433(d) and (e) apply to dedicated pile drivers.	(c) Section 1615.2(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after [Effective date]. (d) In Section 1610.4, only Sections 1610.4(d) and (e) apply to dedicated pile drivers.	
§ 1926.1440 Sideboom cranes.	§1694. Sideboom cranes.	
(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).	(b) Effective [Effective date] the provisions of this Article 15 apply, except Section 1610.5 (Ground conditions), Section 1615.1 (Safety devices), Section 1615.2 (Operational aids), and Section 1618.1 (Operator Qualification and Certification).	
(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.	(c) Section 1616.5 (Free fall and controlled load lowering) applies, except Section 1615.5 (a)(2)(A). Sideboom cranes in which the boom is designed to free fall (live boom) are permitted only if manufactured prior to [Effective date].	
(c) Sideboom cranes mounted on wheel or crawler tractors must meet all of the following requirements of ASME B30.14–2004 (incorporated by reference, see § 1926.6): (1) Section 14–1.1 (‘‘Load Ratings’’). (2) Section 14–1.3 (‘‘Side Boom Tractor Travel’’). (3) Section 14–1.5 (‘‘Ropes and Reeving Accessories’’). (4) Section 14–1.7.1 (‘‘Booms’’). (5) Section 14–1.7.2 (‘‘General Requirements – Exhaust Gases’’). (6) Section 14–1.7.3 (‘‘General requirements – Stabilizers (Wheel-Type Side Boom	(d) Sideboom cranes mounted on wheel or crawler tractors shall meet all of the following requirements of ASME B30.14–2004 (incorporated by reference): (1) Section 14–1.1 (“Load Ratings”). (2) Section 14–1.3 (“Side Boom Tractor Travel”). (3) Section 14–1.5 (“Ropes and Reeving Accessories”). (4) Section 14–1.7.1 (“Booms”). (5) Section 14–1.7.2 (“General Requirements – Exhaust Gases”). (6) Section 14–1.7.3 (“General requirements – Stabilizers (Wheel-Type Side Boom	

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FEDERAL: §1926	STATE:	RATIONALE
Tractors)’’). (7) Section 14–1.7.4 (‘‘General Requirements – Welded Construction’’). (8) Section 14–1.7.6 (‘‘General Requirements – Clutch and Brake Protection’’). (9) Section 14–2.2.2 (‘‘Testing—Rated Load Test’’), except that it applies only to equipment that has been altered or modified. (10) In section 14–3.1.2 (‘‘Operator Qualifications’’), paragraph (a), except the phrase ‘‘When required by law.’’ (11) In section 14–3.1.3 (‘‘Operating Practices’’), paragraphs (e), (f)(1)—(f)(4), (f)(6), (f)(7), (h), and (i). (12) In section 14–3.2.3 (‘‘Moving the Load’’), paragraphs (j), (l), and (m).	Tractors)”). (7) Section 14–1.7.4 (“General Requirements – Welded Construction”). (8) Section 14–1.7.6 (“General Requirements – Clutch and Brake Protection”). (9) Section 14–2.2.2 (“Testing—Rated Load Test”), except that it applies only to equipment that has been altered or modified. (10) In section 14–3.1.2 (“Operator Qualifications”), paragraph (a), except the phrase “When required by law.” (11) In section 14–3.1.3 (“Operating Practices”), paragraphs (e), (f)(1)—(f)(4), (f)(6), (f)(7), (h), and (i). (12) In section 14–3.2.3 (“Moving the Load”), paragraphs (j), (l), and (m).	
§ 1926.1441 Equipment with a rated hoisting/lifting capacity of 2,000 pounds or less.	§1610.8. Equipment with a rated hoisting/ lifting capacity of 2,000 pounds or less.	
The following paragraphs of this section specify requirements for employers using equipment with a maximum rated hoisting/lifting capacity of 2,000 pounds or less.	The following subsections specify requirements for employers using equipment with a maximum rated hoisting/lifting capacity of 2,000 pounds or less.	
(a) The employer using this equipment must comply with the following provisions of this subpart: § 1926.1400 (Scope); § 1926.1401 (Definitions); § 1926.1402 (Ground conditions); § 1926.1403 (Assembly/disassembly—selection of manufacturer or employer procedures); § 1926.1406 (Assembly/disassembly—employer	(a) The employer using this equipment shall comply with the following provisions of this Article 15: Section 1610.1 (Scope); Section 1610.3 (Definitions); Section 1610.5 (Ground conditions); Section 1611.1 (Assembly/disassembly – selection of manufacturer or employer procedures); Section 1611.4 (Assembly/disassembly – employer	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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).	procedures); Section 1611.5 and Sections 1612.1 through 1612.4 (Power line safety); Section 1613.3 (Post-assembly); Section 1613.10 (Wire Rope Inspection); Section 1614 (Wire Rope Selection); Section 1616.2 (Authority to stop operation); Sections 1617.1 through 1617.3 (Signals); Section 1610.7 (Fall protection); Section 1616.4 (Keeping clear of the load) [except for Section 1616.4(c)(2) (qualified rigger)]; Section 1616.5 (Free fall and controlled load lowering); Section 1616.7 (Multiple crane/derrick Lifts – supplemental requirements); Section 1610.6 (Equipment modifications); Section 1619.1 (Tower cranes); Section 1619.2 (Derricks); Section 1619.3 (Floating cranes/derricks and land cranes/derricks on barges); Section 1619.4 (Overhead & gantry cranes).	
(b) Assembly/disassembly. (1) In addition to compliance with §§ 1926.1403 (Assembly/disassembly— selection of manufacturer or employer procedures) and 1926.1406 (Assembly/disassembly—employer procedures), the employer must also comply with § 1926.1441(b)(2)–(3). (2) Components and configuration. The employer must ensure that: (i) The selection of components, and the configuration of the equipment, that affect the capacity or safe operation of the equipment complies with either the: (A) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and	(b) Assembly/disassembly. (1) In addition to compliance with Sections 1611.1 (Assembly/disassembly – selection of manufacturer or employer procedures) and 1611.4 (Assembly/disassembly – employer procedures), the employer shall also comply with Section 1610.8(b)(2)-(3). (2) Components and configuration. The employer shall ensure that: (A) The selection of components, and the configuration of the equipment, that affect the capacity or safe operation of the equipment complies with either the: 1. Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
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 § 1926.1434 (Equipment modifications). (ii) Post-assembly inspection. Upon completion of assembly, the equipment is inspected to ensure that it is in compliance with paragraph (b)(2)(i) of this section (see § 1926.1412(c) for postassembly inspection requirements). (3) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.	certified agent familiar with the type of equipment involved shall approve, in writing, the selection and configuration of components; or 2. Approved modifications that meet the requirements of Section 1610.6 (Equipment modifications). (B) Post-assembly inspection. Upon completion of assembly, the equipment is inspected to ensure that it is in compliance with subsection (b)(2)(A) of this section (see Section 1613.3 for post-assembly inspection requirements). (3) Manufacturer prohibitions. The employer shall comply with applicable manufacturer prohibitions.	
(c) Operation—procedures. (1) The employer must comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments. (2) Unavailable operation procedures. The employer must: (i) When the manufacturer's procedures are unavailable, develop, and ensure compliance with, all procedures necessary for the safe operation of the equipment and attachments. (ii) Ensure that procedures for the operational controls are developed by a qualified person. (iii) Ensure that procedures related to the capacity of the equipment are developed and signed by a registered professional engineer familiar with the equipment. (3) Accessibility. The employer must ensure	(c) Operation—procedures. (1) The employer shall comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments. (2) Unavailable operation procedures. The employer shall: (A) When the manufacturer's procedures are unavailable, develop, and ensure compliance with, all procedures necessary for the safe operation of the equipment and attachments. (B) Ensure that procedures for the operational controls are developed by a qualified person. (C) Ensure that procedures related to the capacity of the equipment are developed and signed by a certified agent familiar with the equipment.	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: §1926	STATE:	RATIONALE
that: (i) The load chart is available to the operator at the control station; (ii) Procedures applicable to the operation of the equipment, recommended operating speeds, special hazard warnings, instructions, and operator's manual are readily available for use by the operator. (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.	(3) Accessibility. The employer shall ensure that: (A) The load chart is available to the operator at the control station; (B) 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. (C) 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.	
(d) Safety devices and operational aids. (1) The employer must ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer procedures. (2) Anti two-blocking. The employer must ensure that equipment covered by this section manufactured more than one year after 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).	(d) Safety devices and operational aids. (1) The employer shall ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer's procedures. (2) Anti two-blocking. The employer shall ensure that equipment covered by this section manufactured more than one year after [Effective date] have either an anti two-block device that meets the requirements of Section 1615.2(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).	
(e) Operator qualifications. The employer must train each operator, prior to operating the equipment, on the safe operation of the type of	(e) Operator qualifications. The employer shall train each operator, prior to operating the equipment, on the safe operation of the type of	

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FEDERAL: §1926	STATE:	RATIONALE
equipment the operator will be using.	equipment the operator will be using.	
(f) Signal person qualifications. The employer must train each signal person in the proper use of signals applicable to the use of the equipment. (g) [Reserved.] (h) Inspections. The employer must ensure that equipment is inspected in accordance with manufacturer procedures. (i) [Reserved.] (j) Hoisting personnel. The employer must ensure that equipment covered by this section is not used to hoist personnel. (k) Design. The employer must ensure that the equipment is designed by a qualified engineer.	(f) Signal person qualifications. The employer shall train each signal person in the proper use of signals applicable to the use of the equipment. (g) [Reserved.] (h) Inspections. The employer shall ensure that equipment is inspected in accordance with manufacturer's procedures. (i) [Reserved.] (j) Hoisting personnel. The employer shall ensure that equipment covered by this section is not used to hoist personnel. (k) Design. The employer shall ensure that the equipment is designed by a qualified engineer.	
	§1610.9. Equipment over Three Tons Rated Capacity. (a) All cranes and derricks used in lifting service, exceeding three tons rated capacity, and their accessory gear shall not be used until the employer has ascertained that such equipment has been certificated as evidenced by current and valid documents attesting to compliance with the following: (1) Tests and examinations shall be conducted annually by a currently licensed certificating agency or designee listed in the certificating agency license, and a certificate shall be issued by the certificating agency; (2) Certificates attesting to current compliance with testing and examination standards of requirements shall be maintained for each crane or derrick and shall be in a form acceptable to	Section 1610.9 has been copied from GISO 5021 for safety equivalent to GISO standards for cranes and derricks in general industry.

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FEDERAL: §1926	STATE:	RATIONALE
	the Division. (See Section 4885, Plate V.) NOTE: The term "lifting service" as used in this Section is not intended to include operations of the following equipment: (1) Clamshells, draglines and other similar equipment used for casting-type work; (2) Pile drivers, other than those using gravity (drop) hammers.	
§ 1926.1442 Severability.		
Should a court of competent jurisdiction hold any provision(s) of subpart CC to be invalid, such action shall not affect any other provision of the subpart.		This is non-regulatory language unenforceable under the operational procedures and policies of the Division of Occupational Safety and Health and therefore not applicable.

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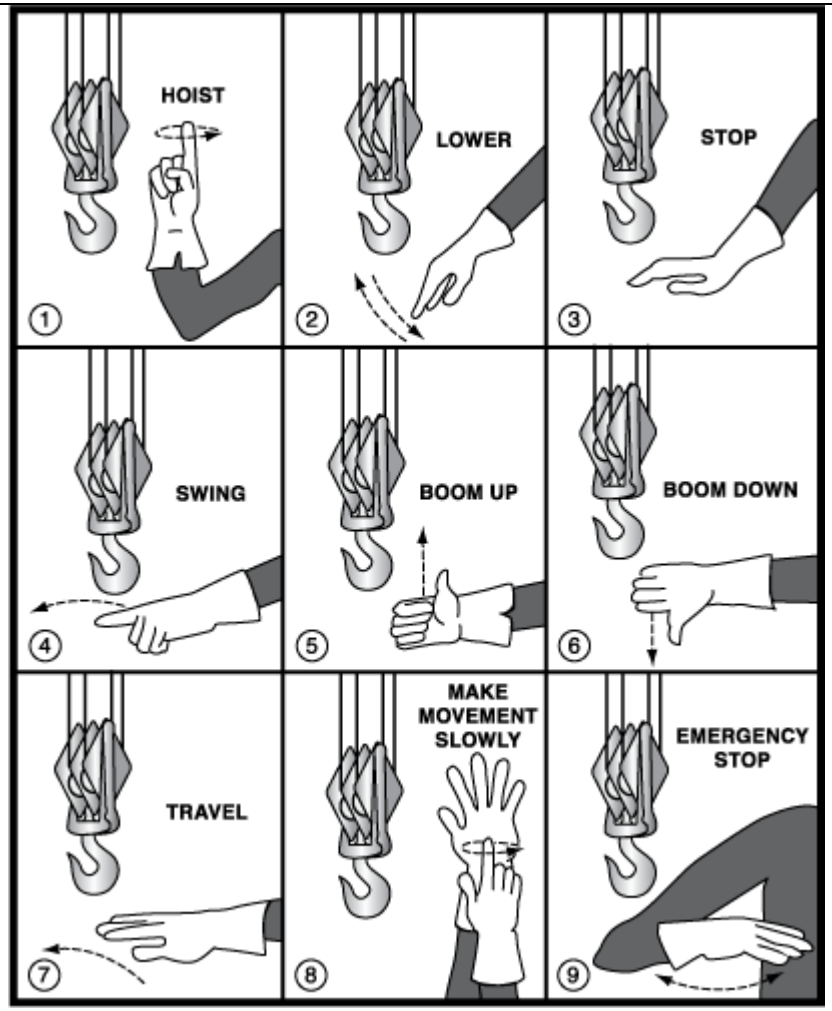
SCOPE: Applicable throughout state unless otherwise noted.

Federal: § 1926	State:	Rationale:
Appendix A to Subpart CC of Part 1926–Standard Hand Signals. **STOP –** With arm extended horizontally to the side, palm down, arm is swung back and forth. **EMERGENCY STOP** – With both arms extended horizontally to the side, palms down, arms are swung back and forth. **HOIST –** With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles. **RAISE BOOM –** With arm extended horizontally to the side, thumb points up with other fingers closed. **SWING –** With arm extended horizontally, index finger points in direction that boom is to swing. **RETRACT TELESCOPING BOOM –** With hands to the front at waist level, thumbs point at each other with other fingers closed. **RAISE THE BOOM AND LOWER THE LOAD –** With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired. **DOG EVERYTHING –** Hands held together at waist level. **LOWER –** With arm and index finger pointing down, hand and finger make small circles. **LOWER BOOM –** With arm extended horizontally to the side, thumb points down with other fingers closed.		California addresses hand signals in the GISO section as Plate No. 1 to section 5001, entitled: PLATE I - RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS These illustrations address hand signals for Crane Operations and all boom equipment operations.

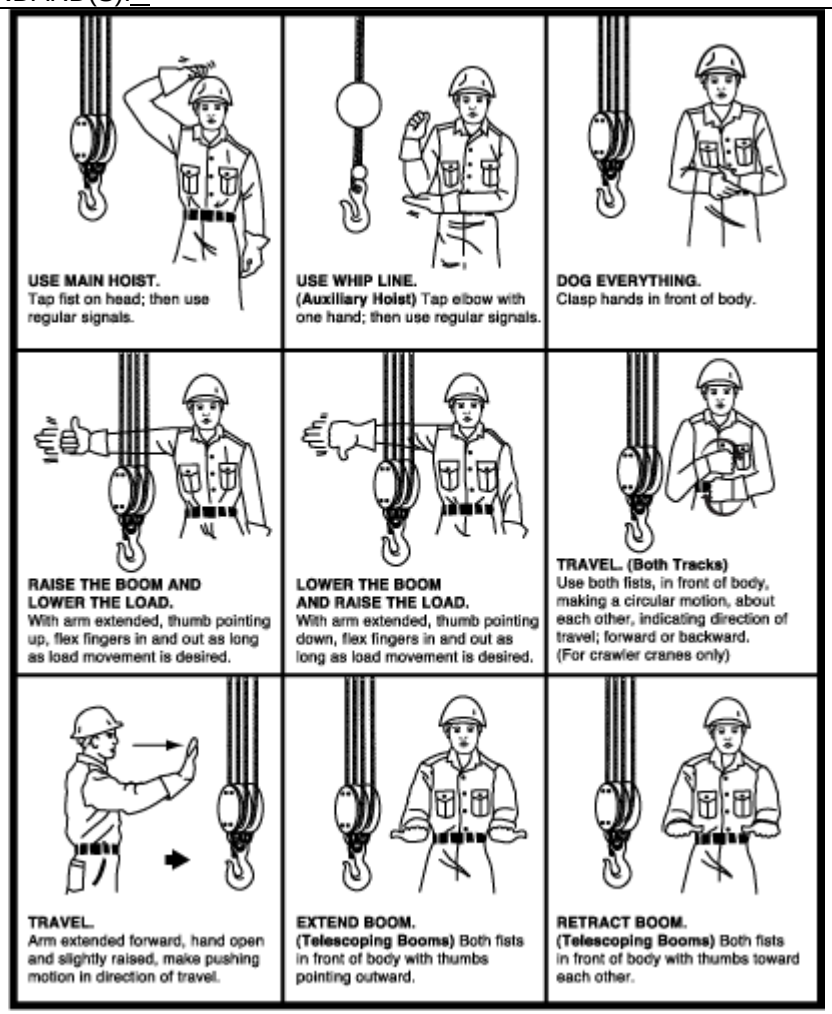
SOURCE OF FEDERAL OSHA STANDARD(S):_

SCOPE: Applicable throughout state unless otherwise noted.

Appendix A (continued)

EXTEND TELESCOPING BOOM – With hands to the front at waist level, thumbs point outward with other fingers closed.
TRAVEL/TOWER TRAVEL – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.
LOWER THE BOOM AND RAISE THE LOAD – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.

MOVE SLOWLY – A hand is placed in front of the hand that is giving the action signal.
USE AUXILIARY HOIST (whipline) **–** With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.
CRAWLER CRANE TRAVEL, BOTH TRACKS – Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.
USE MAIN HOIST – A hand taps on top of the head. Then regular signal is given to indicate desired action.



California addresses hand signals in the GISO section as Plate No. 1 to section 5001, entitled:

PLATE I - RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS

These illustrations address hand signals for Crane Operations and all boom equipment operations.

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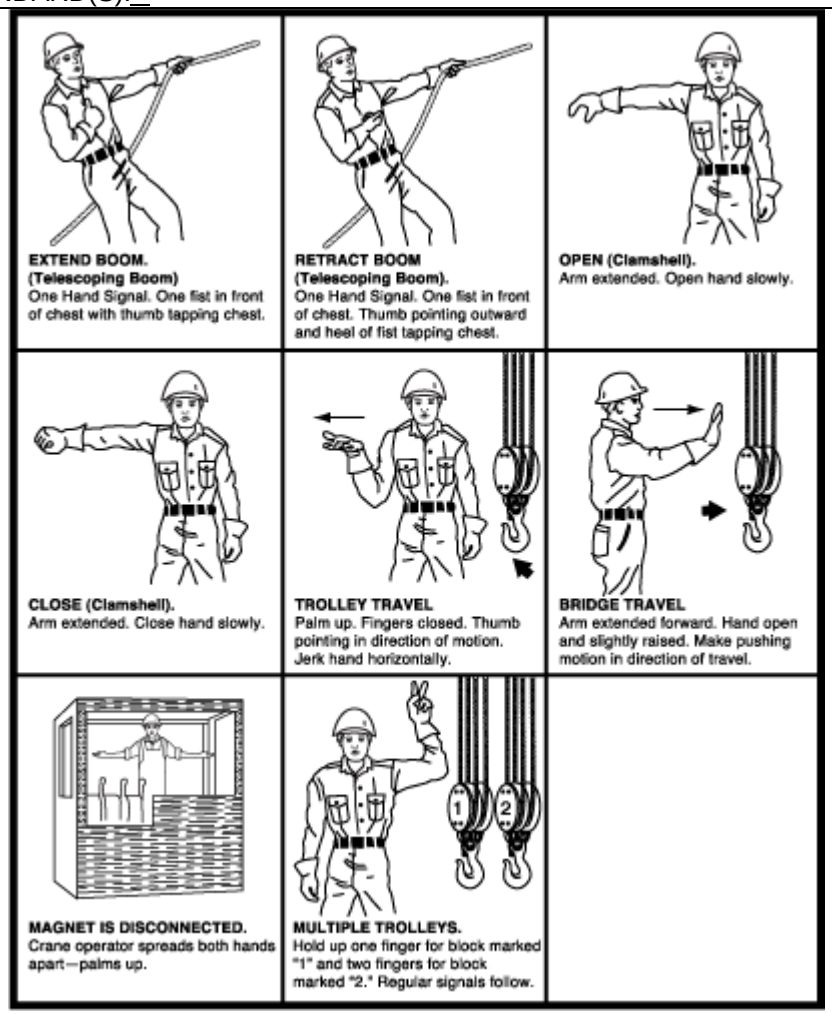
Appendix A (continued) **CRAWLER CRANE TRAVEL, ONE TRACK –** Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel. **TROLLEY TRAVEL** – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.		California addresses hand signals in the GISO section as Plate No. 1 to section 5001, entitled: PLATE I - RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS These illustrations address hand signals for Crane Operations and all boom equipment operations.
Appendix B to Subpart CC of Part 1926–Assembly/Disassembly: Sample		The Federal Appendix B is information only and is therefore

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Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement. 1. Section 1926.1404(f)(1) provides that when pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of § 1926.1404(f)(2) are met. The exception in § 1926.1404(f)(2) applies when the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed. In such a situation, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. The following scenario is an example of how the exception applies: A boom cannot be disassembled on the ground because of aboveground piping (as might be found, for example, in an oil refinery) that precludes lowering the boom to the ground. The boom must therefore be disassembled in the air, and the employees who remove the pins must perform that work from an aerial lift whose base is positioned on one side (the near side) of the boom. To gain access to the pins on the far side, the aerial lift basket must move under the boom, since, due to lack of room, the aerial lift cannot be repositioned on the far side. Due to lack of room, the aerial lift cannot be repositioned on the far side, so the aerial basket must move under the boom to gain access to the pins on the far side. To minimize the risk of unintended dangerous movement while the pins are removed, the A/D director uses an assist crane that is rigged to support the boom		unenforceable language.

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section that is being detached, using particular care to ensure that the section end that is near the employee(s) removing the pins is well supported. The duration and extent of exposure is minimized by removing the far side pins first, moving the aerial lift basket as soon as possible to the near side so that the employees are no longer under the boom, and then removing the near side pins. 2. Section 1926.1404(h)(6)(i) provides that, during assembly/disassembly, the center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. Section 1926.1404(h)(6)(ii) states that, where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used. An example of the application of § 1926.1404(h)(6)(ii) is as follows: The boom is assembled by lowering boom sections sequentially into place using an assist crane. The A/D director's plan is to keep the boom sections stable while they are lowered into place by attaching the assist crane hoist line above the center of gravity of each section. However, in assembling the non-symmetrical top section of the boom, the A/D director is not able to determine where to attach the assist crane hoist line so that it is above the center of gravity. In this situation, before raising the section, all personnel are kept clear of the section and the section is first raised a few inches to determine whether it tips when raised (if it did tip, it would indicate it is not rigged over the center of gravity). If this occurs, the hoist line is repositioned and the procedure repeated (with employees kept clear of the section while it is raised) until the A/D director determines that it is		The Federal Appendix B is information only and is therefore unenforceable language.

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rigged over the center of gravity and can be moved into place without dangerous movement		
Appendix C to Subpart CC of Part 1926–Operator Certification: Written Examination: Technical Knowledge Criteria. This appendix contains information for employers, accredited testing organizations, auditors and government entities developing criteria for a written examination to test an individual's technical knowledge relating to the operation of cranes. (a) General technical information. (1) The functions and limitations of the crane and attachments. (2) Wire rope: (i) Background information necessary to understand the inspection and removal from service criteria in § 1926.1413 and § 1926.1414. (ii) Capacity and when multi-part rope is needed. (iii) Relationship between line pull and safe working load. (iv) How to determine the manufacturer's recommended rope for the crane. (3) Rigging devices and their use, such as: (i) Slings. (ii) Spreaders. (iii) Lifting beams. (iv) Wire rope fittings, such as clips, shackles and wedge sockets. (v) Saddles (softeners). (vi) Clamps (beams). (4) The technical limitations of protective measures against electrical hazards: (i) Grounding. (ii) Proximity warning devices. (iii) Insulated links. (iv) Boom cages. (v) Proximity to electric power lines, radii, and microwave structures.		The Federal Appendix C is information only and is therefore unenforceable language.

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(5) The effects of load share and load transfer in multi-crane lifts. (6) Basic crane terms. (7) The basics of machine power flow systems. (i) Mechanical. (ii) Electrical. (iii) Pneumatic. (iv) Hydraulic. (v) Combination. (8) The significance of the instruments and gauge readings. (9) The effects of thermal expansion and contraction in hydraulic cylinders. (10) Background information necessary to understand the requirements of preoperation and inspection. (11) How to use the safety devices and operational aids required under § 1926.1415 and § 1926.1416. (12) The difference between duty-cycle and lifting operations. (13) How to calculate net capacity for every possible configuration of the equipment using the manufacturer's load chart. (14) How to use manufacturer-approved attachments and their effect on the equipment. (15) How to obtain dimensions, weight, and center of gravity of the load. (16) The effects of dynamic loading from: (i) Wind. (ii) Stopping and starting. (iii) Impact loading. (iv) Moving with the load. (17) The effect of side loading. (18) The principles of backward stability. (b) Site information. (1) How to identify the suitability of the supporting ground/surface to support the expected loads of the operation. Elements include: (i) Weaknesses below the surface (such as voids, tanks, loose fill). (ii) Weaknesses on the surface (such as		The Federal Appendix C is information only and is therefore unenforceable language.

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retaining walls, slopes, excavations, depressions). (2) Proper use of mats, blocking/cribbing, outriggers, stabilizers, or crawlers. (3) Identification of site hazards such as power lines, piping, and traffic. (4) How to review operation plans with supervisors and other workers (such as the signal person), including how to determine working height, boom length, load radius, and travel clearance. (5) How to determine if there is adequate room for extension of crawlers or outriggers/stabilizers and counterweights. (c) Operations. (1) How to pick, carry, swing and place the load smoothly and safely on rubber tires and on outriggers/stabilizers or crawlers (where applicable). (2) How to communicate at the site with supervisors, the crew and the signal person. (3) Proper procedures and methods of reeving wire ropes and methods of reeving multiple-part lines and selecting the proper load block and/or ball. (4) How to react to changes in conditions that affect the safe operation of the equipment. (5) How to shut down and secure the equipment properly when leaving it unattended. (6) Know how to apply the manufacturer's specifications for operating in various weather conditions, and understand how environmental conditions affect the safe operation of the equipment. (7) How to properly level the equipment. (8) How to verify the weight of the load and rigging prior to initiating the lift. (9) How to determine where the load is to be picked up and placed and how to verify the radii. (10) Know basic rigging procedures. (11) How to carry out the shift inspection required in this subpart.		The Federal Appendix C is information only and is therefore unenforceable language.

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(12) Know that the following operations require specific procedures and skill levels: (i) Multi-crane lifts. (ii) Hoisting personnel. (iii) Clamshell/dragline operations. (iv) Pile driving and extracting. (v) Concrete operations, including poured-in-place and tilt-up. (vi) Demolition operations. (vii) Operations on water. (viii) Magnet operations. (ix) Multi-drum operations. (13) Know the proper procedures for operating safely under the following conditions: (i) Traveling with suspended loads. (ii) Approaching a two-block condition. (iii) Operating near power lines. (iv) Hoisting personnel. (v) Using other than full outrigger/crawler or stabilizer extensions. (vi) Lifting loads from beneath the surface of the water. (vii) Using various approved counterweight configurations. (viii) Handling loads out of the operator's vision ("operating in the blind"). (ix) Using electronic communication systems for signal communication. (14) Know the proper procedures for load control and the use of hand-held tag lines. (15) Know the emergency response procedure for: (i) Fires. (ii) Power line contact. (iii) Loss of stability. (iv) Control malfunction. (v) Two-blocking. (vi) Overload. (vii) Carrier or travel malfunction. (16) Know how to properly use outriggers and stabilizers in accordance with manufacturer specifications. (d) Use of load charts.		The Federal Appendix C is information only and is therefore unenforceable language.

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(1) Know the terminology necessary to use load charts. (2) Know how to ensure that the load chart is the appropriate chart for the equipment in its particular configuration and application. (3) Know how to use load charts. This includes knowing: (i) The operational limitations of load charts and footnotes. (ii) How to relate the chart to the configuration of the crane, crawlers, or outriggers/stabilizers extended or retracted, jib erected or offset, and various counterweight configurations.		The Federal Appendix C is information only and is therefore unenforceable language.