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

FEDERAL: §	STATE:	RATIONALE
PART 1926—[AMENDED] **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.	**§4884 ~~Scope~~ Standards Incorporated 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.	Cranes shall be designed, constructed, and installed in accordance with the following 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 below.
(b) The materials listed in paragraphs (g) through (ff) of this section are incorporated by reference in the corresponding sections noted as		Fed/state formatting difference.

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

FEDERAL: §	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 Governmental Industrial Hygienists (ACGIH), 1330 Kemper Meadow Drive, Cincinnati, OH		N/A for this RM

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

FEDERAL: §	STATE:	RATIONALE
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, Dumbwaiters, Escalators, and Moving Walks Supplement, IBR approved for § 1926.552(d).		N/A for this RM

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

FEDERAL: §	STATE:	RATIONALE
(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 Insulating Hoods, IBR approved for § 1926.951(a).		

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

FEDERAL: §	STATE:	RATIONALE
(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 Testing and Materials (ASTM), ASTM International, 100 Barr Harbor Drive, PO Box		N/A for this RM

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

FEDERAL: §	STATE:	RATIONALE
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).		N/A for this RM
(l) The following material is available for purchase from the American Society of Mechanical Engineers (ASME), Three Park Avenue, New York, NY 10016; telephone: 1–800–843–2763; fax: 973–882–1717; e-	§4884 ~~Scope~~ Standards Incorporated by Reference. ***** (d) Cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and	These standards became effective on July 7, 2011 per CSO section 1610.2.

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

FEDERAL: §	STATE:	RATIONALE
mail: infocentral@asme.org; Web site: http://www.asme.org/:	installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference:	
(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).	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").	
	B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) B30.4-1996, Portal, Tower and Pedestal	*[Ed note: feds did not update]*
(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).	ASME B30.5–2004, Mobile and Locomotive Cranes, issued Sept. 27, 2004 ("ASME B30.5–2004").	
	B30.6-1995, Derricks	*[Ed note: feds did not update]*
(3) ASME B30.7–2001, Base-Mounted Drum Hoists, issued Jan. 21, 2002 (''ASME B30.7–2001''), IBR approved for § 1926.1436(e).	ASME B30.7–2001, Base-Mounted Drum Hoists, issued Jan. 21, 2002 ("ASME B30.7–2001").	
	B30.8-1982, Floating Cranes and Floating Derricks B30.11-1980, Monorails and Underhung Cranes B30.13-1977, Controlled Mechanical Storage Cranes	*[Ed note: feds did not update]*
(4) ASME B30.14–2004, Side Boom Tractors, issued Sept. 20, 2004 (''ASME B30.14-2004''), IBR approved for § 1926.1440(c).	ASME B30.14–2004, Side Boom Tractors, issued Sept. 20, 2004 ("ASME B30.14–2004").	
	B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist).	

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

FEDERAL: §	STATE:	RATIONALE
(5) ASME Boiler and Pressure Vessel Code, Section VIII, 1968, IBR approved for §§ 1926.152(i), 1926.306(a), and 1926.603(a).		N/A for this RM
(6) ASME Power Boilers, Section I, 1968, IBR approved for § 1926.603(a).		N/A for this RM
(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/:	§4884 ~~Scope~~ Standards Incorporated by Reference. ***** (1) In addition, cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference:	These standards became effective on July 7, 2011 per CSO section 1610.2.
(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).	(A) AWS D1.1/D1.1M:2002, Structural Welding Code—Steel, 18th ed., ANSI approved Aug. 31, 2001 ("AWS D1.1/D1.1M:2002").	
(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).	(B) ANSI/AWS D14.3–94, Specification for Welding Earthmoving and Construction Equipment, ANSI approved Jun. 11, 1993 ("ANSI/AWS D14.3–94").	
(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/:	§4884 ~~Scope~~ Standards Incorporated by Reference. ***** (1) In addition, cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: *****	These standards became effective on July 7, 2011 per CSO section 1610.2.
(1) BS EN 13000:2004, Cranes - Mobile	(C) BS EN 13000:2004, Cranes—Mobile	

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

FEDERAL: §	STATE:	RATIONALE
Cranes, published Jan. 4, 2006 (''BS EN 13000:2004''), IBR approved for § 1926.1433(c).	Cranes, published Jan. 4, 2006 ("BS EN 13000:2004").	
(2) BS EN 14439:2006, Cranes – Safety - Tower Cranes, published Jan. 31, 2007 (''BS EN 14439:2006''), IBR approved for § 1926.1433(c).	(D) BS EN 14439:2006, Cranes—Safety—Tower Cranes, published Jan. 31, 2007 ("BS EN 14439:2006").	
(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/:		N/A for this RM

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

FEDERAL: §	STATE:	RATIONALE
(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 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/:	§4884 ~~Scope~~ Standards Incorporated by Reference. ***** (1) In addition, cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference:	These standards became effective on July 7, 2011 per CSO section 1610.2.

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

FEDERAL: §	STATE:	RATIONALE
	*****	
(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).	(E) ISO 11660–1:2008(E), Cranes—Access, guards and restraints—Part 1: General, 2d ed., Feb. 15, 2008 ("ISO 11660–1:2008(E)").	
(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).	(F) ISO 11660–2:1994(E), Cranes—Access, guards and restraints—Part 2: Mobile cranes, 1994 ("ISO 11660–2:1994(E)").	
(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).	(G) ISO 11660–3:2008(E), Cranes—Access, guards and restraints—Part 3: Tower cranes, 2d ed., Feb. 15, 2008 ("ISO 11660–3:2008(E)").	
(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		N/A for this RM

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

FEDERAL: §	STATE:	RATIONALE
1926.155(f). (6) NFPA 385–1966, Standard for Tank Vehicles for Flammable and Combustible Liquids, IBR approved for § 1926.152(g). (z) [Reserved.]		
(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; 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).	§4884 ~~Scope~~ Standards Incorporated by Reference. ***** (1) In addition, cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: ***** (H) PCSA Std. No. 2, Mobile Hydraulic Crane Standards, 1968 ("PCSA Std. No. 2 (1968)").	These standards became effective on July 7, 2011 per CSO section 1610.2. Only PCSA Std. No. 2 applies to this RM.
(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/: (1) SAE 1970 Handbook, IBR approved for § 1926.602(b). (2) SAE 1971 Handbook, IBR approved for § 1926.1001(h).	§4884 ~~Scope~~ Standards Incorporated by Reference. ***** (1) In addition, cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following standards which are hereby incorporated by reference: *****	These standards became effective on July 7, 2011 per CSO section 1610.2.

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

FEDERAL: §	STATE:	RATIONALE
(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).		
(5) SAE J185 (reaf. May 2003), Access Systems for Off-Road Machines, reaffirmed May 2003 (''SAE J185 (May 1993)''), IBR approved for § 1926.1423(c).	(I) SAE J185 (reaf. May 2003), Access Systems for Off-Road Machines, reaffirmed May 2003 ("SAE J185 (May 1993)").	
(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 Robber-Tired Dozers, IBR approved for § 1926.1001(h).		Not applicable for this RM.

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

FEDERAL: §	STATE:	RATIONALE
(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). (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).	(J) SAE J987 (rev. Jun. 2003), Lattice Boom Cranes—Method of Test, revised Jun. 2003 ("SAE J987 (Jun. 2003)"). (K) SAE J1063 (rev. Nov. 1993), Cantilevered Boom Crane Structures—Method of Test, revised Nov. 1993 ("SAE J1063 (Nov. 1993)").	
(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 §		N/A for this RM

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

FEDERAL: §	STATE:	RATIONALE
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/: (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).		N/A for this RM
(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).	(B) Cranes and derricks manufactured after June 23, 1999 and before July 7, 2011 shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference: ***** B30.5-1994, Mobile and Locomotive Cranes	CA uses more recent standard for crawlers, locomotive and truck cranes covered by 1926.1433(a) (subject to this RM)
(4) ANSI B30.6–1969, Safety Code for Derricks, approved Dec. 18, 1967, IBR approved for § 1926.1501(e).		N/A for this RM
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

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

FEDERAL: §	STATE:	RATIONALE
		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 aerial lifts are set out exclusively in § 1926.453.		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.
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:		N/A for this RM.
§ 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. * * * * *		CA fall protection standards are horizontal.
(3) * * * (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		CA standards for stairs, ladders and guardrails are horizontal.

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

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otherwise stated in subpart CC. No other paragraphs of § 1926.502 apply to subpart CC. * * * * *		
(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. [Removed]		Subpart DD has been removed per Fed. Reg. Vol. 77, No. 160, August 17, 2012, pg. 49749. CA applies same standards to demo and underground construction as to any other type construction.
Subpart N—Cranes, Derricks, Hoists, Elevators, and Conveyors		
■ 10. The authority citation for subpart N of 29 CFR part 1926 is revised to read as follows: Authority: …		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 * * * * *		
§ 1926.550 [Redesignated as § 1926.1501]		
■ 12. Section 1926.550 is redesignated as § 1926.1501 in subpart DD.		Subpart DD has been removed (see above).
§ 1926.550 [Reserved]		
■ 13. Section 1926.550 is reserved. ■ 14. Section 1926.553 is amended by adding paragraph (c) to read as follows:		N/A for CA due to differences in formatting.
§ 1926.553 Base-mounted drum hoists. * * * * *		N/A for CA due to differences in formatting and precedence of orders.

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

FEDERAL: §	STATE:	RATIONALE
(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).		
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. * * *	**§2946. Provisions for Preventing Accidents Due to Proximity to Overhead Lines**	
(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:	(a) General. No person, firm, or corporation, or agent of same, shall require or permit any employee to perform any function in proximity to energized high-voltage lines; to enter upon any land, building, or other premises and there engage in any excavation, demolition, construction, repair, or other operation; or to erect, install, operate, or store in or upon such premises any tools, machinery, equipment, materials, or structures (including scaffolding, house moving, well drilling, pile driving, or hoisting equipment) unless and until danger from accidental contact with said high-voltage lines has been effectively guarded against. (b) Clearances or Safeguards Required. Except where overhead electrical distribution and transmission lines have been de-energized and visibly grounded, the following provisions shall be met:	

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

FEDERAL: §	STATE:	RATIONALE
	***	
(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 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;	(2) The operation, erection, handling, or transportation of tools, machinery, materials, structures, scaffolds, or the moving of any house or other building, or any other activity where any parts of the above or any part of an employee's body will come closer than the minimum clearances from energized overhead lines as set forth in Table 1 shall be prohibited. *** Operation of boom-type equipment shall conform to the minimum clearances set forth in Table 2, except in transit where the boom is lowered and there is no load attached, in which case the distances specified in Table 1 shall apply. TABLE 1 General Clearances Required from Energized Overhead High-Voltage Conductors Nominal voltage (Phase to Phase) — Minimum Required Clearance (Feet) 600..... 50,000 — 6 over 50,000..... 345,000 — 10 over 345,000.... 750,000 — 16 over 750,000.... 1,000,000 — 20 (3) Boom-type lifting or hoisting equipment. The erection, operation or dismantling of any boom-type lifting or hoisting equipment, or any part thereof, closer than the minimum clearances from energized overhead high-voltage lines set forth in Table 2 shall be prohibited.	

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

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	*** (d) Any overhead conductor shall be considered to be energized unless and until the person owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site. TABLE 2 Boom-type lifting or hoisting equipment clearances required from energized overhead high-voltage lines. Nominal voltage (Phase to Phase) / Minimum Required Clearance (Feet) 600..... 50,000 10 over 50,000..... 75,000 11 over 75,000..... 125,000 13 over 125,000.... 175,000 15 over 175,000.... 250,000 17 over 250,000.... 370,000 21 over 370,000.... 550,000 27 over 550,000.... 1,000,000 42	
(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;	(e) 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;	(f) 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 section of these Safety Orders 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	(d) Any overhead conductor shall be considered to be energized unless and until the person	

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

FEDERAL: §	STATE:	RATIONALE
owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded;	owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site.	
	§5005. Work Near Transmitter Towers.	
(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:	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 an 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 electrical ground directly to the upper rotating structure supporting the boom; and	(a) The equipment shall be provided with an 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.	(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.	(c) Combustible and flammable materials shall be removed from the immediate area prior to operations.	
Subpart R—Steel Erection		
■ 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:		

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FEDERAL: §	STATE:	RATIONALE
§ 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.
Subpart S—Underground Construction, Caissons, Cofferdams, and Compressed Air		Federal changes proposed for Subpart S, promulgated August 21, 2012, are part of a separate rulemaking heard July 18, 2013 and adopted November 21, 2013.
■ 19. The authority citation for subpart S of 29 CFR part 1926 is revised to read as follows: …		
■ 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		Federal changes proposed for 1926.800, are part of a separate rulemaking heard July 18, 2013 and adopted November 21, 2013.

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

FEDERAL: §	STATE:	RATIONALE
elevator requirement of §§ 1926.552(a) and (d) of this part. * * * * *		
Subpart T—Demolition		
■ 21. The authority citation for subpart T of 29 CFR part 1926 continues to read as follows: …		Federal changes proposed for Subpart T, promulgated August 21, 2012, were heard July 18, 2013 and were adopted November 21, 2013.
■ 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.		
■ 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.		Federal changes proposed for Subpart T, promulgated August 21, 2012, are part of a separate rulemaking heard July 18, 2013 and adopted November 21, 2013.
Subpart V—Power Transmission and Distribution		
■ 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.	§2940.7(c) Derrick Trucks, Cranes and Other	CA counterpart is High-Voltage Electrical

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

FEDERAL: §	STATE:	RATIONALE
* * * * * (c) Cranes and other lifting equipment.	Lifting Equipment.	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. 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).
(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: (i) The mechanical equipment is insulated, or (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.		Covered by §2940.7(c)(2) Derrick Trucks, Cranes and Other Lifting Equipment, except that 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).
Subpart X—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		The subject of stairways and ladders is covered

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

FEDERAL: §	STATE:	RATIONALE
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 covered under 29 CFR part 1926, 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. * * * * *		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 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	**Title 8, Chapter 4, Subchapter 7, General Industry Safety Orders, Group 13, Cranes and Other Hoisting Equipment.**	CA counterpart is Title 8, Chapter 4, Subchapter 7, General Industry Safety Orders, Group 13, Cranes and Other Hoisting Equipment.
Sec.		Formatting difference between fed and CA.

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

FEDERAL: §	STATE:	RATIONALE
1926.1400 Scope. 1926.1401 Definitions. 1926.1402 Ground conditions. 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). 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.		This is an index / non-regulatory.

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

FEDERAL: §	STATE:	RATIONALE
1926.1421 Signals—voice signals—additional requirements. 1926.1422 Signals—hand signal chart. 1926.1423 Fall protection. 1926.1424 Work area control. 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		

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

FEDERAL: §	STATE:	RATIONALE
Unintended Dangerous Boom Movement Appendix C to Subpart CC of part 1926—Operator Certification—Written Examination—Technical Knowledge Criteria		
Subpart CC—Cranes and Derricks in Construction		
§ 1926.1400 Scope.	**§4880 Scope.**	
	(a) The Orders in this Group shall apply to derricks, cranes, and boom-type excavators, but they shall not apply to aerial devices designed and used for positioning personnel (See Article 24). *[relocated from §4884(a)]*	1926 amended for placement in GISO.
(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; side boom cranes; derricks; and variations of such equipment. However, items listed in paragraph (c) of this section are	(1) This standard applies to power operated equipment that can hoist, lower and horizontally move a suspended load with or without attachments. Such equipment includes, but is not limited to: Articulating boom cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to **raise or lower by means of a hoist** and horizontally move a suspended load; industrial cranes (such as carry deck cranes); cranes being used as 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/bridge and gantry cranes; straddle cranes; side boom cranes; derricks; and variations of such equipment. However, items	Amended with subcommittee and Washington State WAC 296-155-52900 clarifications.

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

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excluded from the scope of this standard.	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 lines, personnel platforms, augers or drills and pile driving equipment.	(b) Attachments. This standard applies to equipment included in subsection (a) of this section when used with attachments. Such attachments, whether crane-attached or suspended include, but are not limited to: Hooks, magnets, grapples, clamshell buckets, orange peel buckets, concrete buckets, drag lines, personnel platforms, augers or drills and pile driving equipment.	
(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.	(c) Exclusions. Group 13 does not cover: (1) Machinery included in section (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, and excavators (except as prescribed by Article 94), wheel loaders, backhoes, loader backhoes, track loaders. This machinery is also excluded when used with chains, slings or other rigging to lift suspended loads.	Review with AC: Amended to clarify applicability to power shovels and excavators.
(3) Automotive wreckers and tow trucks when used to clear wrecks and haul vehicles.	(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	(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.	The ESO and TCSO correspond to 1926 subpart Part V and with 1910.268 respectively.

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

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construction work for telecommunication service (as defined at 29 CFR 1910.268(s)(40)) must comply with 29 CFR 1910.268.	(B) Digger derricks used in construction work for telecommunication service (as defined in the Telecommunication Safety Orders) shall comply with those Safety Orders.	
(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.	(5) Machinery originally designed as vehicle-mounted aerial devices (for lifting personnel) and self-propelled elevating work platforms. (6) Telescopic/hydraulic gantry systems. (7) Stacker cranes.	
(8) Powered industrial trucks (forklifts), except when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load.	(8) Powered industrial trucks (forklifts) except when configured to **raise or** lower by means of a hoist and horizontally move a suspended load.	Modifications based on OSHA CPL 02-01-057 and 1/21/15 subcommittee clarifications.
(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.	(10) **Multi-purpose machines or industrial trucks (forklifts) hoisting by use of** a come-along or chainfall.	Clarified as amended by subcommittee 1/21/15. "Machinery" is too broad for exclusion; it could exclude all come-alongs and chain falls from Group 13.
(11) Dedicated drilling rigs. (12) Gin poles when used for the erection of communication towers.	(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) Unpowered, rolling material lifts with hand-powered winches (roustabouts). (15) Helicopter cranes.	Definition for "roustabout" copied from 1610.1(c)(14)

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

FEDERAL: §	STATE:	RATIONALE
(17) Material Delivery (i) Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting. (ii) Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning 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		California does not permit exclusions for articulating/knuckle-boom cranes. Review with DOSH

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

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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.	§4880. Scope. (d) All sections of Group 13 apply to the equipment within the scope of this standard unless specified otherwise.	
(e) The duties of controlling entities under this subpart include, but are not limited to, the duties specified in § 1926.1402(c), § 1926.1402(e) and § 1926.1424(b).		This subsection is redundant and unnecessary in California.
(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.	(e) For work covered by the High-Voltage Electrical Safety Orders, compliance with those Orders is deemed compliance with §§5003.1 through 5003.4 and §5010.4.	
(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	(f) Section 4991.1 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	

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Administration requirements. See § 1926.1402(f).	Administration requirements. See Exception to §4991.1.	
§ 1926.1401 Definitions.	**§4885. Definitions.**	Unless otherwise noted, the following definitions are, or will be in GISO §4885.
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 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.	
Articulating crane means a crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders.	Articulating Boom Crane. A crane whose boom consists of a series of folding, pin connected structural members, typically manipulated to extend or retract by power from hydraulic cylinders. ~~articulated by hydraulic cylinders, powered by an internal combustion engine or electric motor.~~	
Assembly/Disassembly means the assembly and/or disassembly of equipment covered under this standard. With regard to tower cranes, ''erecting and climbing'' replaces the term ''assembly,'' and ''dismantling'' replaces the term ''disassembly.'' Regardless of whether the crane is initially erected to its full height or is climbed in stages, the process of increasing the height of the crane is an erection process.	Assembly/Disassembly means the assembly and/or disassembly of equipment covered under this 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. 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	Audible signal. A signal made by a distinct	

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distinct sound or series of sounds. Examples include, but are not limited to, sounds made by a bell, horn, or whistle.	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.	
Bogie means ‘‘travel bogie,’’ which is defined below.	Bogie. See “travel bogie.”	
Boom (equipment other than tower crane) means an inclined spar, strut, or other long structural member which supports the upper hoisting tackle on a crane or derrick. Typically, the length and vertical angle of the boom can be varied to achieve increased height or height and reach when lifting loads. Booms can usually be grouped into general categories of hydraulically extendible, cantilevered type, latticed section, cable supported type or articulating type.	Boom. 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.	
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. The angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is	

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	a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.	
	Boom Hoist. A hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.	
Boom hoist limiting device includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.	Boom hoist limiting device. Includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device, or derricking limiter. This type of device disengages boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengaged.	
Boom length indicator indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	Boom length indicator. Indicates the length of the permanent part of the boom (such as ruled markings on the boom) or, as in some computerized systems, the length of the boom with extensions/attachments.	
Boom 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.	Boomstop. ~~A device used to limit the angle of the boom at the highest position.~~ 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.	

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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.	
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 for 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.	§3207. Definitions. Competent Person. 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.	Add this definition to §3207 (verbiage copied from §1504 for consistency)
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	§4885. 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	

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brake, to lower the load.	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.	§336.10(c) The employer who was responsible, by contract or through actual practice, for safety and health conditions on the worksite; i.e., the employer who had the authority for ensuring that the hazardous condition is corrected (the controlling employer); or	Title 8, Section 336.10 applies to multi-employer worksites.
Counterweight means a weight used to supplement the weight of equipment in providing stability for lifting loads by counterbalancing those loads.	§4885. Counterweight. A weight used to supplement the weight of the equipment ~~machine~~ in providing stability for lifting working loads by counterbalancing those loads.	
Crane/derrick includes all equipment covered by this subpart.		Redundant: cranes and derricks are defined, and coverage is covered by the scope, Section 4880.
Crawler crane means equipment that has a type of base mounting which incorporates a continuous belt of sprocket driven track.	§4885. 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 T8 definition for "Crawler Crane"
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 point. Location 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.	
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	Dedicated pile-driver is a machine that is designed to function exclusively as a pile-driver. These machines typically have the	

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ability to both hoist the material that will be pile-driven and to pile-drive that material.	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 §5001.3 (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.	
Directly under the load means a part or all of an employee is directly beneath the load.	Directly under the load means a part or all of an employee is directly beneath the load.	
Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).	Dismantling includes partial dismantling (such as dismantling to shorten a boom or substitute a different component).	
Drum rotation indicator means a device on a crane or hoist which indicates in which direction and at what relative speed a particular hoist drum is turning.	Drum rotation indicator. 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.	*This term is only used in 4988.9 "Floating Derricks & Cranes"*
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 these Orders require to be maintained from a power line.	

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Equipment means equipment covered by this subpart.		Unnecessary, and may actually result in less effective standard since it restricts the definition of "equipment" to this subpart or group.
Equipment criteria means instructions, recommendations, limitations and specifications.	Equipment criteria means 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.	§3207. Personal Fall Protection System. A personal fall protection system includes personal fall arrest systems, positioning device systems, fall restraint systems, safety nets and guardrails.	Horizontal definition from sec. 3207. 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.	§3207. Personal Fall Restraint System. A system used to prevent an employee from falling. It consists of an anchorage, connectors, and body belt/harness. It may include, lanyards, lifelines, and rope grabs designed for that purpose.	Horizontal definition from sec. 3207.
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.	§4885. 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.''		Unnecessary due to CA formatting and usage.

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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. ~~An apparatus for raising or lowering a load by the application of a pulling force, but~~ A mechanical device for lifting and lowering loads by winding a line onto or off a drum. ~~d~~Does not include a car or platform riding in guides. Some common types of hoists are defined as follows:	Adopt federal verbiage, but retain existing state clarification.
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 Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	Insulating link/device means an insulating device listed, labeled, or accepted by a Nationally Recognized Testing Laboratory in accordance with 29 CFR 1910.7.	
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). 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 is 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	List means the angle of inclination about the	

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longitudinal axis of a barge, pontoons, vessel or other means of floatation.	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 ~~(Working). The external load in pounds applied on the hoisting line, including the weight of load attaching equipment such as load blocks, shackles, slings, buckets, and magnets.~~ 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 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	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 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	

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severity of loading on the equipment remain operational, e.g., lowering, telescoping in, or luffing in.	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" requires no definition; furthermore, this definition is too narrow and restrictive.
Multi-purpose machine means a machine that is designed to be configured in various ways, at least one of which allows it to hoist (by means of a winch or hook) and horizontally move a suspended load. For example, a machine that can rotate and can be configured with removable forks/tongs (for use as a forklift) or	Multi-Purpose Machine. A machine, **other than a crane or derrick,** that is designed to be configured **and used** in various ways, at least one of which allows it to **raise or lower ~~hoist~~** by means of a **hoist** and horizontally move a suspended load.	Clarified as modified by 1/21/15 subcommittee. Examples were eliminated as they can be interpreted to limit application and to find loopholes in the standard.

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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.		
Nationally recognized accrediting agency is an organization that, due to its independence and expertise, is widely recognized as competent to accredit testing organizations. Examples of such accrediting agencies include, but are not limited to, the National Commission for Certifying Agencies and the American National Standards Institute.	Nationally Recognized Accrediting Agency. 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.	
Nonconductive means that, because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).	Nonconductive. Because of the nature and condition of the materials used, and the conditions of use (including environmental conditions and condition of the material), the object in question has the property of not becoming energized (that is, it has high dielectric properties offering a high resistance to the passage of current under the conditions of use).	
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 §5018 (“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	Operator. A person who is operating the	

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equipment.	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.		Not applicable for CA formatting.
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 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 include both wire and bar types: (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.	Fed verbiage reformatted to CA style.
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.	§3207. Definitions. Personal Fall Arrest System. A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of the aforementioned components/devices.	
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	Crane, Portal Crane (Whirley Type). ~~A gantry crane without trolley motion, which has a boom attached to a revolving crane mounted on a gantry, with the boom capable of being raised~~	

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travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	~~or lowered at its head (outer end). Portal cranes may be fixed or mobile.~~ A type of crane consisting of a rotating upperstructure, hoist machinery, and boom mounted on top of a structural gantry which may be fixed in one location or have travel capability. The gantry legs or columns usually have portal openings in between to allow passage of traffic beneath the gantry.	
Power lines means electric transmission and distribution lines.	Power lines means 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 3206.	Amended for CA differences. CA will retain reference to 29 CFR 1910.7.
Qualified evaluator (not a third party) means a person employed by the signal person's employer who has demonstrated that he/she is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	Qualified evaluator (not a third party). 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 these Orders for a signal person.	
Qualified evaluator (third party) means an entity that, due to its independence and expertise, has demonstrated that it is competent in accurately assessing whether individuals meet the Qualification Requirements in this subpart for a signal person.	Qualified evaluator (third party). 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 these Orders for a signal person.	

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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.	§3207. Definitions. 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.	Use §3207 definition for consistency throughout the Safety Orders.
Qualified rigger is a rigger who meets the criteria for a qualified person.	Qualified rigger. 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 limiter.	Rated capacity limiter: See load moment limiter.	
Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	Repetitive pickup points refer to, when operating on a short cycle operation, the rope being used on a single layer and being spooled repetitively over a short portion of the drum.	
Running wire rope means a wire rope that	Running Wire Rope. A wire rope that moves	

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moves over sheaves or drums.	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.		N/A due to CA formatting differences.
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. The protocol illustrated in Section 5001, Plate I, for hand signals.	
Such as means ‘‘such as, but not limited to.’’	Such as means “such as, but not limited to.”	
Superstructure: See Upperworks.	Superstructure: See “Upperworks.”	
Tagline means a rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	Tagline. A rope (usually fiber) attached to a lifted load for purposes of controlling load spinning and pendular motions or used to stabilize a bucket or magnet during material handling operations.	
Tender means an individual responsible for monitoring and communicating with a diver.	Tender. An individual responsible for monitoring and communicating with a diver.	
Tilt up or tilt down operation means	Tilt Up or Tilt Down Operation.	

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raising/lowering a load from the horizontal to vertical or vertical to horizontal.	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.	(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.	CA Section 4885, definition of "Tower Crane" also includes an illustrations (Figs. 15-17), thus we believe it is equally effective.
Travel bogie (tower cranes) is an assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.	Travel bogie (tower cranes). See "Trolley." Trolley (tower cranes). An assembly of two or more axles arranged to permit vertical wheel displacement and equalize the loading on the wheels.	"Trolley" is more commonly used in CA.
Trim means angle of inclination about the transverse axis of a barge, pontoons, vessel or other means of floatation.	Trim. The angle of inclination about the transverse 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	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.

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continued application of power can cause failure of the hoist rope or other component.		
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.	**§ 4991.1. Ground conditions.**	
(a) Definitions. (1) ''Ground conditions'' means the ability of the ground to support the equipment (including slope, compaction, and firmness). (2) ''Supporting materials'' means blocking, mats, cribbing, marsh buggies (in marshes/ wetlands), or similar supporting materials or devices.	(a) Definitions. (1) "Ground conditions" means the ability of the ground to support the equipment (including slope, compaction, and firmness). (2) "Supporting materials." Blocking, mats, 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	(b) The equipment shall 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	

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support and degree of level of the equipment are met. The requirement for the ground to be drained does not apply to marshes/wetlands.	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. (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.	(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 regarding ~~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 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.	(e) If the A/D director or the operator determines that ground conditions do not meet the requirements in subsection (b), that person's employer shall have a discussion with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials/devices (if necessary), the requirements in 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	Exception: This section does not apply to cranes designed for use on railroad tracks when used on railroad tracks that are part of the	

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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.	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.	**§ 5010. 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).)	(a) When assembling or disassembling equipment (or attachments), the employer shall comply with all applicable manufacturer prohibitions and shall comply with either: (1) Manufacturer procedures applicable to assembly and disassembly, or (2) Written employer procedures for assembly and disassembly. Employer procedures may be used only where the employer can demonstrate that the procedures used comply with all provisions of these Safety Orders, including the requirements in §5010.3.	The Note is not proposed for inclusion as it appears to imply that manufacturer's procedures need not be followed when other slings are used.
§ 1926.1404 Assembly/Disassembly—general requirements (applies to all assembly and disassembly operations).	**§ 5010.1. Assembly/Disassembly – General 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	(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	

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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.	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. (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.	(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. (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)(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	(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	

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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.	in, on, or under the equipment, or near the equipment (or load) where the crew member could be injured by movement of the equipment (or load), the crew member shall inform the operator that he/she is going to that location. (2) Where the operator knows that a crew member went to a location covered by paragraph (e)(1) of this section, the operator shall not move any part of the equipment (or load) until the operator 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. (2) Exception. Where the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. (See Non-mandatory Appendix B of this subpart for an example.)	(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.	Federal exception is less protective than CA.
(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	(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	

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equipment accessories, must not be exceeded for the equipment being assembled/ disassembled.	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:	(h) Addressing specific hazards. The A/D director supervising the assembly/disassembly operation shall 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).	(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 § 4991.1 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.	(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 must be appropriately placed to: (i) Protect the structural integrity of the equipment, and (ii) Prevent dangerous movement and collapse.	(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.	
(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.	(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 §4999(b) 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.	(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.	

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(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.)	(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 must be rigged or supported to maintain stability upon the removal of the pins.	(7) Stability upon pin removal. The boom sections, boom suspension systems (such as gantry A-frames and jib struts), and components shall be rigged or supported to maintain stability upon the removal of the pins.	
(8) Snagging. Suspension ropes and pendants must not be allowed to catch on the boom or jib connection pins or cotter pins (including keepers and locking pins).	(8) Snagging. Suspension ropes and pendants 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 counterweights.	(9) Struck by counterweights. The potential for unintended movement from inadequately supported counterweights and from hoisting 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	(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	

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a boom hoist brake failure must be used.	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.]	(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.	(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 certified agent familiar with the type of equipment involved shall determine in writing this limitation, which must 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 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	(m) Components and configuration. (1) The selection of components, and configuration of the equipment, that affect the capacity or safe operation of the equipment shall be in accordance with: (A) Manufacturer instructions, prohibitions, limitations, and specifications. Where these are unavailable, a certified agent 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 §4884.1 (Equipment modifications). (2) Post-assembly inspection. Upon completion	

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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.]	of assembly, the equipment shall be inspected to ensure compliance with paragraph (m)(1) of this section (see §5031.2 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. (2) The outriggers must be set to remove the equipment weight from the wheels, except for locomotive cranes (see paragraph (q)(6) of this section for use of outriggers on locomotive cranes). This provision does not apply to stabilizers. (3) When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers. (4) Each outrigger or stabilizer must be visible to the operator or to a signal person during	(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. (2) The outriggers shall be set to remove the equipment weight from the wheels, except for locomotive cranes (see paragraph (q)(6) of this section for use of outriggers on locomotive cranes). This provision does not apply to stabilizers. (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	

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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.	extension and setting. (5) Outrigger and stabilizer blocking shall: (A) Meet the requirements in paragraphs (h)(2) and (h)(3) of this section. (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 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.	(r) Rigging. In addition to following the requirements in Article 101 of these Orders 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 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.	Federal verbiage amended with additional state requirements found in Article 101.
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	(3) Additional requirements for the protection of all types of slings are contained in Article 101 of these Orders.	State is more protective; Article 101 is not limited to wire rope and synthetic slings.

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recommendations must be followed.		
§ 1926.1405 Disassembly—additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures).	**§ 5010.2. 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.	Note: "Dismantling" includes dismantling for changing the length of booms and jibs.	CA clarification.
(a) None of the pins in the pendants are to be removed (partly or completely) when the pendants are in tension.	(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.	(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).	(c) None of the pins (top or bottom) on boom sections located between the uppermost boom section and the crane/derrick body are to be removed (partly or completely) when the boom is being supported by the uppermost boom section resting on the ground (or other support).	
(d) None of the top pins on boom sections located on the cantilevered portion of the boom being removed (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.	**§ 5010.3. Assembly/Disassembly – Employer Procedures – General Requirements.**	
(a) When using employer procedures instead of manufacturer procedures for assembly/ disassembly, the employer must ensure that the	(a) When using employer procedures instead of manufacturer procedures for assembly/ disassembly, the employer shall ensure that the	

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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.	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.	(b) Qualified person. Employer procedures shall be developed by a qualified person.	
§ 1926.1407 Power line safety (up to 350 kV)—assembly and disassembly.	**§ 5010.4. 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 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:	(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, in the direction or area of assembly/ disassembly, closer than 20 feet to a power line during the assembly/disassembly process. If so, the employer 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.	(1) Option (1) – De-energize and ground. Confirm from the utility owner/operator that the power line has been de-energized 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.	(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.	

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(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.	(3) Option (3) – Table A clearance. (A) Determine the line's voltage and the minimum clearance distance permitted under Table A (see §5003.1). (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 §5003.1). If so, then the employer shall 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.	
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2), or Option (3) of this section, all of the following requirements must be met: (1) Conduct a planning meeting with the Assembly/Disassembly director (A/D director), operator, assembly/disassembly crew and the other workers who will be in the assembly/ disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/ electrocution. (2) If tag lines are used, they must be nonconductive. (3) At least one of the following additional measures must be in place. The measure selected from this list must be effective in preventing encroachment. The additional measures are:	(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: (1) Conduct a planning meeting with the Assembly/Disassembly director (A/D director), operator, assembly/disassembly crew and the other workers who will be in the assembly/ disassembly area to review the location of the power line(s) and the steps that will be implemented to prevent encroachment/ electrocution. (2) If tag lines are used, they shall be nonconductive. (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:	

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(i) Use a dedicated spotter who is in continuous contact with the equipment operator. The dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible lineof-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the required clearance distance can be maintained. (ii) A proximity alarm set to give the operator sufficient warning to prevent encroachment. (iii) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device must be set to give the operator sufficient warning to prevent encroachment. (iv) A device that automatically limits range of movement, set to prevent encroachment. (v) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	(A) Use a dedicated spotter who is in continuous contact with the equipment operator. 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 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 proximity alarm set to give the operator sufficient warning to prevent encroachment. (C) A device that automatically warns the operator when to stop movement, such as a range control warning device. Such a device shall be set to give the operator sufficient warning to prevent encroachment. (D) A device that automatically limits range of movement, set to prevent encroachment. (E) An elevated warning line, barricade, or line of signs, in view of the operator, equipped with flags or similar high-visibility markings.	
(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line,	(c) Assembly/disassembly below power lines prohibited. No part of a crane/derrick, load line,	

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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.	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 de-energized 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.	(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 §5003.1) to a power line unless the employer has confirmed that the utility owner/operator has de-energized and (at the worksite) visibly grounded the power line.	
(e) Voltage information. Where Option (3) of this section is used, the utility owner/operator of the power lines must provide the requested voltage information within two working days of the employer's request.	(e) Voltage information. Where Option (3) 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.	
(f) Power lines presumed energized. The employer must assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.	(f) Power lines presumed energized. The employer shall assume that all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized and visibly grounded at the worksite.	
(g) Posting of electrocution warnings. There must be at least one electrocution hazard warning conspicuously posted in the cab so that it is in view of the operator and (except for overhead gantry and tower cranes) at least two on the outside of the equipment.	(g) Posting of electrocution warnings. There 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	**§ 5003.1. Power Line Safety (Up to 350kV) –**	

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350kV)—equipment operations.	**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, 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	(2) Determine if any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get closer than 20 feet to a power line. If so, the employer must meet the requirements in Option (1), Option (2), or Option (3) of this section, as follows: (A) Option (1)—De-energize and ground. Confirm from the utility owner/operator that the power line has been de-energized 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 paragraph (b) of this section. (C) Option (3)—Table A clearance. 1. Determine the line's voltage and the minimum approach distance permitted under	

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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.	Table A. 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 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.	
(b) Preventing encroachment/electrocution. Where encroachment precautions are required under Option (2) or Option (3) of this section, all of the following requirements must be met: (1) Conduct a planning meeting with the 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	(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: (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	

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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).	line, a dedicated spotter must 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. (ii) A dedicated spotter who is in continuous contact with the operator. Where this measure is selected, the dedicated spotter must: (A) Be equipped with a visual aid to assist in identifying the minimum clearance distance. Examples of a visual aid include, but are not limited to: A clearly visible line painted on the ground; a clearly visible line of stanchions; a set of clearly visible line-of-sight landmarks (such as a fence post behind the dedicated spotter and a building corner ahead of the dedicated spotter). (B) Be positioned to effectively gauge the clearance distance. (C) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (D) Give timely information to the operator so that the 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.	(4) Implement at least one of the following measures: (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 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 must be set to give the operator sufficient warning to prevent encroachment. (C) A device that automatically limits range of movement, set to prevent encroachment.	Same as previously adopted for CSO 1612.1 which is being relocated to this GISO section.

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(iv) A device that automatically limits range of movement, set to prevent encroachment. (v) An insulating link/device, as defined in § 1926.1401, installed at a point between the end of the load line (or below) and the load.		
(5) The requirements of paragraph (b)(4) of this section do not apply to work covered by subpart V of this part.		Section (b)(4) supplements HV-ESO.
(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 allowed below a power line unless the employer has confirmed that the utility owner/ operator has deenergized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph (d)(2) of this section applies. (2) Exceptions. Paragraph (d)(1) of this section is inapplicable where the employer demonstrates that one of the following applies: (i) The work is covered by subpart V of this part. (ii) For equipment with non-extensible booms: The 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.	(d) Operations below power lines. (1) No part of the equipment, load line, or load (including rigging and lifting accessories) is allowed below a power line unless the employer has confirmed that the utility owner/ operator has de-energized 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: (A) The work is covered by Title 8 High-Voltage Electrical Safety Orders. (B) For equipment with non-extensible booms: The uppermost part of the equipment, with the boom at true vertical, would be more than 20 feet below the plane of the power line or more than the Table A of this section minimum clearance distance below the plane of the power line.	

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(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.	(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 paragraph (d)(1) of this section is infeasible and meets the requirements of §5003.3.	
(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 continues to be deenergized and visibly grounded at the worksite.	2946(d) Any overhead conductor shall be considered to be energized unless and until the person owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site.	
(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 de-energized 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.	(e) 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 de-energized or the following precautions must 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	(f) 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	

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training must include: (A) Information regarding the danger of electrocution from the operator simultaneously touching the equipment and the ground. (B) The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab. (C) The safest means of evacuating from equipment that may be energized. (D) The danger of the potentially energized zone around the equipment (step potential). (E) The need for crew in the area to avoid approaching or touching the equipment and the load. (F) Safe clearance distance from power lines. (ii) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite. (iii) Power lines are presumed to be uninsulated unless the utility owner/operator or a registered engineer who is a qualified person with respect to electrical power 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.	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. (B) Power lines are presumed to be energized unless the utility owner/operator confirms that the power line has been and continues to be de-energized 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. (D) The limitations of an insulating link/device, proximity alarm, and range control (and similar) device, if used. (E) The procedures to be followed to properly ground equipment and the limitations of grounding.	
(2) Employees working as dedicated spotters must be trained to enable them to effectively	(2) Employees working as dedicated spotters shall be trained to enable them to effectively	

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<table>
<tr><th>FEDERAL: §</th><th>STATE:</th><th>RATIONALE</th></tr>
<tr><td>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).</td><td>perform their task, including training on the applicable requirements of this section.
(3) Training under this section shall be administered in accordance with §3203.</td><td></td></tr>
<tr><td>(h) Devices originally designed by the manufacturer for use as: A safety device (see § 1926.1415), operational aid, or a means to prevent power line contact or electrocution, when used to comply with this section, must meet the manufacturer’s procedures for use and conditions of use.</td><td>(g) Devices originally designed by the manufacturer for use as: A safety device (see §5017), 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.</td><td></td></tr>
<tr><td>TABLE A—MINIMUM CLEARANCE DISTANCES
Voltage
(nominal, kV, alternating current)
Minimum clearance distance (feet)
up to 50
..... 10
over 50 to 200
..... 15
over 200 to 350
..... 20
over 350 to 500
..... 25
over 500 to 750
..... 35
over 750 to 1,000
..... 45
over 1,000
.....
(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).
Note: The value that follows ‘‘to’’ is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.</td><td>TABLE A—MINIMUM CLEARANCE DISTANCES
<table><tr><th>Voltage (nominal, kV, alternating current)</th><th>Minimum clearance distance (feet)</th></tr><tr><td>up to 50</td><td>10</td></tr><tr><td>over 50 to 175</td><td>15</td></tr><tr><td>over 175 to 350</td><td>20</td></tr><tr><td>over 350 to 550</td><td>27</td></tr><tr><td>over 550 to 1,000</td><td>45</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>
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.</td><td>CA Section 5003.1, 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 Federal Table A or CA Section 2946, Table 2, whichever is more protective.</td></tr>
<tr><td>§ 1926.1409 Power line safety (over 350kV).</td><td>§ 5003.2. Power Line Safety (Over 350kV).</td><td></td></tr>
<tr><td>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,</td><td>The requirements of §5010.4 and §5003.1 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</td><td></td></tr>
</table>

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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.	(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.	**§ 5003.3. 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 § 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. (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.	(a) 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 § 5003.1 to an energized power line is prohibited except as permitted by the High-Voltage Electrical Safety Orders.	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). [See also sections 2940.7 and 2944(d)].
(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		

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

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

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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 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		

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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 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.		

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(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 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		

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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.]		
(m) The employer must train each operator and crew member assigned to work with the equipment in accordance with § 1926.1408(g).		
	(b) Except where overhead electrical distribution and transmission lines have been de-energized and visibly grounded, the operation, erection, or handling of tools, machinery, apparatus, supplies, or materials, or any part thereof, over ~~energized overhead high-voltage~~ power lines is prohibited.	State subsection (b) proposed to be added for equivalency with HVESO 2946(b)(1). [Same as CSO 1612.3(b)] (modified for clarity)
§ 1926.1411 Power line safety—while traveling under or near power lines with no load.	**§ 5003.4. 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 §§ 5003.1, 5003.2 or 5003.3, whichever is appropriate, and §4991. (1) The provisions of Electrical Safety Orders, Group 2, Article 37, shall also apply to any	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.

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	work in proximity to overhead power lines where more protective.	
(b) The employer must ensure that: (1) The boom/mast and boom/mast support system are lowered sufficiently to meet the requirements of this paragraph. (2) The clearances specified in Table T of this section are maintained. (3) The effects of speed and terrain on equipment movement (including movement of the boom/mast) are considered so that those effects do not cause the minimum clearance distances specified in Table T of this section to be breached. (4) Dedicated spotter. If any part of the equipment while traveling will get closer than 20 feet to the power line, the employer must ensure that a dedicated spotter who is in continuous contact with the driver/operator is used. The dedicated spotter must: (i) Be positioned to effectively gauge the clearance distance. (ii) Where necessary, use equipment that enables the dedicated spotter to communicate directly with the operator. (iii) Give timely information to the operator so that the required clearance distance can be maintained. (5) Additional precautions for traveling in poor visibility. When traveling at night, or in conditions of poor visibility, in addition to the measures specified in paragraphs (b)(1) through (4) of this section, the employer must ensure that:	(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 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 paragraphs (b)(1) through (4) of this section, the employer shall ensure that:	

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<table>
<tr><th>FEDERAL: §</th><th>STATE:</th><th>RATIONALE</th></tr>
<tr><td>(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>(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>
<tr><td>§ 1926.1412 Inspections.</td><td>§5020. Operational Testing.</td><td></td></tr>
<tr><td></td><td>(a) In addition to prototype tests by the manufacturer, and prior to initial use, each new crane or derrick, or any crane or derrick which is structurally altered due to repair, modification or additions affecting the derrick’s capacity or safe operation shall be inspected and tested by a ~~the~~ certified agent to insure compliance with the provisions of these orders, including the following functions where applicable:
(1) Hoisting and lowering boom and load
(2) Swing mechanism
(3) Travel mechanisms, trolley, bridge, carrier
(4) Limit switches, locking, and other safety devices
(b) Visual examination shall be made of welds</td><td>[Note: Existing state verbiage, based on 1910.179(k) and 1910.180(e)].</td></tr>
</table>

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	and other attachments of the critically stressed members. (c) Where the complete production crane is not supplied by one manufacturer, such tests shall be conducted at final assembly.	
(a) Modified equipment.	§5022. Proof Load Test and Examination of Cranes and Their Accessory Gear. (a) Proof load tests of cranes shall be carried out by a certified agent at the following intervals: (1) Cranes exceeding 1 ton rated capacity:	1 ton trigger added for clarity. B30 Standards exclude cranes 1 ton or less in capacity. 29 CFR 1926 sections 1427, 1433 and 1441 recognize cut-off at 1 ton or less. Fed OSHA interprets 1910.179(k)(2) to require testing for all overhead and gantry-type cranes and has cited Cal-OSHA as not ALAEA. 1910.179(b) incorporates B30.2.0-1967. Section I of B30.2.0-1967 states that it applies to cranes exceeding 1 ton capacity.
(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:	*** (C)~~(3)~~ In the case of major modifications or repairs ~~to important structural components~~ which affect the safe operation of the equipment (such as but not limited to 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 certified agent after such modifications/ additions have been completed, before they are returned to service. *** 5022(d) An examination shall be carried out in conjunction with each proof load test…	Per GISO 5021, 5022, and Labor Code Section 7375, proof load testing must be conducted by a certificating agency for all cranes exceeding 3 tons rated capacity. 1926. 1412(a)(1) requires inspection by a "qualified person." A person qualified to perform this work is a certified agent. Section 5020(a) (above) requires testing prior to initial use.
(i) The inspection must assure that the modifications or additions have been done in accordance with the approval obtained pursuant	(A) The examination shall assure that the modifications or additions have been done in accordance with the approval obtained pursuant	

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to § 1926.1434 (Equipment modifications).	to §4884.1 (Equipment modifications).	
(ii) The inspection must include functional testing of the equipment.	5022(d) An examination shall be carried out in conjunction with each proof load test. The certificating agency shall make a determination as to requirements for the correction of deficiencies found. The examination shall cover the following points as applicable: (1) All functional operating mechanisms for improper function, maladjustment, cracks, distortion, or ~~and~~ excessive component wear, with particular attention to sheaves, pins, and drums, bearings, shafts, gears, rollers, and locking devices. This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed. (2) All safety devices and operational aids for ~~malfunction~~ proper operation (including significant inaccuracies). (3) Deterioration, abnormal wear or performance or leakage in lines, tanks, valves, drains, pumps, joints, fittings and other parts of ~~air or~~ pneumatic, hydraulic or other pressurized systems. (4) 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. Cracked or deformed hooks shall be discarded. (5) Rope reeving for compliance with certified agent's recommendations. (6) Deformed, cracked, or excessively corroded members in crane structure and boom. (7) Loose bolts, rivets, or other connections. (8) Worn, cracked, or distorted parts affecting safe operation. (9) Excessive wear on and free operation of brake	

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	and clutch system parts, linings, pawls, and ratchets. (10) Load, boom angle, or other indicators shall be checked for any inaccuracy. (11) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the certified agent's capacity ratings at all operating radii, for all permissible boom lengths and jib length, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included and operating controls marked or an explanation of controls shall be posted at the operator's position to indicate function. (12) Careful examination of the 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. (13) It shall be ascertained that no counterweights in excess of the certified agent's specifications are fitted. (14) Electrical components and wiring for cracked or split insulation and loose or corroded terminations. (15) Operator seat: Installed and serviceable. (16) Originally equipped steps, ladders, handrails, guards: Missing. (17) Steps, ladders, handrails, guards: In usable and safe condition. (18)~~(14)~~ Such other examinations deemed necessary under the circumstances.	
(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.	§5022. Proof Load Test and Examination of Cranes and Their Accessory Gear. (a) … *** (C)~~(3)~~ In the case of major modifications or	Covered by 5022(a)(1)(C) above, excerpt copied here.

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	repairs… before they are returned to service.	
(b) Repaired/adjusted equipment. (1) Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in use operating mechanism), must be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use.	5022(a)(1)(C) (C)~~(3)~~ In the case of major modifications or repairs ~~to important structural components~~ which affect the safe operation of the equipment (such as but not limited to 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 before they are returned to service. *** (d) An examination shall be carried out in conjunction with each proof load test. The certificating agency shall make a determination as to requirements for the correction of deficiencies found…	Repaired/adjusted equipment is covered by section 5022, including subsections (a)(1)(C) and 5022(d) which require inspections and certification by a certificating agency.
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.	5022(d) An examination shall be carried out in conjunction with each proof load test. The certificating agency shall determine if repairs/adjustments meet manufacturer equipment criteria (where applicable and available). Where manufacturer equipment criteria are unavailable or inapplicable, t~~T~~he certificating agency shall make a determination as to requirements for the correction of deficiencies found.	A certified agent, per section 4885, is a licensed professional engineer (RPE) and is qualified to make these determinations.

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(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.	5022(d) An examination shall be carried out in conjunction with each proof load test… The examination shall cover the following points as applicable: (1) All functional operating mechanisms for improper function, maladjustment, cracks, distortion, or ~~and~~ excessive component wear, with particular attention to sheaves, pins, and drums, bearings, shafts, gears, rollers, and locking devices. This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed. (2) All safety devices and operational aids for ~~malfunction~~ proper operation (including significant inaccuracies).	Section 5022(d) lists a number of inspection criteria which require functional testing.
(4) Equipment must not be used until an inspection under this paragraph demonstrates that the repair/adjustment meets the requirements of paragraph (b)(1)(i) of this section (or, where applicable, paragraph (b)(1)(ii) of this section).	5020 (Operational Testing). (a) … prior to initial use, each new crane or derrick, or any crane or derrick which is structurally altered due to repair, modification or additions affecting the derrick's capacity or safe operation shall be inspected and tested by the certified agent to insure compliance with the provisions of these orders, including the following functions where applicable:…	
(c) Post-assembly.	**§5031.2. Inspection – Post-Assembly (mandatory for Cranes and Derricks in Construction).**	*Question for AC: shouldn't the provisions of 5031.2 apply to GI as well?(i.e. eliminate the "for cranes and derricks in construction")*
(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.	(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.	

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	Note: Disassembly and reassembly of equipment does not require recertification of the equipment provided that the equipment is reassembled and used in a manner consistent with its certification.	
(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.	(b) Where manufacturer equipment criteria are unavailable, the 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 section demonstrates and documents that the equipment is configured in accordance with the applicable criteria. NOTE: Applicable criteria are prescribed in Articles 99 (Testing) and 100 (Inspection and Maintenance) of these Orders. See Article 96 for Tower Cranes.	A certified agent, per section 4885, is a licensed professional engineer (RPE).
(d) Each shift. (1) A competent person must begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift.	§5031. Inspection. (a) Each shift. ~~A~~ The operator or other 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.	CA requires inspection to be completed prior to operation.
The inspection must consist of observation for	The inspection shall consist of observation for	

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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.	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 is more protective – repairs must be made prior to use.
At a minimum the inspection must include all of the following:	~~(b) Frequency of Inspections. Daily visual inspections by the operator or other qualified person shall be made of/for:~~ At a minimum the inspection shall include all of the following (as applicable):	
(i) Control mechanisms for maladjustments interfering with proper operation.	(1) All functional mechanisms for maladjustment interfering with proper operation;	
(ii) Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter.	(2) Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter.	
(iii) Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation.	(3) Lines, tanks, valves, pumps, and other parts of air, ~~or~~ hydraulic, or other pressurized systems for deterioration or leakage, particularly lines which flex in normal operation. ~~;~~	
(iv) Hydraulic system for proper fluid level.	(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) ~~(4)~~ Hooks and latches for deformation, ~~and~~ cracks, excessive wear, or damage such as from chemicals or heat. ~~;~~	

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	(6)~~(5)~~ Hoist or load attachment chains including end connections for excessive wear, twist, distorted or stretched links interfering with proper function;	
	(7)~~(6)~~ Excessive wear, broken wires, stretch, kinking, or twisting of ropes and rope slings, including end connections.	
(vi) Wire rope reeving for compliance with the manufacturer's specifications.	(8) Wire rope reeving for compliance with the manufacturer's specifications.	
(vii) Wire rope, in accordance with § 1926.1413(a).	(7)(A) See §5036(d) for additional requirements for cranes in construction.	
(viii) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.	(9) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.	
(ix) Tires (when in use) for proper inflation and condition.	(10) 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.	(11) 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.	
(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.	(12) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup.	
(xii) Operator cab windows for significant cracks, breaks, or other deficiencies that would	(13) Operator cab windows for significant cracks, breaks, or other deficiencies that would	

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hamper the operator's view.	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.	(14) 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.	
(xiv) Safety devices and operational aids for proper operation.	(15) Safety devices and operational aids for proper operation.	
	(16) ~~(2)~~ The operation of all limit switches without a load on the hook;	Retain (E) state requirement (not covered in federal).
(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. (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.	§5031. …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.	Section 5031 requires all deficiencies to be corrected promptly.
(e) Monthly.	5031(b) ~~(e)~~ Periodic inspections. (1) Frequency: (A) Periodic inspections shall be conducted at	

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	least four times a year. (B) ~~(c)(3)~~ Cranes handling molten metal shall be inspected at least weekly when in use and necessary repairs made. (2) The annual certification, as required by Section 5021(a), 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.	
(1) Each month the equipment is in service it must be inspected in accordance with paragraph (d) of this section (each shift). (2) Equipment must not be used until an inspection under this paragraph demonstrates that no corrective action under paragraphs (d)(2) and (3) of this section is required.	(3) The inspection shall include the following in addition to the items in subsection (a) ~~(b)~~ above: (A) ~~(1)~~ Excessive wear of all functional operating mechanisms. (B) ~~(2)~~ Ropes, brakes, friction clutches, chain drives, and other parts subject to wear which may be readily inspected.	These provisions, copied from GISO 5031(c) are more protective than federal monthly inspections which merely require documentation of daily inspections. 5031(a) requires all deficiencies to be corrected promptly. 5031(b)(3)(A)-(B) are in addition to federal requirements.
	~~(3) Cranes handling molten metal shall be inspected at least weekly when in use and necessary repairs made.~~	5031(c)(3) has been relocated to (b)(1)(B) above.
(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.	(C) ~~(4)~~ An inspection record shall be maintained which includes the items checked and the results of the inspection, 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 most recent~~ Inspection records shall be maintained on file for a minimum of three months.	
(f) Annual/comprehensive. (1) At least every 12 months the equipment	(c) ~~(d)~~ Annual/comprehensive. In any year in which no quadrennial (every four years) proof	*See also 5031(c)(6)-(c)(8) below, which correspond to 1926.1412(f)(5)-(f)(7).*

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must be inspected by a qualified person in accordance with paragraph (d) of this section (each shift) except that the corrective action set forth in paragraphs (f)(4), (f)(5), and (f)(6) of this section must apply in place of the corrective action required by paragraphs (d)(2) and (d)(3) of this section. (2) In addition, at least every 12 months, the equipment must be inspected by a qualified person.	load test is required on cranes or derricks, such equipment shall be examined by a qualified person as described in Section 5021. Such examination shall be made not later than the anniversary date of the quadrennial certification and shall conform with the requirements of Section 5022(d), and the following:	
Disassembly is required, as necessary, to complete the inspection. The equipment must be inspected for all of the following:	5031(c)~~(d)~~(4) Whenever it is considered necessary by the certificating agency or authorized representative and 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.	
	5022(d) An examination shall be carried out in conjunction with each proof load test. The certificating agency shall make a determination as to requirements for the correction of deficiencies found. The examination shall cover the following points as applicable:	5022(d) is shown to give context and also to illustrate that the requirements of 5022(d) [referenced in 5031(c) above] satisfy the requirements of 1926.1412(f). Note: 5022(d) examinations are not limited to quadrennial load testing, [5031(c) above requires annual compliance with 5022(d) (including subsections below)].
(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.	5022(d) *** (6) Deformed, cracked, or excessively corroded members in crane structure and boom. (7) Loose bolts, rivets, or other connections. (8) Worn, cracked, or distorted parts affecting safe operation .	

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	*** (12) Careful examination of the 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. ***	
(C) Welds for cracks.	5022(d)(14) Welds for cracks.	
(ii) Sheaves and drums for cracks or significant wear. (iii) Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.	5022(d)(1) All functional operating mechanisms for improper function, maladjustment, cracks, distortion, or ~~and~~ excessive component wear, with particular attention to sheaves, pins, and drums, bearings, shafts, gears, rollers, and locking devices.	
(iv) Brake and clutch system parts, linings, pawls and ratchets for excessive wear.	5022(d)(9) Excessive wear on and free operation of brake and clutch system parts, linings, pawls, and ratchets.	
(v) Safety devices and operational aids for proper operation (including significant inaccuracies).	5022(d)(2) All safety devices and operational aids for ~~malfunction~~ proper operation (including significant inaccuracies).	
	5031.1 Additional Inspection Requirements for Cranes in Construction Service. At least every 12 months the following equipment shall be inspected by a qualified person as described in Section 5021. Such examination shall include the points listed in Section 5022(d), and the following:	This subsection added due to combining CDAC construction requirements into General Industry Safety Orders. *Question for AC: might some of these requirements apply to GI as well? Could 5031.1 be rolled into 5031?*
(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.	(a) 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.	(b) Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.	

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(viii) Travel steering, brakes, and locking devices, for proper operation.	(c) Travel steering, brakes, and locking devices, for proper operation.	
(ix) Tires for damage or excessive wear.	(d) Tires for damage or excessive wear.	
(x) Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, as follows: (A) Flexible hose or its junction with the fittings for indications of leaks. (B) Threaded or clamped joints for leaks. (C) Outer covering of the hose for blistering, abnormal deformation or other signs of failure/ impending failure. (D) Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing. (xi) Hydraulic and pneumatic pumps and motors, as follows: (A) Performance indicators: Unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure. (B) Loose bolts or fasteners. (C) Shaft seals and joints between pump sections for leaks. (xii) Hydraulic and pneumatic valves, as follows: (A) Spools: Sticking, improper return to neutral, and leaks. (B) Leaks. (C) Valve housing cracks. (D) Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed). (xiii) Hydraulic and pneumatic cylinders, as follows: (A) Drifting caused by fluid leaking across the	5022(d)(3) Deterioration, abnormal wear or performance or leakage in lines, tanks, valves, drains, pumps, joints, fittings and other parts of ~~air or~~ pneumatic, hydraulic or other pressurized systems.	5022(d)(3) covers all the provisions of 1926.1412(f)(2)(x) - (xiii)

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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.		
	5031.1. Additional Inspection Requirements for Cranes in Construction Service.	
(xiv) Outrigger or stabilizer pads/floats for excessive wear or cracks.	(e) Outrigger or stabilizer pads/floats for excessive wear or cracks.	
(xv) Slider pads for excessive wear or cracks.	(f) Slider pads for excessive wear or cracks.	
(xvi) Electrical components and wiring for cracked or split insulation and loose or corroded terminations.	5022(d)(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.	5022(d)(11) It shall be ascertained that there is a durable rating chart visible to the operator, covering the complete range of the certified agent's capacity ratings at all operating radii, for all permissible boom lengths and jib length, with alternate ratings for optional equipment affecting such ratings. Necessary precautions or warnings shall be included and operating controls marked or an explanation of controls shall be posted at the operator's position to indicate function.	
(xviii) Originally equipped operator seat (or equivalent): Missing. (xix) Operator seat: Unserviceable.	5022(d)(16) Operator seat: Installed and serviceable.	
(xx) Originally equipped steps, ladders, handrails, guards: Missing.	5022(d)(17) Originally equipped steps, ladders, handrails, guards: Missing.	
(xxi) Steps, ladders, handrails, guards: In unusable/unsafe condition.	5022(d)(18) Steps, ladders, handrails, guards: In usable and safe condition.	
(3) This inspection must include functional testing to determine that the equipment as	5022(d) An examination shall be carried out in conjunction with each proof load test. The	5022(d) which requires functional testing and determination as to requirements for correction

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configured in the inspection is functioning properly.	certificating agency shall determine if repairs/adjustments meet manufacturer equipment criteria (where applicable and available). Where manufacturer equipment criteria are unavailable or inapplicable, t~~T~~he certificating agency shall make a determination as to requirements for the correction of deficiencies found. The examination shall cover the following points as applicable: (1) All functional operating mechanisms for improper function, maladjustment, cracks, distortion, or ~~and~~ excessive component wear, with particular attention to sheaves, pins, and drums, bearings, shafts, gears, rollers, and locking devices. This shall include operation with partial load, in which all functions and movements, including, where applicable, maximum possible rotation in both directions, are performed. (2) All safety devices and operational aids for ~~malfunction~~ proper operation (including significant inaccuracies).	of deficiencies found.
(4) If any deficiency is identified, an immediate determination must be made by the qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections.	5031(c)(5) 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 monthly inspections.	
(5) If the qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in § 1926.1416(d) or § 1926.1435(e). See	5031(c)(6) 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 §5018(d) or §4968.2.	

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§ 1926.1417.		
(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.	5031(c)(7) 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.	5031(c)(8) Documentation of annual/ comprehensive inspection. An inspection record shall be maintained which includes the items checked and the results of the inspection, the date of the inspection, the name and signature of the person who performed the inspection, and the serial number or other identifier of the crane inspected. Inspection records shall be maintained on file for a minimum of 12 months by the employer that conducts the inspection. The most recent inspection record shall be maintained on file. (See section 5025)	Needed to add reference to section 5025 in (c)(8) for clarity and equivalent.
(g) Severe service. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer must stop using the equipment and a qualified person must: (1) Inspect the equipment for structural damage to determine if the equipment can continue to be used safely. (2) In light of the use/conditions determine whether any items/conditions listed in	§5031.3. Inspection – Severe Service. Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), the employer shall stop using the equipment and a certified agent shall: (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 section	

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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.	5031(c) (Inspection – Annual/Comprehensive) need to be inspected; if so, the certified agent shall inspect those items/conditions. (3) If a deficiency is found, the employer shall follow the requirements in sections 5031(c)(5) through (c)(7).	
(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.]	§5031.4. Inspection – Equipment Idle for 3 Months or More. Equipment that has been idle for 3 months or more shall be inspected by a qualified person in accordance with the requirements of section 5031(b) and shall have a valid certificate as required by section 5021 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, 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.	5031(d) Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the requirements of this section 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.	§5031. Inspection. *** (c)(8) Documentation of annual/ comprehensive inspection. An inspection record shall be maintained which includes the items checked and the results of the inspection, the date of the inspection, the name and signature of the person who performed the inspection, and the serial number or other identifier of the crane inspected. Inspection records shall be maintained on file for a minimum of 12 months by the employer that conducts the inspection. The most recent inspection	

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	record shall be maintained on file. All documents produced under this section must be available, during the applicable document retention period, to all persons who conduct inspections under this section.	
§ 1926.1413 Wire rope—inspection.	**§5036. Inspection – Wire Rope (Additional requirements for cranes in construction).**	
(a) Shift inspection.	(d) Shift inspection. Shift inspection shall be in accordance with provisions of section 5031(a) for wire rope, hooks, latches, attachment chains, slings, connections and reeving.	5031(a) is reiterated in next row.
	§5031. Inspection. (a) Each shift.	
(1) A competent person must begin a visual inspection prior to each shift the equipment is used, which must be completed before or during that shift. The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies, including those listed in paragraph (a)(2) of this section. Untwisting (opening) of wire rope or booming down is not required as part of this inspection.	The operator or other 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 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. 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. At a minimum the inspection shall include all of the following (as applicable): *** (5)~~(4)~~ Hooks and latches for deformation, ~~and~~	CA standard requires the inspection to be completed prior to the first operation, and requires such inspections to be made by a qualified person.

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	cracks, excessive wear, or damage such as from chemicals or heat. (6)~~(5)~~ Hoist or load attachment chains including end connections for excessive wear, twist, distorted or stretched links interfering with proper function; (7)~~(6)~~ Excessive wear, broken wires, stretch, kinking, or twisting of ropes and rope slings, including end connections. (A) See §5036(d) for additional requirements for cranes in construction. (8) Wire rope reeving for compliance with the manufacturer's specifications. ***	
(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. (D) Improperly applied end connections. (E) Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	5036(a) Apparent deficiencies. (1) Category I. Apparent deficiencies in this category include the following: (A) Significant distortion of the wire rope structure such as kinking, crushing, un-stranding, bird-caging, signs of core failure or steel core protrusion between the outer strands. (B) Significant corrosion. (C) Electric arc damage (from a source other than power lines) or heat damage. (D) Improperly applied end connections. (F) Significantly corroded, cracked, bent, or worn end connections (such as from severe service).	Similar to 5031(c)(2) Notes 3, 6 (amended with federal verbiage) and note 7.
(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	(2) 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	Compare with 5031(c)(2).

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lay, where a rope lay is the length along the rope in which one strand makes a complete revolution around the 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.	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.	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.	Compare with 5031(c)(2) Note 1.5.
(B) A diameter reduction of more than 5% from nominal diameter.	(B) A diameter reduction of more than 5% from nominal diameter.	Federal verbiage. State 5031(c)(2) Notes 1.4 and 1.6, are similar; however, federal verbiage is more specific and more restrictive.
(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.	(3) 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.	No current state counterpart.
(3) Critical review items. The competent person must give particular attention to all of the following: (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.	(b) Critical review items. The qualified person shall give particular attention to all of the following: (1) Rotation resistant wire rope in use. (2) Wire rope being used for boom hoists and luffing hoists, particularly at reverse bends. (3) Wire rope at flange points, crossover points and repetitive pickup points on drums. (4) Wire rope at or near terminal ends. (5) Wire rope in contact with saddles, equalizer sheaves or other sheaves where rope travel is limited.	

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(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.	(c) Removal from service. (1) If a deficiency in Category I [see section (a)(1)] is identified, an immediate determination shall be made by a competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, operations involving use of the wire rope in question shall be prohibited until: (A) The wire rope is replaced, or (B) If the deficiency is localized, the problem may be corrected by severing the wire rope in two; the undamaged portion may continue to be used. Joining lengths of wire rope by splicing is prohibited. If a rope is shortened under this subsection, the employer 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 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.	(2) If a deficiency in Category II [see section (a)(2)] is identified, operations involving use of the wire rope in question shall be prohibited until: (A) The employer complies with the wire rope manufacturer's established criterion for removal from service or a different criterion that the wire rope manufacturer has approved in writing for that specific wire rope, (B) The wire rope is replaced, or (C) If the deficiency is localized, the problem may be 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	

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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.	subsection, 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.	(3) If a deficiency in Category III is identified, operations involving use of the wire rope in question shall be prohibited until: (A) The wire rope is replaced, or (B) If the deficiency (other than power line contact) is localized, the problem may be 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 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 that wire rope must be tagged-out, in accordance with § 1926.1417(f)(1), until the wire rope is repaired or replaced.	(4) Where a wire rope is required to be removed from service under this section, either the equipment (as a whole) or the hoist with that wire rope shall be tagged-out, in accordance with §5008.1(e)(1), until the wire rope is repaired or replaced.	
(b) Monthly inspection. (1) Each month an inspection must be conducted in accordance with paragraph (a) (shift inspection) of this section.	(e) Monthly inspection. (1) Each month an inspection shall be conducted in accordance with section 5031(a).	
(2) The inspection must include any deficiencies that the qualified person who conducts the annual inspection determines	(2) The inspection shall include any deficiencies that the certificating agency that conducts the annual inspection determines	

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under paragraph (c)(3)(ii) of this section must be monitored.	under subsection (f)(3)(B) shall 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.	(3) Wire ropes on equipment shall not be used until an inspection under this subsection demonstrates that no corrective action under section 5036(c) is required.	
(4) The inspection must be documented according to § 1926.1412(e)(3) (monthly inspection documentation).	(4) The inspection shall be documented according to §5031(b)(3)(C) (monthly inspection documentation).	
(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).	(f) Annual/comprehensive. (1) At least every 12 months, wire ropes in use on equipment shall be inspected by a certificating agency in accordance with section 5036(d) (shift inspection).	*Review inspector qualifications with AC.*
(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.	(2) In addition, at least every 12 months, the wire ropes in use on equipment shall be inspected by a certificating agency, as follows: (A) The inspection shall be for deficiencies of the types listed in section 5036(a).	*Review inspector qualifications with AC.*
(ii) The inspection must be complete and thorough, covering the surface of the entire length of the wire ropes, with particular attention given to all of the following: (A) Critical review items listed in paragraph (a)(3) of this section. (B) Those sections that are normally hidden during shift and monthly inspections. (C) Wire rope subject to reverse bends. (D) Wire rope passing over sheaves.	(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: 1. Critical review items listed in section 5036(b). 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.	
(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	Exception: In the event an inspection under subsection (f)(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	

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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.	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.	(3) If a deficiency is identified, an immediate determination shall be made by the certificating agency as to whether the deficiency constitutes a safety hazard.	*Review inspector qualifications with AC.*
(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.	(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.	
(ii) If the qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections.	(B) 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 monthly 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 §5031(c)(8) (annual/ comprehensive inspection documentation).	
(d) Rope lubricants that are of the type that hinder inspection must not be used.	(g) Rope lubricants that are of the type that hinder inspection shall not be used.	
(e) All documents produced under this section	(h) All documents produced under this section	

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must be available, during the applicable document retention period, to all persons who conduct inspections 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.	**§5037. 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. (2) Option (2). Wire rope must be designed to have, in relation to the equipment's rated capacity, a sufficient minimum breaking force and design factor so that compliance with the applicable inspection provisions in § 1926.1413 will be an effective means of preventing sudden rope failure.	(b) Wire rope design criteria: Wire rope (other than rotation resistant rope) shall comply with either Option (1) or Option (2), as follows: (1) Option (1). Wire rope shall comply with section 5–1.7.1 of ASME B30.5–2004 except that section 5-1.7.1(c) shall not apply. (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 §5031 and §5036 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	(d) Boom hoist reeving. (1) Fiber core ropes shall not be used for boom	

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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.	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 three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(B) Type II rotation resistant wire rope ("Type II"). Type II rotation resistant rope is stranded rope constructed to have significant resistance to rotation. It has at least 10 outer strands and comprises an assembly of two or more layers of strands laid helically over a center in two or three operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	
(iii) Type III rotation resistant wire rope (''Type III''). Type III rotation resistant rope is stranded rope constructed to have limited resistance to rotation. It has no more than nine outer strands, and comprises an assembly of two layers of strands laid helically over a center in two operations. The direction of lay of the outer strands is opposite to that of the underlying layer.	(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.	

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(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 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	(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 accordance with subsections 5036(a) through (d) and 5031(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	

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considered by the qualified person in determining whether to use the rope again.	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: (A) The drum must provide a first layer rope pitch diameter of not less than 18 times the nominal diameter of the rope used. (B) The requirements in § 1926.1426(a) (irrespective of the date of manufacture of the equipment), and § 1926.1426(b). (C) The requirements in ASME B30.5–2004 sections 5–1.3.2(a), (a)(2) through (a)(4), (b) and (d) (incorporated by reference, see § 1926.6) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5–1.3.2(d)). (D) All sheaves used in the boom hoist reeving system must 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	(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: 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 §5002.1(a) (irrespective of the date of manufacture of the equipment), and §5002.1(b). 3. The requirements in ASME B30.5–2004 sections 5-1.3.2(a), (a)(2) through (a)(4), (b) and (d) except that the minimum pitch diameter for sheaves used in multiple rope reeving is 18 times the nominal diameter of the rope used (instead of the value of 16 specified in section 5-1.3.2(d)). 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	

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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.	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 dead-ending rope in a wedge socket is permitted.	(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 dead-ending 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.	(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 must be placed on each side of the point to be cut. The length and number of seizings must be in accordance with the wire rope manufacturer's instructions.	(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 instructions.	
§ 1926.1415 Safety devices.	**§5017. Safety devices.**	
(a) Safety devices. The following safety devices are required on all equipment covered by this subpart, unless otherwise specified: (1) Crane level indicator. (i) The equipment 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	(a) Safety devices. The following safety devices are required on all cranes and derricks in construction covered by Group 13, unless otherwise specified: (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	*See also Section 4924(e).* *[Ed note: although some of the federal subjects are covered by state as noted below, the state requirements are not as comprehensive, thus Art. 98.2 has been added.]*

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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.	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.	
(2) Boom stops, except for derricks and hydraulic booms.	(2) Boom stops, except for derricks and hydraulic booms.	*See also section 4922*
(3) Jib stops (if a jib is attached), except for derricks.	(3) Jib stops (if a jib is attached), except for derricks.	*No direct T8 counterpart.*
(4) Equipment with foot pedal brakes must have locks.	(4) Equipment with foot pedal brakes shall have locks.	*[4899, 4900, 4930]*
(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.	*See 4954 for hydraulic cranes*
(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.	*4903 for travel limit.*
(7) Horn (i) The equipment must have a horn that is either built into the equipment or is on the equipment and immediately available to the operator. (ii) If a built-in horn is not working properly, it must be tagged-out or removed. If a removable horn is not working properly, it must be removed.	(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. (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.	*[4889, 4936]*
(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	(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	

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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.	order, the equipment shall be taken out of service and operations shall not resume until the device is again working properly. Alternative measures are not permitted to be used.	
§ 1926.1416 Operational aids.	**§5018. 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 cranes and derricks in construction covered by Group 13, 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 July 7, 2012.	Effective date is brought forward from CSO 1615.2(a)(2) where these provisions previously resided.
(b) Operations must not begin unless the listed operational aids are in proper working order, except where an operational aid is being repaired the employer uses the specified temporary alternative measures. The time periods permitted for repairing defective operational aids are specified in paragraphs (d) and (e) of this section. More protective alternative measures specified by the crane/ derrick manufacturer, if any, must be followed.	(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 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	(c) If a listed operational aid stops working properly during operations, the operator shall safely stop operations until the temporary alternative measures are implemented or the device is again working properly. If a replacement part is no longer available, the use	Board staff proposed modification. 1610.6 formerly did not permit non-specified alternatives. Board staff proposes to modify to permit substitute (non-specified) alternatives subject to approval by manufacturer or certificating agency, and subject to conditions

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of a substitute device that performs the same type of function is permitted and is not considered a modification under § 1926.1434.	of a substitute device that performs the same type of function is permitted subject to the provisions of §4884.1.	of 1926.1434.
(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 and alternative measures. 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 §5008.1(g) for additional requirements.	*Question for AC: Existing 1619.2(e) and Proposed 4968.2(e) for tower cranes do not permit operation if Cat I operational aids stop working. Should the same restriction apply for other cranes?*
(1) Boom hoist limiting device. (i) For equipment manufactured after December 16, 1969, a boom hoist limiting device is required. Temporary alternative measures (use at least one). One or more of the following methods must be used: (A) Use a boom angle indicator. (B) Clearly mark the boom hoist cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to keep the boom within the minimum allowable radius. In addition, install mirrors or remote video cameras and displays if necessary for the operator to see the mark. (C) Clearly mark the boom hoist cable (so that it can easily be seen by a spotter) at a point that will give the spotter sufficient time to signal the operator and have the operator stop the hoist to keep the boom within the minimum allowable radius.	(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: 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.	

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(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. through (d)(1)(A)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 paragraph (d)(1)(A) of this section, except to limit the movement of the luffing jib rather than the boom hoist.	
(3) Anti two-blocking device. (i) Telescopic boom cranes manufactured after February 28, 1992, must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur.	(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 device(s) shall prevent such damage at all points where two-blocking could occur.	*[See 4924(d)(1)]* (review for recombine)
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	(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	*Relocated from 4924d2 (check differences between fed and state)*

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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.	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 July 7, 2012 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.	
(C) Exception. The requirements in paragraphs (d)(3)(ii)(A) and (B) of this section do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, marine operations that do not involve hoisting personnel, and pile driving work.	Exception. The requirements in subsections (d)(3)(B)1 and 2 do not apply to such lattice boom equipment when used for dragline, clamshell (grapple), magnet, and drop ball work that do not involve hoisting personnel.	The CA exception is more limited than the federal exception. (See GISO 4924d2 Exception)
(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.		*Shall California 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	(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	Ed note: Fed amended with verbiage from 4924(d)(3). *Note that fed effective date is earlier than state (Aug 30, 2001).*

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two-blocking could occur.	damage at all points where two-blocking could occur.	
Temporary alternative measures: When two-blocking could only occur with movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter. When two-blocking could occur without movement of the load hoist, clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter when extending the boom.		*Shall California 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 the deficiency occurs.	(e) Category II operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly shall be repaired no later than 30 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. See § 1926.1417(j) for additional requirements.	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 §5008.1(g) for additional requirements.	*Is the federal exception too permissive?*
(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	(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	Relocated from GISO 4924(c) except amended to apply to all cranes; not just mobile.

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radii or boom angle with a measuring device.	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.	
(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: When a jib angle or radius indicator is inoperative or malfunctioning, a qualified person shall determine the main boom angle and then measuring the radii or jib angle with a measuring device.	Amended with GISO 4924(c) exception *[AC review requested]*
(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length. Temporary alternative measures. One or more of the following methods must be used: (i) Mark the boom with measured marks to calculate boom length, (ii) Calculate boom length from boom angle and radius measurements, (iii) Measure the boom with a measuring device.	(3) Boom length indicator if the equipment has a telescopic boom, except where the rated capacity is independent of the boom length. Temporary alternative measures. One or more of the following methods 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. All mobile cranes including truck-mounted tower cranes having either a maximum rated boom length exceeding 200 feet or a maximum rated capacity exceeding 50 tons shall be equipped with a load indicating device or a load moment device, or a device that prevents an overload condition. Only approved devices as defined in the General Industry Safety Orders,	Relocate 4924(b) to 5018(e)(4)

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	Section 3206 shall be used.	
(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.	(A) All other mobile cranes manufactured after March 29, 2003 ~~September 27, 2005~~, with a maximum rated capacity exceeding 3 tons shall be equipped with a load indicating device, load moment device, or a device that prevents an overload condition.	*Effective date of 4924(b)(1) changed to be consistent with federal.*
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.	Exception: When installed load indicating devices are not functional, a qualified person shall determine load weights until the device is restored to operation. The weight of the load shall be determined from a source recognized by the industry (such as the load's manufacturer) or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight). This information shall be provided to the operator prior to the lift. (B) Load indicating devices shall be repaired in accordance with the manufacturer's recommendations.	*4924(b)(1) Exception relocated and amended with federal verbiage.*
(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.	4884(c)(2) Articulating boom cranes manufactured after May 16, 1993 shall conform to these regulations and be provided with a permanently attached metal label stating that the equipment has been designed and constructed in accordance with ASME/ANSI B30.22-1987, and B30.22a-1988 Addenda, Articulating Boom Cranes, herein incorporated by reference, or has been approved as required by the provisions of Section 3206 of these orders.	

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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.		Articulating cranes are covered by 4924(b) [above] which includes the temporary measures described here.
(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 July 7, 2012: (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.	Federal amended with CSO 1615.2(e)(5) (state) effective date.
(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.	**§5008.1 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.	

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(b) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer must develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls must be developed by a qualified person. (3) Procedures related to the capacity of the equipment must be developed and signed by a registered professional engineer familiar with the equipment.	(d) Unavailable operation procedures. (1) Where the manufacturer procedures are unavailable, the employer shall develop and ensure compliance with all procedures necessary for the safe operation of the equipment and attachments. (2) Procedures for the operational controls 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.	Federal verbiage except that "qualified person" and "registered professional engineer" are replaced with "certified agent," consistent with GISO 4965 and definitions in section 4885.
(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.	(b) Accessibility of procedures. The procedures, written in English, applicable to the operation of the equipment, including rated capacities (load charts), recommended operating speeds, special hazard warnings, instructions, and operator's manual, shall be readily available in the cab at all times for use by the operator.	Fed verbiage adopted – similar to 4965(b) which applies only to tower cranes.
	(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(c) which applies only to tower cranes. It will be incorporated in section 5008.1 for general applicability.
(2) Where rated capacities are available in the cab only in electronic form: In the event of a	(2) Where rated capacities are available in the cab only in electronic form: In the event of a	Adopt federal

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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.	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.	
(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).	(c) 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
(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.	5008 Operating Practices. *** (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.	1926.1417(e) is covered jointly by 4999(i) and 5008(e) [this row and next]
(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	4999 Handling Loads. *** (i) Holding the Load. (1) When a load of any kind is to be suspended for a period of time exceeding normal lifting operations ~~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	

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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.	the load is suspended over water, a barricaded area, or is blocked up or otherwise supported from below during repairs or emergency.	
(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) and "Load" which is defined by 4885 as: "The external load in pounds applied on the hoisting line, including the weight of load attaching equipment such as load blocks, shackles, slings, buckets, and magnets." [emphasis added]
(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.	5008.1(e) 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 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	(B) If there is a warning (tag-out or	Modified federal verbiage. CA Lock-out Tag-

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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.	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 Section 3314.	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.	5008(f) Before closing the switch or starting the engine, all controls shall be in the "off" position and all personnel in the clear.	
(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.]	5008.1(f) 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.	5008.1(g) 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.]	(h) Safety devices and operational aids shall not be used as a substitute for the exercise of professional judgment by the operator.	*[Ed note: is this enforceable?]*
(m) If the competent person determines that there is a slack rope condition requiring re-spooling of the rope, it must be verified (before	4999(a) The qualified person (rigger) shall be trained and capable of safely performing the rigging operation. All loads shall be rigged by a	A qualified person (rigger) has responsibility.

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starting to lift) that the rope is seated on the drum and in the sheaves as the slack is removed.	qualified person (rigger) or by a trainee under the direct visual supervision of a qualified person (rigger). *** (e) Before Starting to Hoist: *** (4) If there is a slack rope condition, the rope shall be properly seated on the drum and in the sheaves.	
(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.	5008.1(i) 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.	*[Ed note: should this be "qualified person," or "competent person" or…?]*
(o) Compliance with rated capacity. (1) The equipment must not be operated in excess of its rated capacity. (2) The operator must not be required to operate the equipment in a manner that would violate paragraph (o)(1) of this section.	4999(b) Size of Load. A crane, derrick, or hoist shall not be loaded beyond the rated capacity ~~or safe working load whichever is smaller,~~ except for test purposes.	
(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:	4999(b) Size of Load. A crane, derrick, or hoist shall not be loaded beyond the rated capacity ~~or safe working load whichever is smaller,~~ except for test purposes. The operator shall verify that the load is within the rated capacity of the equipment by at least one of the following methods: ~~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~~	GISO 4999(b) amended to comply with federal.

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	~~weight by the qualified person (rigger) assigned to that operation.~~	
(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	(1) The weight of the load shall be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. In addition, when requested by the operator, this information shall be provided to the operator prior to the lift; 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.	(2) The operator may begin hoisting the load to determine, using a load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter, if it exceeds 75 percent of the maximum rated capacity at the longest radius that will be used during the lift operation. If it does, the operator shall not proceed with the lift until he/she verifies the weight of the load in accordance with subsection (b)(1).	
(p) The boom or other parts of the equipment must not contact any obstruction.	4999(f) During Hoisting: *** (2) The load, boom, or other parts of the equipment shall not contact any obstruction in a way which could cause falling material or damage to the boom.	
(q) The equipment must not be used to drag or pull loads sideways.	4999(g) 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.	
(r) On wheel-mounted equipment, no loads	4999(k) On ~~truck~~ wheel-mounted cranes, no	

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must be lifted over the front area, except as permitted by the manufacturer.	loads shall be lifted over the front area except as permitted by the manufacturer ~~approved by the certified agency~~.	
(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.	4994(c) ~~The brakes shall be tested each time a load approaching the rated load is handled by raising the load a few inches and applying the brakes.~~ 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.	Adopt federal.
(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.	4999(d) 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	4991 Travel (a) 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. (b) In transit, the following additional precautions for mobile cranes shall be exercised: (1) The boom shall be carried in line with the direction of motion and the superstructure shall be secured against rotation, except when	Federal verbiage added as subsections (c) and (d). Federal (u)(2)(ii) is redundant.

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specified by the manufacturer is maintained.	negotiating turns when there is an operator in the cab, or when the boom is supported on a dolly. (2) The empty hook, headache ball, or block shall be lashed or otherwise restrained so that it cannot swing freely. (c) Traveling with a load is prohibited if the practice is prohibited by the manufacturer. (d) Where traveling with a load, the employer shall ensure that: (1) 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. (2) For equipment with tires, tire pressure specified by the manufacturer shall be maintained.	
(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.	4993(a) 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.	
(w) A tag or restraint line must be used if necessary to prevent rotation of the load that would be hazardous.	4993(b) Tag or restraint lines shall be used where rotation of the load is hazardous.	
(x) The brakes must be adjusted in accordance with manufacturer procedures to prevent unintended movement.	§5034. Adjustments and Repairs. *** (d) Adjustments shall be maintained to assure correct functioning of the following components: *** (5) Brakes.	

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(y) The operator must obey a stop (or emergency stop) signal, irrespective of who gives it.	5001. Signals. (b) Only qualified persons shall be permitted to give signals. EXCEPTION: A stop signal may be given by any person. *** §5008. Operating Practices. (b) The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal at any time.	
(z) Swinging locomotive cranes. A locomotive crane must not be swung into a position where railway cars on an adjacent track could strike it, until it is determined that cars are not being moved on the adjacent track and that proper flag protection has been established.	4993(d) A locomotive crane shall not be swung into a position where railway cars on an adjacent track might strike it, until it has been ascertained that cars are not being moved on the adjacent track and 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).	5008.1(j) 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 §4966(i)(8).	
§ 1926.1418 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.	5008(c) Whenever the operator doubts the safety of a movement, the operator shall have authority ~~be authorized~~ to stop the hoisting operation until a qualified person has	

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	determined that safety has been assured.	
§ 1926.1419 Signals—general requirements.	**§5001. 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) When the point of operation meaning the load travel or the area near or at load placement, is not in full and direct view of the operator unless a signaling or control device is provided for safe direction 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.	Existing state amended with federal.
(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" in the context used in the federal standards would require 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) ~~(c)~~ 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 Plate I.)	
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 Standard Method, 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	(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	

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will be used.	will be used.	
	(3) ~~(e)~~ There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.	
(d) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or (2) 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) New signals. Signals other than hand, voice, or audible signals may be used where the employer demonstrates that: (1) The new signals provide at least equally effective communication as voice, audible, or Standard Method hand signals, or (2) The new signals comply with a national consensus standard that provides at least equally effective communication as voice, audible, or Standard Method hand signals.	*Note to AC: review "new signals" – shall their use be permitted with or without a variance.*
(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.	(f) 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.), 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.	(g) 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) ~~(d)~~ 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.	(g)(1) copied from GISO 5001(d) which supplements the federal standard.

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(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.	(h) 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.] (j) Anyone who becomes aware of a safety problem must alert the operator or signal person by giving the stop or emergency stop signal. (Note: § 1926.1417(y) requires the operator to obey a stop or emergency stop signal).	§5001. Signals. *** (b) Only qualified persons shall be permitted to give signals. EXCEPTION: A stop signal may be given by any person. === §5008. Operating Practices. *** (b) The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal at any time.	
(k) All directions given to the operator by the signal person must be given from the operator's direction perspective. (l) [Reserved.]	§5001(i) All directions given to the operator by the signal person must 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.	§5001(j) 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.	

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§ 1926.1420 Signals—radio, telephone or other electronic transmission of signals.	§5001.1. 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. (b) Signal transmission must be through a dedicated channel, except: (1) Multiple cranes/derricks and one or more signal persons may share a dedicated channel for the purpose of coordinating operations. (2) Where a crane is being operated on or adjacent to railroad tracks, and the actions of the crane operator need to be coordinated with the movement of other equipment or trains on the same or adjacent tracks. (c) The operator's reception of signals must be by a hands-free system.	(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 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 the movement of other equipment or trains on the same or adjacent tracks. (c) The operator's reception of signals shall be by a hands-free system.	
§ 1926.1421 Signals—voice signals—additional requirements.	§5001.2. 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,	(b) Each voice signal shall contain the following three elements, given in the following order: (1) function (such as hoist, boom, etc.) and direction; (2) distance and/or	*AC: Note clarifications made to 3 elements. Are they correct; do they help?*

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stop command.	speed; (3) function and 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.	**§5001. Signals – General requirements.**	
Hand signal charts must be either posted on the equipment or conspicuously posted in the vicinity of the hoisting operations.	(3) ~~(e)~~ There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.	
§ 1926.1423 Fall protection.	**§5011. Fall protection – additional/specific requirements for cranes.**	
(a) Application. (1) Paragraphs (b), (c)(3), (e) and (f) of this section apply to all equipment covered by this subpart except tower cranes. (2) Paragraphs (c)(1), (c)(2), (d), (g), (j) and (k) of this section apply to all equipment covered by this subpart. (3) Paragraphs (c)(4) and (h) of this section apply only to tower cranes.	(a) Application. (1) Subsections (b), (c)(3), (e) and (f) apply to all equipment covered by Group 13 except tower cranes. (2) Subsections (c)(1), (c)(2), (d), and (g), apply to all equipment covered by Group 13. (3) Subsections (c)(4) 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) Boom walkways. (1) Equipment manufactured after July 7, 2012 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 walkways are: 1. Not required.	Effective date is from CSO 1610.7(b)(1) (existing requirement)

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(B) Prohibited on booms supported by pendant ropes or bars if the guardrails/railings/ attachments could be snagged by the ropes or bars. (C) Prohibited if of the removable type (designed to be installed and removed each time the boom is assembled/disassembled). (D) Where not prohibited, guardrails or railings may be of any height up to, but not more than, 45 inches.	2. 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 Sections 3209 and 3210.	
(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. (1) Sections 3209 and 3210 (guardrails) do not apply to equipment covered by General Industry Safety Orders, Group 13.	
(2) The employer must maintain in good condition originally-equipped steps, handholds, ladders and guardrails/railings/grabrails.	(2) The employer shall maintain in good condition originally-equipped steps, handholds, 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	(3) Equipment manufactured after July 7, 2012 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	Effective date is from CSO 1610.7(c)(2) (existing requirement)

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features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	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 reference, see § 1926.6) except where infeasible. (ii) Walking/stepping surfaces must have slip-resistant features/properties (such as diamond plate metal, strategically placed grip tape, expanded metal, or slip-resistant paint).	(4) Tower cranes manufactured after July 7, 2012 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 infeasible. (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 and fall restraint systems shall conform to the requirements of CSO Article 24, Fall Protection.	CSO Article 24 is a horizontal standard for fall protection. Body belts are not permitted for use in fall arrest systems.
(e) For non-assembly/disassembly work, the	(e) For non-assembly/disassembly work, the	*Ed comment: (e)(1)(iii) was changed to an*

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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.	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. EXCEPTION: On horizontal lattice booms where the fall distance is less than 15 feet. (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.	*exception as it is confusing in the federal verbiage (is the trigger height 6' or 15' for horizontal lattice booms?)*
(f) For assembly/disassembly work, the employer must provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (when the equipment is running), in the cab, or on the deck.	(f) For assembly/disassembly work, the employer shall provide and ensure the use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level, except when the employee is at or near draw-works (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	(g) Anchorage criteria. Anchorages for personal fall arrest, positioning device systems and fall restraint systems shall comply with the provisions of CSO Section 1670.	*1926.502(d)(15) and 1926.502(e)(2) are less protective than CA standards.*

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a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(d)(15) would not be met. (ii) Positioning device systems must be anchored to any apparently substantial part of the equipment unless a competent person, from a visual inspection, without an engineering analysis, would conclude that the criteria in § 1926.502(e)(2) would not be met. (iii) Attachable anchor devices (portable anchor devices that are attached to the equipment) must meet the anchorage criteria in § 1926.502(d)(15) for personal fall arrest systems and § 1926.502(e)(2) for positioning device systems. (3) Anchorages for fall restraint systems. Fall restraint systems must be anchored to any part of the equipment that is capable of withstanding twice the maximum load that an employee may impose on it during reasonably anticipated conditions of use.		
(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	(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	

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employees who are on a walking/working surface with an unprotected side or edge more than 15 feet above a lower level. (i) [Reserved.]	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. (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).		This practice is not allowed in CA.
(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.	**§4993.1. 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	(a) Swing radius hazards. (1) The requirements of this section apply where there are accessible areas in which the equipment's rotating superstructure poses a	

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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.	hazard of: (A) Striking and injuring an employee; or (B) Pinching/crushing an employee against another part of the equipment or another object.	
(2) To prevent employees from entering these hazard areas, the employer must: (i) Train each employee assigned to work on or near the equipment (''authorized personnel'') in how to recognize struck-by and pinch/crush hazard areas posed by the rotating superstructure. (ii) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. Exception: When the employer can demonstrate that it is neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas must be clearly marked by a combination of warning signs (such as ''Danger—Swing/ Crush Zone'') and high visibility markings on the equipment that identify the hazard areas. In addition, the employer must train each employee to understand what these markings signify.	(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. (B) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas. EXCEPTION: When the employer can demonstrate that it is not feasible to erect such barriers on the ground or 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. The markings shall be visible to employees from outside the hazard area. In addition, the employer shall train each employee to understand what these markings signify.	Training is covered by 3203(a)(7)
(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.	(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 shall inform the operator that he/she is going to that location.	

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(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.	(B) When the operator has been informed of employee entry to a location covered by subsection (a)(1), the operator shall not rotate the superstructure until the operator is informed by the employee or visually confirms that the employee has exited the location and 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) Where any part of a crane/derrick is within the load radius of another crane/derrick, the controlling entity shall institute a system to coordinate operations. If there is no controlling entity, the employer (if there is only one employer operating the multiple pieces of equipment) shall institute such a system.	
§ 1926.1425 Keeping clear of the load.	**§5002. Overhead Loads.**	
(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.~~	*Note will be replaced by new subsections below.*
(b) While the operator is not moving a suspended load, no employee must be within the fall zone, except for employees: (1) Engaged in hooking, unhooking or guiding a load; (2) Engaged in the initial attachment of the load to a component or structure; or	(b) While the operator is not moving a suspended load, no employee shall be within the fall zone. Exceptions: (1) Employees engaged in hooking, unhooking or guiding a load; (2) Employees engaged in the initial attachment of the load to a component or structure; or	*Modified for clarity.*

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(3) Operating a concrete hopper or concrete bucket.	(3) Employees 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. Exception: ''J'' hooks are permitted to be used for setting wooden trusses.	(2) Hooks with self-closing latches or their equivalent shall be used.	*Self-closing hooks also covered in 5002(a). Review J-hook exception (not currently allowed by T8).*
(3) The materials must be rigged by a qualified rigger.	(3) 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 fall zone when a load is being landed.	(d) Receiving a load. Only employees needed to receive a load are permitted to be within the fall zone when a load is being landed.	
(e) During a tilt-up or tilt-down operation: (1) No employee must be directly under the load. (2) Only employees essential to the operation are permitted in the fall zone (but not directly under the load). An employee is essential to the operation if the employee is conducting one of the following operations and the employer can demonstrate it is infeasible for the employee to perform that operation from outside the fall zone: (1) Physically guide the load; (2) closely monitor and give instructions regarding the load's movement; or (3) either detach it from or initially attach it to another component or structure (such as, but not limited to, making an initial connection or installing bracing).	(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	*AC review (e)(2): Is it necessary to permit employees under the load during tilt-up?*

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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.	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 §5002.1.	
§ 1926.1426 Free fall and controlled load lowering.	**§5002.1. 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. (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.	(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. (C) The load or boom is directly over a power line, or over any part of the area extending the Table A of §5003.1 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. Note to (a)(1)(C): Operations in proximity to overhead lines are also subject to Section 2946. (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.	*AC: any comments on boom free fall?*
(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted	(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted	

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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.	only where none of the circumstances listed in paragraph (a)(1) of this section 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: (1) Friction drums must have: (i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (ii) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart. (4) Hydraulic boom cylinders must have an integrally mounted holding device.	(b) Preventing boom free fall. Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited, the boom hoist must have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows: (1) Friction drums must have: (A) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering. (B) A secondary braking or locking device, which is manually or automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device). (2) Hydraulic drums must have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure. (3) Neither clutches nor hydraulic motors must be considered brake or locking devices for purposes of this subpart. (4) Hydraulic boom cylinders must have an integrally mounted holding device.	
(c) Preventing uncontrolled retraction. Hydraulic telescoping booms must have an integrally mounted holding device to prevent	(c) Preventing uncontrolled retraction. Hydraulic telescoping booms shall have an integrally mounted holding device to prevent	*Similar to 4949(d)*

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the boom from retracting in the event of hydraulic failure.	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 there are no employees in the fall zone of the load.	(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 §5003.1 clearance distance to each side of the power line; or any part of the area extending the Table A of §5003.1 clearance distance to each side of the power line is within the radius of vertical travel of the load. Note to (d)(3): Operations in proximity to overhead lines are also subject to Section 2946. (4) The load is over a shaft. (5) The load is over a cofferdam, except where there are no employees in the fall zone of the load.	
§ 1926.1427 Operator qualification and certification.	**§5006. Crane and Hoisting Equipment Operators – Qualifications.**	1926.1427 applies to cranes and derricks in construction. State section 5006.2 is the state counterpart.
	*** Exceptions: *** 2. Cranes in construction regulated by Section 5006.2.	
	§5006.2. Operator Qualification and Certification (for Cranes and Derricks in Construction).	
(a) The employer must ensure that, prior to	(a) Qualifications and Certification. The	

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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:	employer shall ensure that, prior to operating any equipment covered under Group 13, 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:	
(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	(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) of this section, the equipment operator shall be licensed by that government entity for operation of equipment within that entity's jurisdiction.	
(ii) qualified in compliance with paragraph (d) of this section.		(a)(1)(ii) which refers to subsection (d) Option (3): Qualification by the U.S. military, 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.	(2) Where subsection (a)(1) of this section is not applicable, the certification or qualification shall comply with subsection (b).	Federal option 2 not permitted in CA and federal option 3 is not applicable in CA.
(3) Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see § 1926.1436), sideboom cranes (see § 1926.1440), or equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441).	EXCEPTIONS TO SECTION 5006.2: (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 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	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.

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	rated load capacity of less than 15,000 pounds.	
(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.	5006.2(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 July 7, 2011.	July 7, 2011 is the CA effective date (copied from 1618.1(a)(3) [previously approved by OSHA]
(b) Option (1): Certification by an accredited crane operator testing organization.	5006.2(b) Option (1): Certification by an accredited crane operator certifying entity.	Copied from 1618.1(b)
(1) For a testing organization to be considered accredited to certify operators under this subpart, it must:	5006.2(b)(3) Accredited Certifying Entity. A certifying entity is any organization whose certification program complies with the requirements of section 5006.1(c).	See 5006.1(c) – next row.
(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.	5006.1(c) 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.	
(ii) Administer written and practical tests that: (A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (B) Provide different levels of certification based on equipment capacity and type.	5006.1(a) Qualifications. The employer shall only permit operators who have a valid certificate of competency (certificate) issued in accordance with this section by an Accredited Certifying Entity for the type of crane to be used to operate a crane covered by this section. Certificates shall be issued to operators who: *** (3) Pass a written examination developed, validated, and administered in accordance with the Standards for Educational and Psychological Testing (Copyright 1999)	5006.2(b) requires compliance with 5006.1(a)

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	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: (A) operational characteristics and controls, including characteristic and performance questions appropriate to the crane type for which qualification is sought; (B) emergency control skills, such as a response to fire, power line contact, loss of stability, or control malfunction; (C) 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) Pass a "hands-on" examination to 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.	5006.2(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.	
(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.	5006.2(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).	5006.2(b)(1) encompasses all the requirements of 1926.1427(j)(1) and (2).
(v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.	5006.2(b)(3)(A) The accredited certifying entity shall have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.	

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(2) An operator will be deemed qualified to operate a particular piece of equipment if the operator is certified under paragraph (b) of this section for that type and capacity of equipment or for higher-capacity equipment of that type. If no accredited testing agency offers certification examinations for a particular type and/or capacity of equipment, an operator will be deemed qualified to operate that equipment if the operator has been certified for the type/capacity that is most similar to that equipment and for which a certification examination is available. The operator's certificate must state the type/capacity of equipment for which the operator is certified.	5006.2(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 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.	5006.2(b)(2)(B) A certification issued under this option (Option 1) is portable.	
(4) A certification issued under this paragraph is valid for 5 years.	5006.2(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).	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		Federal Option 2, Employer certification, is permissible in CA subject to the same requirements as in 5006.2(b) [Option 1] above. CA doesn't offer the Federal Option 2.

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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 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		

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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. (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		Option 3 is not applicable: CA does not have jurisdiction over work conducted on military installations.

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considered qualified if he/she has a current operator qualification issued by the U.S. military for operation of the equipment. An employee of the U.S. military is a Federal employee of the Department of Defense or Armed Forces and does not include employees of private contractors. (2) A qualification under this paragraph is: (i) Not portable. Such a qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the 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.	5006.2(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) are met. (2) Licensing criteria. (A) The requirements for obtaining the license include passing a physical examination and a substance abuse test as prescribed in section 5006.1(a)(1) and (2), and an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in section 5006.1(a)(3) and (4) as supplemented by subsection (b)(1) of this section.	*CalTrans exception*
(ii) The testing meets industry recognized	(B) The testing meets industry recognized	

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criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel. (iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i) and (ii) of this section have been met. (iv) The licensing department/office has testing procedures for re-licensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section.	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) 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 sections 5006.1(a)(3) and (4) supplemented by 5006.2(b)(1)(A) and (B).	
(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.	(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	5006.2(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	

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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.	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.	
(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:	(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.	(d)(3) copied from 5006.1(e). Necessary to copy GISO because of other qualifiers for construction.
(i) The operator's trainer is an employee or agent of the operator-in-training's employer.	(A) The operator's trainer shall be an employee or agent of the operator-in-training's employer.	(d)(3)(A) is fed verbiage from (3)(i).
(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.	5006.2(d)(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	Copied from 5006.1(e). Necessary to copy GISO because of other qualifiers for construction. CA more protective; the trainer must possess a valid certificate of competency.

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	crane by the trainee.	
(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.	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-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.		CA: the operator-in-training is not permitted to operate the equipment while the trainer is on break.
(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	5006.2(d)(3) (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 5003.1(a)(1)], could get within 20 feet of a	

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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.	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.	
(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.		Same entity doing training and testing is only permitted to the extent allowed by CA Option 2 above.
(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.		Written tests are required in CA (more protective).
(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	5006.1(a)(3) 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	The operator candidate must be able to read and comprehend the crane manufacturer's O&M materials.

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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.]	minimum, include the following: *** (C) 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;	
(j) Certification criteria. Qualifications and certifications must be based, at a minimum, on the following:	5006.2(b) Option (1): Certification by an accredited crane operator certifying entity. (1) Qualifications. The employer shall only permit operators who have a valid certificate of competency (certificate) issued in accordance with section 5006.1(a) supplemented by the following: 5006.1(a) Qualifications. The employer shall only permit operators who have a valid certificate of competency (certificate) issued in accordance with this section by an Accredited Certifying Entity for the type of crane to be used to operate a crane covered by this section. Certificates shall be issued to operators who: ***	
(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.	5006.1(a)(3) 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 following: (A) operational characteristics and controls, including characteristic and performance questions appropriate to the crane type for which qualification is sought; ***	
(B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.	(C) 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	

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	certification is sought;	
(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.	5006.2(b)(1)(A) The written examination required by 5006.1(a)(3) shall be supplemented to include: 1. Procedures for preventing and responding to power line contact. +++ 5006.1(a)(3) The exam shall test knowledge and skills identified as necessary for safe crane operations	
(E) Technical knowledge applicable to: (1) The suitability of the supporting ground and surface to handle expected loads. (2) Site hazards. (3) Site access.	5006.2(b)(1)(A) The written examination required by 5006.1(a)(3) shall be supplemented to include: *** 2. Technical knowledge applicable to: (i) The suitability of the supporting ground and surface to handle expected loads. (ii) Site hazards. (iii) Site access.	5006.1(a)(3) supplemented with federal (j)(1)(i)(C) and (E) for equivalency.
(F) This subpart, including applicable incorporated materials.	5006.1(a)(3) The exam shall test knowledge and skills identified as necessary for safe crane operations	
(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.	5006.1(a)(3)(C) 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;	
(2) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following: (i) Ability to recognize, from visual and auditory observation, the items listed in § 1926.1412(d) (shift inspection). (ii) Operational and maneuvering skills.	5006.2(b)(1)(B) The "hands-on" practical examination required by 5006.1(a)(4) shall be supplemented to include: 1. The ability to recognize, from visual and auditory observation, the items listed in Section 5031(a) (shift inspection). 2. The application of load chart information. ***	Use State verbiage for 5006.1(a) (4) amended with Fed requirements of (j)(2)(i) – (iv).

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(iii) Application of load chart information. (iv) Application of safe shut-down and securing procedures.	5006.1(a)(4) Pass a "hands-on" examination to 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.	
(k) Phase-in.	5006.2(e) Effective Dates and Phase-in. (1) Mobile and tower crane operator qualifications and certification (for cranes operating in construction) shall be in accordance with the provisions of General Industry Safety Orders, Section 5006.1 effective June 1, 2005, until July 7, 2015 at which time this section 5006.2 shall be fully applicable.	Retain 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 (5006.2) are applicable July 7, 2011, except for subsections (a)(2) [operator qualification and certification] and (d) [pre-qualification/certification training] which are applicable effective July 7, 2015.	July 7, 2011 and July 7, 2015 are existing effective dates brought forward from CSO 1618.1(e)
(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) The following requirements shall apply until July 7, 2015:	July 7, 2015 is the existing effective date brought forward from CSO 1618.1(e)
(i) The employer must ensure that operators of equipment covered by this standard are competent to operate the equipment safely. (ii) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employer must train that employee prior to operating the equipment. The employer must ensure that each operator is evaluated to confirm that he/she understands the information	(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 shall ensure that each operator is evaluated to confirm that he/she understands the information	

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provided in the training.	provided in the training.	
§ 1926.1428 Signal person qualifications.	**§5001.3. Signal person qualifications (for Cranes and Derricks in Construction).**	*Question for AC: shouldn't these requirements (5001.3) apply to GI also? i.e. should we strike "for Cranes and Derricks in Construction"?*
(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 section 4885, Qualified Evaluator (third party)], 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 evaluator [see section 4885, Qualified Evaluator (not a third party)], 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	

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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 paragraph (c) of this section.	
(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 paragraph (c) of this section), 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 paragraph (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 §5001 through §5001.3. (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.	

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§ 1926.1429 Qualifications of maintenance & repair employees.	**§5033.1. Qualifications of maintenance & repair employees.**	
(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.	(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: (A) Operate the equipment under the direct supervision of an operator who meets the requirements of §5006.1 or 5006.2 (Operator qualification and certification) as applicable; 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.	**§5012. Training – Additional Requirements for Cranes.**	
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).		1926.1408(g) [CA section 5003.1(f)] already spells-out the training requirements. This requirement is redundant. Additionally, Section 3203 also requires the employer to conduct training. 1926.1410(m) refers back to 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		1926.1428(c) [CA section 5001.3(c)] already spells-out the training requirements. Additionally, Section 3203 also requires the employer to conduct training.

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addressed in that paragraph.		
(c) Operators. (1) Operators-in-Training for equipment where certification or qualification is required by this subpart. The employer must train each operator-in-training in the areas addressed in § 1926.1427(j).		This requirement is redundant. Sections 5006.1 and 5006.2 require that training be conducted, including these specific topics and areas. Section 3203 also requires that training be conducted by the employer.
The employer must provide re-training if the operator-in-training does not pass a qualification or certification test.		This requirement is redundant; already covered by 5006.2(b)(4) and (b)(5).
(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).		This requirement is redundant; already covered by 5006.2(e)(3).
(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.		This requirement is redundant; already covered by 5006.2(a) and also by section 3203.
(4) The employer must train each operator of the equipment covered by this subpart in the following practices:	(a) The employer shall train each operator of the equipment covered by Group 13 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.	(1) 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. If the brake does not hold and cannot be adjusted to hold, the condition shall be repaired.	Same requirement; verbiage modified to be regulatory.

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See § 1926.1417(f) and (j) for additional requirements.	(A) See §5008.1(e) [tag-out] and 5008.1(g) [adjustments or repairs] for additional requirements.	
(ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.	(2) 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.		By definition, competent persons and qualified persons are required to be knowledgeable in these hazards.
(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).	§4993.1. Work Area Control. *** (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.	
(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).	§3314. The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, Including Lockout/Tagout. *** (j) Training. (1) Authorized employees shall be trained on hazardous energy control procedures and on the hazards related to performing activities required for cleaning, repairing, servicing, setting-up and adjusting prime movers, machinery and equipment. (2) Each affected employee shall be instructed	

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	in the purpose and use of the energy control procedure. (3) All other employees whose work operations may be in an area where energy control procedures may be utilized, shall be instructed about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.	
(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.	§3203. Injury and Illness Prevention Program.	California's IIPP covers all these requirements and more. It is too lengthy to include in this SXS but is available for viewing on the web.
§ 1926.1431 Hoisting personnel.	**§5004. Crane or Derrick Suspended Personnel Platforms.**	
The requirements of this section are supplemental to the other requirements in this subpart and apply when one or more employees are hoisted.	(a) Scope. These Orders apply to the design, construction, testing, use and maintenance of personnel platforms, and the hoisting of personnel platforms on load lines of cranes and derricks.	
(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,	(c) General Requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a	

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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.	personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.	
(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.	(k)(10) Use of personnel platform. When using equipment to hoist employees, the employees shall be in a personnel platform that meets the requirements of subsections (f) and (g) 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 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).	EXCEPTIONS: A personnel platform is not required for hoisting employees: 1. 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]. 2. In pile driving operations [see subsection (p) for requirements for hoisting these employees]. 3. 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]. 4. In storage-tank (steel or concrete), shaft 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	(d)(4) The crane shall be uniformly level within one percent of level grade, and located on firm footing. Cranes equipped with outriggers or stabilizers	

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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.	shall have them all fully deployed and locked following manufacturer's specifications, insofar as applicable, when hoisting employees.	
(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.	(d)(5) Capacity: (A) Use of suspended personnel platforms. The total weight of the loaded personnel platform and related rigging shall not exceed 50 percent of the rated capacity for the radius and configuration of the crane or derrick, except during proof testing.	Rigging includes load line and hook.
(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).	(B) Use of boom-attached personnel platforms. The total weight of the loaded personnel platform shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.	
(3) Capacity: Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to paragraph (b)(2) of this section, the total load (including the hook, load line, rigging and any other equipment that imposes a load) must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.	(C) Hoisting personnel without a personnel platform. When hoisting personnel without a personnel platform pursuant to section (k)(10) Exceptions, the total load (including the hook, load line, rigging and any other equipment that imposes a load) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.	
(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.	(d)(3) Load and boom hoist ~~drum~~ brakes, swing brakes, and operator actuated secondary braking and locking devices such as pawls or dogs or automatic secondary brakes shall be engaged when the occupied personnel platform is in a stationary working position.	
(5) Devices.	(e) Instruments and Components.	

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(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.	(1) Cranes (except articulating cranes) and derricks with variable angle booms shall be equipped with the following: (A) A boom angle indicator, readily visible to the operator. (B) A boom hoist limiting device.	
(ii) Articulating cranes must be equipped with a properly functioning automatic overload protection device.	(e)(5) Articulating cranes shall 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.	(e)(6) Equipment with a luffing jib shall 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.	(e)(2) Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator, at all times, the boom's extended length, or an accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.	
(v) Anti two-block. A device which automatically prevents damage and load failure from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) must be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur.	(e)(3)(A) An anti-two-block device shall be used which when activated, disengages all crane functions that can cause two-blocking. (B) When a derrick is used to hoist personnel platforms, limiting devices shall be installed to prevent two-blocking.	
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.	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.	*Question for AC: do we want to allow this exception?*
(vi) Controlled load lowering. The load line	(e)(4) The load line hoist drum shall have a	

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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).	system or device on the power train, other than the hoist brake, which regulates the lowering rate of speed of the hoist mechanism (controlled load lowering). NOTE: Free fall of the load line hoist is prohibited the use of equipment in which the boom hoist mechanism can free fall is also prohibited.	
(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.)	(d)(8) 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 §3314 for tag-out and related requirements.)	
(6) Direct attachment of a personnel platform to a luffing jib is prohibited.	(k)(9) 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 personnel.	(f) Personnel Platforms -Design Criteria. (1) The personnel platform and suspension system shall be designed by a register engineer.	
(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.	(i)(6) 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 must be designed to minimize tipping of the platform due to movement of employees occupying the	(f)(2) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the	

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platform	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.	(f)(3) The personnel platform itself, except the guardrail system and body belt/harness 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 must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design.	(g)(8) 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 must be equipped with a guardrail system which meets the requirements of subpart M of this part, and	(f)(3) …Criteria for guardrail systems and body belt/harness anchorages are contained in article 2 of the General Industry Safety Orders and article 24 of the Construction Safety Orders respectively.	
must be enclosed at least from the toe board to mid-rail with either solid construction material or expanded metal having openings no greater than 1⁄2 inch (1.27 cm).	(g)(1) Each personnel platform shall be equipped with a guardrail system which meet the requirements of article 2 of the General Industry Safety Orders and shall be enclosed at least from the toeboard to mid-rail with either solid construction or expanded metal having openings no greater than 1/2 inch.	
Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part.	(f)(3) …Criteria for guardrail systems and body belt/harness anchorages are contained in article 2 of the General Industry Safety Orders and article 24 of the Construction Safety Orders respectively.	
(7) A grab rail must be installed inside the entire perimeter of the personnel platform except for access gates/doors.	(g)(2) A grab rail shall be installed inside the entire perimeter of the personnel platform.	
(8) Access gates/doors. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must:	(g)(3) Access gates, if installed, shall not swing outward during hoisting.	

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(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.	(g)(4) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.	
(9) Headroom must be sufficient to allow employees to stand upright in the platform.	(g)(5) Headroom shall be provided which allows 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.	(g)(6) 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 must be smooth enough to prevent injury.	(g)(7) All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.	
(12) The weight of the platform and its rated capacity must be conspicuously posted on the platform with a plate or other permanent marking.	(g)(9) The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity.	
(f) Personnel platform loading. (1) The personnel platform must not be loaded in excess of its rated capacity.	(h) Personnel Platform Loading. (1) The personnel platform shall not be loaded in excess of its rated load capacity.	
(2) Use. (i) Personnel platforms must be used only for	(h)(3) Personnel platforms shall be used only for	

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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.	employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.	
(ii) Exception: Materials and tools to be used during the lift, if secured and distributed in accordance with paragraph (f)(3) of this section may be in the platform for trial lifts.	(j) Trial Lift, Inspection, and Proof Testing. …Materials and tools to be used during the actual lift can be loaded in the platform, as provided in section 5004(h)(4) and (5) for the trial lift…	
(3) Materials and tools must be: (i) Secured to prevent displacement. (ii) Evenly distributed within the confines of the platform while it is suspended.	(h)(4) Materials and tools for use during a personnel lift shall be secured to prevent displacement. (5) Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform 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.	(h) Personnel Platform Loading. (1) The personnel platform shall not be loaded in excess of its rated load capacity. (2) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.	
(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.	(i) Rigging. *** (2) 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, or other attachments assemblies or components) shall be: 1. Of a type that can be closed and locked, eliminating the hook throat opening. ~~Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may~~	

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	~~be used.~~ 2. 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.	~~Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.~~ (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.	
(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.	(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 (i)(2)(A) and (B). Such devices shall be closed and locked when attached.	
(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.	(i)(1) When a wire rope bridle is used to connect the personnel platform to the load line, each bridle leg shall be connected to a master link or shackle in such a manner to ensure 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.	(i)(3) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) shall ~~must~~ be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting without failure at least ten times the maximum intended load.	
(4) Eyes in wire rope slings must be fabricated with thimbles.	(i)(4) All eyes in wire rope slings shall be fabricated with thimbles.	
(5) Bridles and associated rigging for suspending the personnel platform must be	(i)(5) Bridles and associated rigging for attaching the personnel platform to the hoist	

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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.	line shall be used only for the platform and the necessary employees, their tools and materials necessary to do their work, and shall not be used for any other purpose when not hoisting personnel.	
(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.	(j) Trial Lift, Inspection, and Proof Testing. (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 personnel platform is to be hoisted and positioned.	
Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel.	(j)(1) Where there is more than one location to be reached from a single set-up position, either individual trial lifts for each location, or a single trial lift, in which the platform is moved sequentially to each location, must be performed; the method selected must be the same as the method that will be used to hoist the personnel. ~~A single trial lift may be performed at one time for all locations that are to be reached from a single set up position.~~	
(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	(1) …This trial lift shall be performed immediately prior to placing personnel on the platform… (2) The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Additionally, the trial lift shall be ~~replaced~~ repeated when the lift route is changed unless the operator determines that the route change is not significant, i.e. the route	

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presents no new factors affecting safety.	change would not affect the safety of hoisted employees.	
(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.	(j)(1) …The operator shall determine that all systems, controls and safety devices are activated and functioning properly; that no interferences exist; ~~and~~ that all configurations necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity, and that the load radius to be used during the lift has been accurately determined. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in section 5004(h)(4) and (5) for the trial lift.	
(4) Immediately after the trial lift, the competent person must: (i) Conduct a visual inspection of the equipment, base support or ground, and personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect.	(4) A visual inspection of the crane or derrick, rigging, personnel platform, and the crane or derrick base support or ground shall be conducted by a qualified person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.	
(ii) Confirm that, upon the completion of the trial lift process, the test weight has been removed.	(4) …The qualified person shall also confirm that the test weight has been removed upon completion of the trial lift.	
(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	(3) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches with the personnel and materials/tools on board and inspected by a qualified person to insure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist:	

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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.	(A) Hoist ropes shall be free of kinks and other deficiencies in accordance with §5036(a) through (d) and 5031(a). (B) Multiple part lines shall not be twisted around each other; (C) The primary attachment shall be centered over the platform; and (D) The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly positioned on drums and 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.]	(5) Any defects found during inspections which fails to meet a requirement of this standard or otherwise creates a safety hazard shall be corrected before hoisting personnel.	
(j) Proof testing. (1) At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must be proof tested to 125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift. (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	(6) At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the trial lift). After proof testing, a qualified person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.	

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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.		
(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.	(d) Operational Criteria. (1) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, 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.	(k) Work Practices. (1) Employees shall: (A) Keep all parts of the body inside the platform during raising, lowering, and horizontal movement ~~positioning~~. This provision does not apply to an occupant of the platform when necessary to position the platform or while performing the duties of a signal person.	
(ii) Not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height. (iii) Not pull the platform out of plumb in relation to the hoisting equipment.	(B) Not stand, sit on, or work from the top or intermediate rail or toeboard, or use any other means/device to raise their working height. (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 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.	(2) Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation.	

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(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.	(A) 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 must be used when necessary to control the platform.	(3) Tag lines shall be used unless their use creates an unsafe condition.	
(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.	(4) Attendance. ~~The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied~~. (A) 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.	Adopt federal verbiage.
(7) Platforms with controls. Where the platform is equipped with controls, all of the following must be met at all times while the platform is occupied: (i) The occupant using the controls in the platform must be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation. (ii) The equipment operator must be at a set of equipment controls that include boom and swing functions of the equipment, and must be on site and in view of the equipment. (iii) The platform operating manual must be in the platform or on the equipment.	(B) 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: 1. 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. 2. The equipment operator shall be at a set of equipment controls that include boom and swing functions of the equipment, and shall be on site and in view of the equipment. 3. The platform operating manual shall be in the platform or on the equipment.	*AC may want to discuss this one.*
(8) Environmental conditions. (i) Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a	(5) Environmental conditions. ~~Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions~~	Adopt federal verbiage.

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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).	~~or other impending danger.~~ (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 safe to lift personnel. If it is not safe, 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 safe to lift personnel. If it is not safe, the lifting operation shall not begin (or, if already in progress, shall be terminated).	
(9) Employees being hoisted must remain in direct communication with the signal person (where used), or the operator.	(6) Employees being hoisted and the signal person(s) shall remain in continuous radio communication with 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.	(7) Fall protection. (A) Except over water, employees occupying the personnel platform shall be provided and use a personal fall arrest ~~body belt/harness~~ system with lanyard appropriately attached to the lower load block or overhaul ball, or to structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage. When working over water, the requirements of section 1602 of the Construction Safety Orders shall apply. (B) The fall arrest system, including the attachment point (anchorage) used to comply with subsection (A), shall comply with Article 24 of the Construction Safety Orders.	
(11) Other load lines.	(8) No lifts shall be made on another of the	See 1926.1431(p) – p. 179 below, for more on

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(i) No lifts must be made on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations.	crane's or derrick's load-lines while personnel are suspended on a platform.	pile driving. *Coordinated with CSO 1600(g)(1)(B)*
(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.		*AC: This sounds like a pin-on platform, covered by 3647. Do we want to permit an on-board winch?*
(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.	(*l*) Traveling. (1) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and cranes on fixed tracks or railways.	
(ii) Where employees are hoisted while the equipment is traveling, all of the following criteria must be met:	(2) Under any circumstances where a crane would travel while hoisting personnel, the employer shall implement the following procedures to safeguard employees:	
(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.	(D) Equipment travel shall be restricted to a fixed track or runway. (E) Where a runway is used, it shall be a firm, level surface designed, prepared and designated as a path of travel for the weight and configuration of the equipment being used to lift and travel with the personnel platform. An existing surface may be used as long as it meets these criteria.	
(C) Equipment travel must be limited to boom	(A) Travel shall be limited to the load radius of	

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length. (D) The boom must be parallel to the direction of travel, except where it is safer to do otherwise. (E) A complete trial run must be performed to test the route of travel before employees are allowed to occupy the platform. This trial run can be performed at the same time as the trial lift required by paragraph (h) of this section which tests the lift route.	the boom used during the lift; and (B) The boom must be parallel to the direction of travel; (C) 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 section 5004(j)(1) of these Orders which tests the route of the lift.	
(13) Traveling—derricks. Derricks are prohibited from traveling while personnel are hoisted. (l) [Reserved.]	(*l*)(1) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and cranes on fixed tracks or railways.	
(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. (1) A meeting attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed shall be held to review the appropriate requirements of section 5004 of these Orders and the procedures to be followed. (2) This meeting shall be 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.	Copied from 1616.6(n).
(o) Hoisting personnel in drill shafts. When	(o) Hoisting personnel in drill shafts. When	

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hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements must be met: (1) The employee must be in either a personnel platform or on a boatswain's chair. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), (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.	hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements shall be met: (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 apply: (c), (d)(1), (d)(3)-(d)(4), (d)(5)(A), (d)(5)(C), (f)(1), (f)(2), (h)(1), (h)(3), (h)(4), (h)(5), (i)(2), (i)(6), (j), (k)(4)(A), (k)(5), (k)(6), (k)(8), (m), and (n). Where the terms ''personnel platform'' or ''platform'' are used in these subsections, replace 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 of 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	*Coordinated with 1926.1431(k)(11) and*

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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.	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.	*5004(d)(8) – p. 176 above, also coordinated with CSO 1600(g)(1)(B)*
(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 twoblocking, and use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	(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.		All of section 5004 applies as applicable.
(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.	(3) If using a boatswain's chair, subsections (o)(3)(A), (C), (D), (E), (F) and (G) shall apply. Where the terms "personnel platform" or "platform" are used in these subsections, substitute "boatswains chair."	Repetitive requirements condensed. 1926.1431(p)(4) [5004(p)(4)] is the same as (o)(3) except as noted.
(iii) The employee must use personal fall protection equipment, including a full body	Exception: In lieu of personal fall protection attached independent of the crane/derrick per	*Question for AC: Is tying off to the lower load block or overhaul ball per 1926.1431(p)(4)(iii)*

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harness, independently attached to the lower load block or overhaul ball. (iv) The fall protection equipment must meet the applicable requirements in § 1926.502. (v) The boatswain's chair itself (excluding the personal fall arrest system anchorages), must be capable of supporting, without failure, its own weight and at least five times the maximum intended load. (vi) No more than one person must be hoisted at a time. (q) [Reserved.]	subsection (o)(3)(D), personal fall protection may be independently attached to the lower load block or overhaul ball. (q) [Reserved.]	*acceptable?*
(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. (iii) The number of workers occupying the	(r) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements shall be met: (1) The employee shall be in either a personnel platform or a marine-hoisted personnel transfer device. (2) If using a personnel platform, paragraphs (a) through (n) of this section apply. (3) If using a marine-hoisted personnel transfer device: (A) The following subsections apply: (c), (d)(1), (d)(3), (d)(4), (d)(5)(A) & (C), (f)(1) through (f)(3), (g)(8), (g)(9), (h)(1), (i)(2), (i)(6), (j), (k)(5) through (k)(8), (*l*), (m), and (n). Where the terms ''personnel platform'' or ''platform'' are used in these subsections, replace them with ''marine-hoisted personnel transfer device.'' (B) The transfer device shall be used only for transferring workers. (C) The number of workers occupying the	

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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.	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 must be to the lower load block or	(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, paragraphs (a) through (n) of this section apply. (3) If using a boatswain's chair: (A) The provisions of subsection (o)(3)(A), (C), (D), (E), (F) and (G) shall apply. (4) When there is no adequate structure for attachment of required personal fall arrest equipment, the attachment shall be to the lower load block or overhaul ball.	Repetitive requirements were condensed. *Question for AC: Is tying off to the lower load block or overhaul ball per 1926.1431(s)(3)(iii) acceptable?*

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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.		
§ 1926.1432 Multiple-crane/derrick lifts—supplemental requirements.	**§4994. Hoisting.**	Amend 4994 with federal.
(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.	(f) Multiple crane/derrick lifts – Supplemental requirements for construction. (1) 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 shall meet the following requirements: (A) The plan shall be developed by a qualified person. (B) The plan shall be designed to ensure that the requirements of these Orders are met. (C) 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). (2) The lift director must review the plan in a	(2) Plan implementation. (A) The multiple-crane/derrick lift shall be directed by a person (lift director) who meets the criteria for both a competent person and a qualified person. (B) The lift director shall review the plan in a meeting with all workers who will be involved	*AC: review and comment on this proposal; i.e. qualifications of lift director*

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meeting with all workers who will be involved with the operation.	with the operation.	
§ 1926.1433 Design, construction and testing.	**§4884. ~~Scope~~ Standards Incorporated by Reference.**	
The following requirements apply to equipment that has a manufacturer-rated hoisting/lifting capacity of more than 2,000 pounds.	(a) ~~The Orders in this Group shall apply to derricks, cranes, and boom-type excavators, but they shall not apply to aerial devices designed and used for positioning personnel (See Article 24).~~ Cranes shall be designed, constructed, and installed in accordance with the following standards which are hereby incorporated by reference. Unless specified otherwise in this Group, these requirements apply to equipment that has a manufacturer-rated hoisting/lifting capacity of more than 2,000 pounds.	Remark: See 1926.1441 for 2000# or less.
(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.	4884(c)(1)(B) Cranes and derricks manufactured after June 23, 1999 and before July 7, 2011 shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference: *** B30.5-1994, Mobile and Locomotive Cranes ***	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. 4884(e)(1) prescribes B30.5-1968 for cranes and derricks manufactured prior to 9/28/86. Other sections prescribe more recent editions of B30.5 prior to the federal effective date; therefore CA is ALAEA.
(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’’),	4884(d) Cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference:	July 7, 2011 is CA effective date for cranes in construction and is being brought forward from CSO section1610.4(b) which was previously approved by OSHA.

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paragraphs (a)—(d) (including subparagraphs). (2) In section 5–1.1.2 (‘‘Load Ratings—Where Structural Competence Governs Lifting Performance’’), paragraph (b). (3) Section 5–1.2 (‘‘Stability (Backward and Forward)’’).	*** ASME B30.5–2004, Mobile and Locomotive Cranes, issued Sept. 27, 2004 (“ASME B30.5–2004”).	
(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.		Typo at federal (b)(4) – should read “§1926.1414(e)(4)(ii)(A) applies” CA requires compliance with all sections of B30.5.
(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).		CA requires compliance with all sections of B30.5.
(c) Prototype testing: mobile (including crawler and truck) and locomotive cranes manufactured	(i) Prototype testing: Cranes manufactured on or after November 8, 2010 shall meet the	Since any cranes manufactured in California are extremely likely to be used in interstate

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on or after November 8, 2010 must meet the prototype testing requirements in Test Option A or Test Option B of this section. Tower cranes manufactured on or after November 8, 2010 must meet the prototype testing requirements in BS EN 14439:2006 (incorporated by reference, see § 1926.6). Note: Prototype testing of crawler, locomotive and truck cranes manufactured prior to November 8, 2010 must conform to paragraph (a) of this section. (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	prototype testing requirements prescribed in 29 CFR 1926.1433(c).	commerce, California proposes to reference federal standards for prototype testing, including federal effective date.

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following additional requirements must be met: (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J1063 (Nov. 1993) (incorporated by reference, see § 1926.6) meet the strength margins listed in SAE J1063 (Nov. 1993) Table 2. (ii) The following applies to equipment with pendant supported lattice booms: The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J987 (Jun. 2003) (incorporated by reference, see § 1926.6) meet the strength margins listed in SAE J987 (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:		These federal requirments apply to mobile cranes. T8, Art. 92 contains requirements for cranes (except boom type mobile), Art 93 is for boom-type mobile, Art. 96 is for tower cranes. Each article contains crane type-specific requirements, thus it is not necessary to repeat them here.

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(i) A complete range of the manufacturer's equipment rated capacities, as follows: (A) At all manufacturer approved operating radii, boom angles, work areas, boom lengths and configurations, jib lengths and angles (or offset). (B) Alternate ratings for use and nonuse of option equipment which affects rated capacities, such as outriggers, stabilizers, and extra counterweights. (ii) A work area chart for which capacities are listed in the load chart. (Note: An example of this type of chart is in ASME B30.5–2004, section 5–1.1.3, Figure 11). (iii) The work area figure and load chart must clearly indicate the areas where no load is to be handled. (iv) Recommended reeving for the hoist lines must be shown. (v) Recommended parts of hoist reeving, size, and type of 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).		

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(x) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered. (xi) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (xii) The maximum telescopic travel length of each boom telescopic section. (xiii) Whether sections are telescoped manually or with power. (xiv) The sequence and procedure for extending and retracting the telescopic boom section. (xv) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (xvi) Hydraulic relief valve settings specified by the manufacturer.		
(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.	4881(c) 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.	*7/3/14 revision to draft: this section was relocated to 4881 from 4994(g) to line-up with federal location.*
(3) Hook and ball assemblies and load blocks must be marked with their rated capacity and weight.	(d) ~~Hooks,~~ hook and ball assemblies, load blocks. [Relocated from 5050] (1) ~~Hooks~~, hook and ball assemblies and load blocks shall be marked with their rated capacity and weight (mobile cranes).	
(4) Latching hooks. (i) Hooks must be equipped with latches, except where the requirements of paragraph (d)(4)(ii) of this section are met.	(2) ~~Latching Hooks~~. Hook and ball assemblies and load blocks shall be equipped with latches. Exception: Hooks without latches, or with	

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(ii) Hooks without latches, or with latches removed or disabled, must not be used unless: (A) A qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied-back).	latches removed or disabled, shall not be used unless a qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied-back).	
(B) Routes for the loads are preplanned to ensure that no employee is required to work in the fall zone except for employees necessary for the hooking or unhooking of the load.	§5002. Overhead Loads. 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.	
(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.	5050(b)(3) The latch shall close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.	
(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.		See sections 4907, 4923, 4961, and 4965 for crane-specific requirements.
(6) An accessible fire extinguisher must be on the equipment.	§4997. Fire Extinguisher. A fire extinguisher of not less than 10-B:C rating shall be kept in serviceable condition and readily accessible to the operator's station, and affected personnel shall be familiarized with its use.	
(7) Cabs. Equipment with cabs must meet the following requirements: (i) Cabs must be designed with a form of	4882(a) Cabs. Equipment with cabs shall meet the following requirements: (1) Cabs shall be designed with a form of	Some of these requirements exceed B30 standards and existing GISO provisions which apply to general industry, thus they have been

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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.	adjustable ventilation and method for clearing the windshield (when provided) for maintaining visibility and air circulation. Examples of means for adjustable ventilation may include an air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility may include heater (for preventing windshield icing), defroster, fan, windshield wiper. (2) 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 shall open outward. Sliding operator doors shall open rearward.	identified as supplemental requirements for cranes in construction. ~~*Question for AC: do these need to be identified as supplemental requirements for construction or can they also be applied to GI?*~~
(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.	(3) Windows (if provided) or other openings. (A) Windows or other openings shall be provided in front and on both sides of the operator with visibility forward and to either side. Forward vertical visibility shall be sufficient to give the operator a view of the boom point at all times.	
(B) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened 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.	(B) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened must be designed so that they can be secured to prevent inadvertent closure. (C) Windows shall be 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.	S. 4925(b) contains similar requirements for mobile cranes; however, s. 4882 will apply to tower cranes or other cranes with cabs as well.
(iv) A clear passageway must be provided from	(4) A clear passageway shall be provided from	

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the operator's station to an exit door on the operator's side.	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.	(5) 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.		This is a requirement of ASME B30 standards which have been incorporated by reference by section 4884.
(9) All exhaust pipes, turbochargers, and charge air coolers must be insulated or guarded where contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties.	4881(b) All exhaust pipes, turbochargers, and charge air coolers shall be insulated or guarded where inadvertent contact by employees (except for maintenance and repair employees) is possible in the performance of normal duties.	
(10) Hydraulic and pneumatic lines must be protected from damage to the extent feasible.		This is a requirement of ASME B30 standards which have been incorporated by reference by section 4884.
(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.		This is a requirement of ASME B30 standards which have been incorporated by reference by section 4884.
(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	4949(e) Friction mechanisms. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they shall be: (1) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving. (2) Adjustable to permit compensation for	

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lining wear to maintain proper operation.	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.	4949(f) 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.		Rather than rely on manufacturer's documentation which may or may not be available, CA verifies compliance with these requirements using frequent inspections as prescribed in sections 5031-5031.4.
§ 1926.1434 Equipment modifications.	**§4884.1. Equipment modifications – Mobile and Tower Cranes.**	*Review application with AC: Not applicable to overhead and bridge cranes?*
(a) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the requirements of paragraphs (a)(1), (a)(2), (a)(3), (a)(4), or (a)(5) of this section are met.	(a) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the requirements of subsections (a)(1) or (a)(2) ~~(a)(3), (a)(4), or (a)(5)~~ 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.	(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		This option not allowed in CA. CA is more protective.

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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.		
(3) Unavailable manufacturer. The manufacturer is unavailable and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	(2) Unavailable manufacturer. The manufacturer is unavailable and the following requirements are met: (A) A certified agent 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.	Paragraphs (a)(2)(i) and (ii) are spelled-out here.
(4) Manufacturer does not complete the review within 120 days of the request. The		Not allowed. CA is more protective.

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manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.		
(5) Multiple manufacturers of equipment designed for use on marine work sites. The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.		This option is covered by (a)(1) and (a)(2) above.
(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.		Not allowed. CA is more protective.
(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.	**Article 96. Tower Cranes.**	
(a) This section contains supplemental	§4965. General.	GISO standards are horizontal, so Article 96

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requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise.	(a) The requirements of this Article shall apply to cranes of the general type such as those having a revolving boom with counterweight on a single vertical mast, and mobile tower cranes.	supplements other applicable parts of Group 13.
(b) Erecting, climbing and dismantling. (1) Section 1926.1403 (Assembly/ Disassembly—selection of manufacturer or employer procedures), § 1926.1404 (Assembly/Disassembly—general requirements (applies to all assembly and disassembly operations)), § 1926.1405 (Disassembly—additional requirements for dismantling of booms and jibs (applies to both the use of manufacturer procedures and employer procedures)), and § 1926.1406 (Assembly/Disassembly—employer procedures—general requirements), apply to tower cranes (except as otherwise specified), except that the term ‘‘assembly/disassembly’’ is replaced by ‘‘erecting, climbing and dismantling,’’ and the term ‘‘disassembly’’ is replaced by ‘‘dismantling.’’	§4966. Erecting, Climbing, Dismantling and Operation. *** (i) Application of assembly and disassembly requirements to tower cranes. (1) Section 5010 (Assembly/ Disassembly – selection of manufacturer or employer procedures), §5010.1 (Assembly/ Disassembly—general requirements) applies to all assembly and disassembly operations, §5010.2 (Disassembly—additional requirements for dismantling of booms and jibs) applies to both the use of manufacturer procedures and employer procedures, and §5010.3 (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.”	GISO 4966(a) modified to accommodate federal verbiage.
(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	(2) Dangerous areas (self-erecting tower cranes). In addition to the requirements in §5010.1(e), the following shall apply for self-erecting tower cranes: Employees shall not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a locked position and the competent	

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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.	person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.	
(3) Foundations and structural supports. Tower crane foundations and structural supports (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. (A) The controlling entity shall ensure the tower crane foundations and structural supports are installed in accordance with the manufacturer's or certified agent's instructions. (B) The controlling entity shall provide a written statement of compliance with subsection (A), above, to the erecting entity prior to erection or jump of the tower crane. (C) The top of the support/foundation shall be accessible and free of debris, materials and standing water. No materials shall be stored on the support unless approved by a qualified person. The foundation and fasteners shall remain accessible and visible for inspection at all times.	Red text copied from 1619.1(b)(3) – previously approved.
(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	(4) Addressing specific hazards. The requirements in §5010.1(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	

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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.	stability before swinging self-erecting cranes or cranes on traveling or static undercarriages. (C) Wind speed. Wind shall not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.	
(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).	(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 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.	(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.	
(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.	
(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.	(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	

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(ii) The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment must not be exceeded.	specified by the manufacturer or certified agent familiar with the equipment shall not be exceeded.	
(c) Signs. The size and location of signs installed on tower cranes must be in accordance with manufacturer specifications. Where these are unavailable, a registered professional engineer familiar with the type of equipment involved must approve in writing the size and location of any signs.	4965(k) Signs. The size and location of signs installed on tower cranes shall be in accordance with manufacturer specifications. Where these 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:	**§4968. Safety Devices.** Section 5017 does not apply to tower cranes. All tower cranes shall have the following safety devices:	
(i) Boom stops on luffing boom type tower cranes.	(h) Boom stops on luffing boom type tower cranes.	
(ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment.	(i) 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.	(k) Cranes mounted on rail tracks shall be equipped with limit switches limiting the travel of the crane on the track, and stops or buffers at each end of the tracks.	Relocated from 4965(h) to place in safety devices.
(iv) Travel rail clamps on all travel bogies.	(j) Trolley end stops shall be provided at both ends of travel of the trolley (travel bogie).	As defined by section 4885, travel bogie and trolley are the same.
(v) Integrally mounted check valves on all load supporting hydraulic cylinders.	(l) Integrally mounted check valves on all load supporting hydraulic cylinders.	
(vi) Hydraulic system pressure limiting device.	(m) 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.	(n) The following brakes, which must automatically set in the event of pressure loss or power failure, are required: (1) A hoist brake on all hoists. (2) Swing brake.	

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(C) Trolley brake. (D) Rail travel brake.	(3) Trolley brake. (4) Rail travel brake.	
(viii) Deadman control or forced neutral return control (hand) levers.	(g) Constant pressure control devices which automatically return to neutral or the "off" position when released by the operator.	
(ix) Emergency stop switch at the operator's station.	(o) Emergency stop switch at the operator's station.	
(x) Trolley end stops must be provided at both ends of travel of the trolley.	(j) Trolley end stops shall be provided at both ends of travel of the trolley (travel bogie).	As defined by section 4885, travel bogie and trolley are the same.
(3) Proper operation required. Operations must not begin unless the devices listed in this section are in proper working order. If a device stops working properly during operations, the operator must safely stop operations. The equipment must be taken out of service, and operations must not resume until the device is again working properly. See § 1926.1417(f). Alternative measures are not permitted to be used.	**4968.1 Safety Devices - Proper operation required.** Operations shall not begin unless the devices listed in section 4968 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 §5008.1(e). Alternative measures are not permitted to be used.	
(e) Operational aids. (1) Section 1926.1416 does not apply to tower cranes.	**4968.2. Operational Aids.** (a) Section 5018 does not apply to tower cranes.	Some rationales (below) carried over from CSO RM.
(2) The devices listed in this section (''operational aids'') are required on all tower cranes covered by this subpart, unless otherwise specified.	(b) 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	(c) 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 §5008.1(g) for additional	

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requirements.	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.	(d) If an operational aid stops working properly during operations, the operator shall safely stop operations until ~~the temporary alternative measures are implemented or~~ the device is again working properly.	Use of a substitute device is not permitted without Division approval. (Ed note: temporary alternatives should not be permitted.)
(5) Category I operational aids and alternative measures. Operational aids listed in this paragraph that are not working properly must be repaired no later than 7 calendar days after the deficiency occurs. Exception: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, the repair must be completed within 7 calendar days of receipt of the parts.	(e) Category I operational aids ~~and alternative measures. Operational aids listed in this subsection 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.~~ Operational aids listed in this subsection shall be operational prior to and during operation at all times.	All operational aids must be operational prior to and operational at all times. (Required by the manufacturer). Alternatives not permitted. [Ed note: red mods recommended to be same as 1619.1(e)(4)]
(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	(1) 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 permitted.

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when operations are conducted within 10 feet of the outer or inner trolley end stops.		
(ii) Boom hoist limiting device. The range of the boom must be limited at the minimum and maximum radius. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	(2) Boom hoist limiting device. The range of the boom must be limited at the minimum and maximum radius.	Alternatives not permitted.
(iii) Anti two-blocking device. The tower crane must be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) must prevent such damage at all points where two-blocking could occur. Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.	(3) Anti two-blocking device. The tower crane shall be equipped with a device which automatically prevents damage from contact between the load block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component). The device(s) shall prevent such damage at all points where two-blocking could occur.	Alternatives not permitted.
(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	(4) Hoist drum lower limiting device. Tower cranes manufactured after July 7, 2012 shall be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum.	Alternatives not permitted. July 7, 2012 effective date is transferred from CSO 1619.1(e)(5)(D).

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point that will give the operator sufficient time to stop the hoist prior to last 2 wraps of hoist cable being spooled off the drum, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached		
(v) Load moment limiting device. The tower crane must have a device that prevents moment overloading. Temporary alternative measures: A radius indicating device must be used (if the tower crane is not equipped with a radius indicating device, the radius must be measured to ensure the load is within the rated capacity of the crane). In addition, the weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.	(5) Load moment limiting device. The tower crane shall have a device that prevents moment overloading.	Alternatives not permitted.
(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).	(6) 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 permitted.
(vii) Rail travel limiting device. The travel	(7) Rail travel limiting device. The travel	Alternatives not permitted.

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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.	distance in each direction shall be limited to prevent the travel bogies from running into the end stops or buffers.	
(viii) Boom hoist drum positive locking device and control. The boom hoist drum must be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. Temporary alternative measures: The device must be manually set when required if an electric, hydraulic or automatic control is not functioning.	(8) Boom hoist drum positive locking device and control. The boom hoist drum shall be equipped with a control that will enable the operator to positively lock the boom hoist drum from the cab. Temporary alternative measures: The device shall be manually set when required if an electric, hydraulic or automatic control is not functioning.	*AC: Is the manual means an alternative, or just one acceptable method of positive locking?*
(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	(9) Boom angle or hook radius indicator. (A) Luffing boom tower cranes must have a boom angle indicator readable from the	Alternatives not permitted. Effective date brought forward from CSO 1619.1(e)(5)(I).

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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.	operator's station. (B) Hammerhead tower cranes manufactured after July 7, 2012 must have a hook radius indicator readable from the operator's station.	
(ii) Trolley travel deceleration device. The trolley speed must be automatically reduced prior to the trolley reaching the end limit in both directions. Temporary alternative measure: The employer must post a notice in the cab of the crane notifying the operator that the trolley travel deceleration device is malfunctioning and instructing the operator to take special care to reduce the trolley speed when approaching the trolley end limits.	(10) 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 CSO 4968.
(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.	(11) Boom hoist deceleration device. The boom speed shall be automatically reduced prior to the boom reaching the minimum or maximum radius limit.	Alternatives not permitted.
(iv) Load hoist deceleration device. The load speed must be automatically reduced prior to the hoist reaching the upper limit.	(12) Load hoist deceleration device. The load speed shall be automatically reduced prior to the hoist reaching the upper limit.	Alternatives not allowed by GISO 4968

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Temporary alternative measure: The employer must post a notice in the cab of the crane notifying the operator that the load hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the load speed when approaching the upper limits.		
(v) Wind speed indicator. A device must be provided to display the wind speed and must be mounted above the upper rotating structure on tower cranes. On self erecting cranes, it must be mounted at or above the jib level. Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed.	(13) Wind speed indicator. A device shall be provided to display the wind speed and shall be mounted above the upper rotating structure on tower cranes. On self-erecting cranes, it shall be mounted at or above the jib level. Temporary alternative measures: Use of wind speed information from a properly functioning indicating device on another tower crane on the same site, or a qualified person estimates the wind speed.	*AC: OK to allow a qualified person to estimate 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.	(14) Load indicating device. Cranes manufactured after July 7, 2012 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	**4965.1. Inspections.** (a) Articles 99 and 100 apply to tower cranes,	

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tower cranes, except that the term ‘‘assembly’’ is replaced by ‘‘erection.’’ Section 1926.1413 (Wire rope—inspection) applies to tower cranes.	except that the term “assembly” is replaced by “erection.” Section 5036 (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 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.	(b) Pre-erection inspection. Before each crane component is erected, it shall be inspected by a qualified person for damage or excessive wear. (1) The qualified person shall pay particular attention to components that will be difficult to inspect thoroughly during shift inspections. (2) If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, that component shall not be erected on the crane unless it is repaired and, upon reinspection by the qualified person, found to no longer create a safety hazard. (3) 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	(c) Post-erection inspection. In addition to the requirements in §5031.2, the following requirements shall be met: (1) 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. (2) The load test shall be conducted in accordance with sections 344.81, 5022 and the	Added reference to GISO 5022 (which covers proof load testing in depth) to fed verbiage. “Other test methods” subject to approval by the Division. *(Question for Division: is the “other methods” option permissible?)*

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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.	manufacturer's instructions when available. Where the manufacturer's instructions are unavailable, other methods of proof load testing may be submitted for the above where acceptable to the Division.	
(4) Monthly. The following additional items must be included: (i) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (ii) The upper-most tie-in, braces, floor supports and floor wedges where the tower crane is supported by the structure, for loose or dislodged components.	(d) Monthly. The following additional items shall be included: (1) 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. (2) The upper-most tie-in, braces, floor supports and floor wedges where the tower crane is supported by the structure, for loose or dislodged components.	
(5) Annual. In addition to the items that must be inspected under § 1926.1412(f), all turntable and tower bolts must be inspected for proper condition and torque.	(e) Annual. In addition to the items that must be inspected under §5022(d), 5031(c), and 5031.1, all turntable and tower bolts shall be inspected for proper condition and torque.	
§ 1926.1436 Derricks.	**Article 95. 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 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.	4885 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.	
Derricks include: A-frame, basket, breast,		These types of cranes are defined and/or

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Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shearleg, stiffleg, and variations of such equipment.		illustrated in GISO Section 4885, including Plate II.
(b) Operation—procedures. (1) Section 1926.1417 (Operation) applies except for § 1926.1417(c) (Accessibility of procedures).	4959. Operation – Procedures. (a) Section 5008.1 (Operation) applies except for §5008.1(b) (Accessibility of procedures).	
	4961. Rated Load Marking. (a) For permanently installed derricks with fixed lengths of boom, guy and mast, a substantial durable and clearly legible rating chart shall be provided with each derrick and securely affixed where it is visible to personnel responsible for the safe operation of the equipment.	
(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.	The chart shall include but not necessarily be limited to the following data: (1) Certified agent's approved load ratings at corresponding ranges of boom angle or operating radii. (2) Specific length of components on which the load ratings are based. (3) Required parts for hoisting reeving. (4) Size and construction of the rope ~~may~~ shall be shown either on the rating 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.	4961(a) For permanently installed derricks with fixed lengths of boom, guy and mast, a substantial durable and clearly legible rating chart shall be provided with each derrick and securely affixed where it is visible to personnel responsible for the safe operation of the equipment.	

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(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.	4961(b) For non-permanent installations, capacity charts shall be prepared for the particular installation based on information provided by the certified agent. The capacity charts shall be located at the derrick.	
(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).	§4884. Standards Incorporated by Reference. (a) Cranes and derricks shall be designed, constructed, and installed in accordance with the following standards which are hereby incorporated by reference. *** (d) Cranes and derricks manufactured after July 7, 2011 shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards which are hereby incorporated by reference: *** B30.6-1995, Derricks	ASME B30.6, which is incorporated by section 4884, prescribes all these requirements.
(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.	§4960. Construction. *** (a) Guy derricks. (1) 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.	Similar B30.6, sec. 6-1.2.2 *AC: Require certificating agency or qualified person in (1)?*
(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.	(2) 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: (A) The number of guys.	*AC: Require certificating agency or qualified person in (2)?*

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(B) The spacing around the mast. (C) The size, grade, and construction of rope to be used for each guy.	(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.	(3) For guy derricks manufactured after December 18, 1970, in addition to the information required in subsection (a)(2), the employer shall 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.	*AC: Require certificating agency or qualified person in (3)?*
(iv) The mast base must permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack.	(4) The mast base shall permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack.	
(v) The mast cap 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. (D) Be provided with means for attaching guy ropes.	(5) The mast cap shall: (A) Permit the mast to rotate freely. (B) Withstand tilting and cramping caused by the guy loads. (C) Be secured to the mast to prevent disengagement during erection. (D) Be provided with means for attaching guy ropes.	
(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	§4960(b) Stiffleg derricks. (1) 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. (2) The stifflegs shall be capable of withstanding the loads imposed at any point of operation within the load chart range. (3) The mast base shall: (A) Permit the mast to rotate freely (when	

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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.	necessary). (B) Permit deflection of the mast without binding. (4) The mast shall be prevented from lifting out of its socket when the mast is in tension. (5) The stiffleg connecting member at the top of the mast shall: (A) Permit the mast to rotate freely (when necessary). (B) Withstand the loads imposed by the action of the stifflegs. (C) Be secured so as to oppose separating forces.	
(4) Gin pole derricks. (i) Guy lines must be sized and spaced so as to make the gin pole stable in both boomed and vertical positions. Exception: Where the size and/or spacing of guy lines do not result in the gin pole being stable in both boomed and vertical positions, the employer must ensure that the derrick is not used in an unstable position. (ii) The base of the gin pole must permit movement of the pole (when necessary). (iii) The gin pole must be anchored at the base against horizontal forces (when such forces are present).	§4960(c) Gin pole derricks. (1) 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. (2) The base of the gin pole shall permit movement of the pole (when necessary). (3) 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	§4960(d) Chicago boom derricks. The fittings for stepping the boom and for attaching the topping lift shall be arranged to: (1) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (2) Accommodate attachment to the upright	

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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.	member of the host structure. (3) Withstand the forces applied when configured and operated in accordance with the manufacturer's/builder's procedures and within its rated capacity. (4) 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.	§4960(e) Anchoring and guying. (1) General requirements. (A) ~~(a)~~ Derricks shall be guyed and anchored so as to prevent tipping or collapsing. (B) ~~(b)~~ Reinforcing steel shall not be used for guy line anchors. (C) Load anchoring data developed by the manufacturer or a qualified person shall be used.	*AC: Require certificating agency or qualified person in (C)?*
(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	(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. (i) The mast base and stifflegs must be anchored. (ii) The mast base and stifflegs must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular stiffleg spacing and slope specified for the application	(3) Stiffleg derricks. (A) The mast base and stifflegs shall be 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.	§4960(f) Swingers and hoists.	Since B30.7 is incorporated by reference, there

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<table>
<tr><th>FEDERAL: §</th><th>STATE:</th><th>RATIONALE</th></tr>
<tr><td>(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’’).</td><td>(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 of ASME B30.7–2001 which is incorporated by reference.</td><td>is no need to specify subsections. To do so would raise questions about what other parts may or may not apply. B30.7 has been adopted in its entirety.</td></tr>
<tr><td>(ii) Load tests for new hoists.</td><td>§4960(f)(2)(B) Load tests for new, repaired and modified hoists. See Article 99 for testing requirements.</td><td></td></tr>
<tr><td>(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.</td><td>Article 99, §5023. Proof Load Test and Examination of Derricks and Their Accessory Gear.
(a) Proof load tests of derricks shall be carried out at the same intervals as specified in Section 5022(a) for cranes.
(b) Proof load tests and safe working load ratings shall be based on the designed load ratings at the ranges of boom angle or operating radii. Proof loads shall exceed the safe working load (SWL) as follows:
<table>
<tr><td>SWL</td><td>Proof Load</td></tr>
<tr><td>Up to 20 tons</td><td>25 percent in excess</td></tr>
<tr><td>20-50 tons</td><td>5 tons in excess</td></tr>
</table></td><td></td></tr>
</table>

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	Over 50 tons | 10 percent in excess	
(iii) Repaired or modified hoists. Hoists that have had repairs, modifications or additions affecting their capacity or safe operation must be evaluated by a qualified person to determine if a load test is necessary. If it is, load testing must be conducted in accordance with paragraphs (e)(2)(ii) and (iv) of this section.	Art. 99, §5022. Proof Load Test and Examination of Cranes and Their Accessory Gear. (a) Proof load tests of cranes shall be carried out at the following intervals: (1) Cranes exceeding 1 ton rated capacity: *** (C)~~(3)~~ In the case of major modifications or repairs ~~to important structural components~~ which affect the safe operation of the equipment (such as but not limited to 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 before they are returned to service.	
(iv) Load test procedure. Load tests required by paragraphs (e)(2)(ii) or (e)(2)(iii) of this section must be conducted as follows:	§5023(b) Proof loads shall be applied at the designed maximum and minimum boom angles or radii or, if this is impracticable, as close to these as practicable. The angles or radii of test shall be in the certificate of test. Proof loads shall be swung as far as possible in both directions. The weight of all auxiliary handling devices such as blocks, hooks, etc., shall be considered a part of the load.	
(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).	(1) Hoist and brakes shall be tested as follows: (A) The test load shall be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s). (B) The test load shall be lowered, stopped and held with the brake(s).	

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(C) The hoist must not be used unless a competent person determines that the test has been passed.	(C) 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).	§4960.1. Operational aids. (a) Section 5018 (Operational aids) applies, except for §5018(d)(1) (Boom hoist limiting device), §5018(e)(1) (Boom angle or radius indicator), and §5018(e)(4) (Load weighing and similar devices).	
(2) Boom angle aid. A boom angle indicator is not required but if the derrick is not equipped with a functioning one, the employer must ensure that either: (i) The boom hoist cable must be marked with caution and stop marks. The stop marks must correspond to maximum and minimum allowable boom angles. The caution and stop marks must be in view of the operator, or a spotter who is in direct communication with the operator; or (ii) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement, is used.	(b) 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: (1) 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 (2) 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	§4960.1(c) Load weight/capacity devices. (1) Derricks manufactured more than one year after July 7, 2011 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	Fed verbiage amended with state effective date from CSO 1619.2(f).

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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.	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 §5008.1(g) for additional requirements. (2) 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. (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.	§4960.2. Post-assembly approval and testing—new or reinstalled derricks. (a) Anchorages. Anchorages, including the structure to which the derrick is attached (if applicable), shall be approved by a certificating agency.	Certified agent required per GISO 5020. *(AC review for recombine)* Fed (g)(1)(ii) - 4960(b) prohibits the use of rebar/hairpin anchorage.
(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.	(b) Functional test. Prior to initial use, new or reinstalled derricks shall be tested in accordance with Section 5020.	§5020. Operational Testing. (a) In addition to prototype tests by the manufacturer, and prior to initial use, each new crane or derrick, or any crane or derrick which is structurally altered due to repair, modification or additions affecting the

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(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).		derrick's capacity or safe operation shall be inspected and tested by a ~~the~~ certified agent to insure compliance with the provisions of these orders, including the following functions where applicable: (1) Hoisting and lowering boom and load (2) Swing mechanism (3) Travel mechanisms, trolley, bridge, carrier (4) Limit switches, locking, and other safety devices
(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.	(c) 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. [Copied from 1619.2(g)(3)]
(ii) The test must consist of: (A) Hoisting the test load a few inches and holding to verify that the load is supported by the derrick and held by the hoist brake(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).	(1) The test shall consist of: (A) Hoisting the test load a few inches and holding to verify that the load is supported by the derrick and held by the hoist brake(s). (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).	[Copied from 1619.2(g)(3)]
(iii) The derrick must not be used unless the competent person determines that the test has	(2) The derrick shall not be used unless the certificating agency determines that the test has	[Copied from 1619.2(g)(3)]

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been passed.	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.	(d) 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 Articles 99 and 100.	
(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.]	§5020. Operational Testing. (a) In addition to prototype tests by the manufacturer, and prior to initial use, each new crane or derrick, or any crane or derrick which is structurally altered due to repair, modification or additions affecting the derrick's capacity or safe operation shall be inspected and tested by a the certified agent to insure compliance with the provisions of these orders, including the following functions… *** §5022. Proof Load Test and Examination of Cranes and Their Accessory Gear. (a) Proof load tests of cranes shall be carried out at the following intervals: *** (3) In the case of major modifications or repairs to important structural components, before they are returned to service. *** §5023. Proof Load Test and Examination of Derricks and Their Accessory Gear. (a) Proof load tests of derricks shall be carried out at the same intervals as specified in Section 5022(a) for cranes. ***	Equivalence provided by sections 5020, 5022 and 5023 as shown in center column.
(j) Power failure procedures. If power fails during operations, the derrick operator must safely stop operations. This must include:	§5008. Operating Practices. *** (g) If power fails during operation, the operator	

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(1) Setting all brakes or locking devices. (2) Moving all clutch and other power controls to the off position.	shall be required to: (1) Set all brakes and locking devices; (2) Move all clutch or 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.]	§4962.1. Use of winch heads. (a) Ropes shall not be handled on a winch head without the knowledge of the operator. (b) While a winch head is being used, the operator shall be within reach of the power unit control lever.	
(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.	§4960.3 ~~Construction~~ Securing the boom. (a) ~~(c)~~ When the boom is being held in a fixed position, dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. ~~When not in use the derrick boom shall:~~ (b) When ~~not in use~~ taken out of service for 30 days or more, the derrick boom shall be secured by one of the following methods: (1) Be laid down; (2) Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block; or (3) For guy derricks, be hoisted to a vertical position and secured to the mast. (4) For stiffleg derricks, secured against the stiffleg.	Relocated from 4960(c) and modified with federal verbiage.
(n) The process of jumping the derrick must be supervised by the A/D director.	§5010.1. Assembly/Disassembly - General Requirements (applies to all assembly and disassembly operations). (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	Section 5010.1 applies to cranes and derricks.

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	qualified person, or by a competent person who is assisted by one or more qualified persons (''A/D director'').	
(o) Derrick operations must be supervised by a competent person.	§4959. Operation – Procedures. *** (b) Derrick operations shall be supervised by a competent person.	
(p) Inspections. In addition to the requirements in § 1926.1412, the following additional items must be included in the inspections: (1) Daily: Guys for proper tension. (2) Annual. (i) Gudgeon pin for cracks, wear, and distortion. (ii) Foundation supports for continued ability to sustain the imposed loads.	§4960.4. Inspections. In addition to the requirements in Articles 99 and 100, the following additional items shall be included in the inspections: (a) Daily: Guys for proper tension. (b) Annual. (1) Gudgeon pin for cracks, wear, and distortion. (2) 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.	§5006. Crane and Hoisting Equipment Operators - Qualifications. (a) Only employees authorized by the employer and trained in the safe operation of cranes or hoisting apparatus shall be permitted to operate such equipment. *** Exceptions: *** 2. Cranes and derricks in construction regulated by Section 5006.2.	
§ 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.	**Article 97.1. 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).	§4988.0. Purpose. This Article 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	§4988.1. Scope. The sections of this Article apply to floating cranes/derricks and land	

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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.	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.	§4988.2. General requirements. The requirements in sections 4988.3 through 4988.8 apply to both floating cranes/ derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	
(c) Work area control. (1) The requirements of § 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.	§4988.3. Work area control. (a) The requirements of §4993.1 (Work area control) apply, except for §4993.1(a)(2)(B). (b) The employer shall either: (1) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or (2) 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.		California elects to retain requirements for protection from overhead loads found in Section 5002 (state counterpart for 1926.1425)
(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	§4988.4. Additional safety devices. In addition to the safety devices listed in §5017, the following safety devices are required: (1) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device	

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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.	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. (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.	§4988.5. Operational aids. (1) An anti-two-block device is required only when hoisting personnel or hoisting over an occupied cofferdam or shaft. (2) Section 5018(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.	*AC: do we want to keep this federal verbiage?*
(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.	§4988.6. Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of §5008.1(b) apply. If the crane/derrick does not have a cab, the employer shall ensure that: (a) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with pendant-controlled equipment), the load charts are posted on the equipment. (b) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, shall be readily available on board the vessel/ flotation device.	
(h) Inspections.	§4988.7. Inspections.	

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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:	In addition to meeting the requirements of Articles 99 and 100 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.	(a) Shift. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension.	
(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.	(b) Monthly. For each monthly inspection: (1) 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. (2) The vessel/flotation device is not taking on water. (3) The deck load is properly secured. (4) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (5) 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	(c) The shift and monthly inspections are conducted by a competent person, and: (1) If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard. (2) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been	

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corrected.	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. (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	(d) Annual. External vessel/flotation device inspection. For each annual inspection: (1) 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 the inspection includes the following items: (A) The items identified in subsection (a) (Shift) and (b) (Monthly) of this section. (B) Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items. (C) External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device. (D) Four-corner draft readings. (E) Firefighting equipment for serviceability. (2) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition. (3) 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	

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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.	§5008.1(e). (B) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.	
(5) Four-year: internal vessel/flotation device inspection. For each four-year inspection: (i) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation. (ii) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. (A) If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. (B) If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.	(e) Four-year: internal vessel/flotation device inspection. For each four-year inspection: (1) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation. (2) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. (A) If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. (B) If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.	
(6) Documentation. The monthly and annual inspections required in paragraphs (h)(2) and (h)(4) of this section 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	(f) Documentation. The monthly and annual inspections required in subsections (b) and (d) are documented in accordance with sections 5031(b)(3)(C) and 5031(c)(8) respectively, and that the four-year inspection required in subsection (e) is documented in accordance	

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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.]	with §5031(c)(8), 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 Articles 99 and 100.	
(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.	Section 6060(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 ~~Construction Safety Orders 1617.1-1617.3~~ Sections 5001 through 5001.2 (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 ~~Construction Safety Orders, Section 1619.3(n)(5)~~ section 4988.10(e)] shall not allow any amount of shifting in any direction.	California proposes to amend T8 Section 6060 which pertains to commercial diving to address the federal issues shown here.
(k) Manufacturer's specifications and	§4988.8. Manufacturer's specifications and	

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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 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.]	limitations. (a) The employer shall ensure that the barge, pontoons, vessel, or other means of flotation shall be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations. (b) The employer shall ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (c) When the manufacturer's specifications and limitations are unavailable, the employer shall ensure that the specifications and limitations established by a qualified person with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.	
(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	§4988.9. Floating cranes/derricks. For equipment designed by the manufacturer (or employer) for marine use by permanent attachment to barges, pontoons, vessels or other means of flotation: (a) Load charts. (1) 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.	

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<table>
<tr><th>FEDERAL: §</th><th>STATE:</th><th>RATIONALE</th></tr>
<tr><td>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.</td><td>(2) The employer shall ensure that load charts take into consideration a minimum wind speed of 40 miles per hour.
(b) The employer shall ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.</td><td></td></tr>
<tr><td>TABLE M1<table><tr><th>Rated Capacity</th><th>Maximum Allowable List (degrees)</th><th>Maximum Allowable Trim (degrees)</th></tr><tr><td>Equipment designed for marine use by permanent attachment (other than derricks):</td><td></td><td></td></tr><tr><td>25 tons or less</td><td>5</td><td>5</td></tr><tr><td>Over 25 tons</td><td>7</td><td>7</td></tr><tr><td>Derricks designed for marine use by permanent attachment:</td><td></td><td></td></tr><tr><td>Any rated capacity</td><td>10</td><td>10</td></tr></table></td><td>TABLE M1<table><tr><th>Rated Capacity</th><th>Maximum Allowable List (degrees)</th><th>Maximum Allowable Trim (degrees)</th></tr><tr><td>Equipment designed for marine use by permanent attachment (other than derricks):</td><td></td><td></td></tr><tr><td>25 tons or less</td><td>5</td><td>5</td></tr><tr><td>Over 25 tons</td><td>7</td><td>7</td></tr><tr><td>Derricks designed for marine use by permanent attachment:</td><td></td><td></td></tr><tr><td>Any rated capacity</td><td>10</td><td>10</td></tr></table></td><td></td></tr>
<tr><td>(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.)</td><td>(c) 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.)</td><td></td></tr>
<tr><td>TABLE M2<table><tr><th>Operated at</th><th>Wind speed (mph)</th><th>Minimum freeboard (ft)</th></tr><tr><td>Rated capacity</td><td>60</td><td>2</td></tr><tr><td>Rated capacity plus 25%</td><td>60</td><td>1</td></tr></table></td><td>TABLE M2<table><tr><th>Operated at</th><th>Wind speed (mph)</th><th>Minimum freeboard (ft)</th></tr><tr><td>Rated capacity</td><td>60</td><td>2</td></tr><tr><td>Rated capacity plus 25%</td><td>60</td><td>1</td></tr></table></td><td></td></tr>
</table>

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<table><tr><td>High boom, no load</td><td>60</td><td>2</td></tr></table> TABLE M3 <table><tr><th>Operated at</th><th>Wind speed (mph)</th></tr><tr><td>For backward stability of the boom: High boom, no load, full back list (least stable condition)</td><td>90</td></tr></table>	<table><tr><td>High boom, no load</td><td>60</td><td>2</td></tr></table> TABLE M3 <table><tr><th>Operated at</th><th>Wind speed (mph)</th></tr><tr><td>For backward stability of the boom: High boom, no load, full back list (least stable condition)</td><td>90</td></tr></table>	
(4) If the equipment is employer made, it must not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of paragraphs (m)(1) through (3) of this section. Such documents must be signed by a registered professional engineer who is a qualified person with respect to the design of this type of equipment (including the means of flotation).	(d) If the equipment is employer-made, it shall not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of subsections (a) through (c). 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.	(e) The employer shall ensure that the barge, pontoons, vessel or other means of flotation used: (1) 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. (2) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect. (3) 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	§4988.10. Land cranes/derricks. For land cranes/derricks used on barges, pontoons,	

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other means of flotation, the employer must ensure that: (1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (i) Account for increased loading from list, trim, wave action, and wind. (ii) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered. (iii) The conditions required in paragraphs (n)(3) and (n)(4) of this section are met.	vessels or other means of flotation, the employer shall ensure that: (a) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (1) Account for increased loading from list, trim, wave action, and wind. (2) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered. (3) The conditions required in subsections (c) and (d) 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.	(b) The rated capacity modification required in subsection (a) 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.	*AC: should a "qualified person" be able to do this?*
(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.	(c) For list and trim. (1) 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 (d) are met. In addition, the maximum allowable list and the maximum allowable trim shall not exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person. (2) The maximum allowable list and the	*DOSH: should "qualified person" be changed to "certificating agency"? Also, see (e)(5) below.*

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(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.	maximum allowable trim for the land crane/derrick shall not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.	
(4) For the following conditions: (i) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water. (ii) The entire bottom area of the barge, pontoons, vessel or other means of flotation used is submerged.	(d) For the following conditions: (1) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water. (2) The entire bottom area of the barge, pontoons, vessel or other means of flotation used is submerged.	
(5) Physical attachment, corralling, rails system and centerline cable system 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.	(e) Physical attachment, corralling, rails system and centerline cable system meet the requirements in Option (1), Option (2), Option (3), or Option (4) of this section, and that whichever option is used also meets the requirements of subsection (e)(5).	
(i) Option (1)—Physical attachment. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment.	(1) 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).	(2) Option (2) – Corralling. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers	

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Employers must ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.	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.	(3) 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 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.	(4) Option (4) – Centerline cable system. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The employer shall ensure that the wire rope system meets the following requirements: (A) The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick. (B) The wire rope is attached physically to the vessel/flotation device. (C) The wire rope is attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/ flotation device for repositioning. (D) Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments. (E) The crane/derrick is secured from movement during operation.	
(v) The systems/means used to comply with Option (1), Option (2), Option (3), or Option	(5) The systems/means used to comply with Option (1), Option (2), Option (3), or Option	

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(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.	(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 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.	Exception for subsection (e): For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by subsection (e) to use Option (1), Option (2), Option (3), or Option (4) does not apply when the employer demonstrates implementation of a plan and procedures that meet the following requirements: (1) 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. (2) 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. (3) 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. (4) The deck is marked to identify the permitted areas for positioning, travel, and operation. (5) The plan specifies the dynamic and environmental conditions that must be present for use of the plan. (6) If the dynamic and environmental	*DOSH: Do we want to allow this exception?*

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(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.	conditions in requirement (5) are exceeded, the mobile auxiliary crane shall be attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of subsection (e).	
(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 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.	(f) The barge, pontoons, vessel or other means of flotation used: (1) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments. (2) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (3) Have access to void compartments to allow for inspection and pumping.	
§ 1926.1438 Overhead & gantry cranes.	**Article 92.1. Supplemental Requirements for Overhead & Gantry Cranes Used in Construction.**	
(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.	§4915. Permanently installed overhead and gantry cranes. The requirements of 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.	Title modified to avoid over-reach; this 1926 requirement is for construction. Verbiage taken from previously approved 1619.4. *Question for AC: How can permanently installed gantry and overhead cranes not be GI? Is section 4915 necessary?*
(b) Overhead and gantry cranes that are not permanently installed in a facility. (1) This paragraph applies to the following	§4916. Overhead and gantry cranes that are not permanently installed in a facility. (a) This section applies to the following	

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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.	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 paragraph (b)(1) of this section: (i) Sections 1926.1400 through 1926.1414; §§ 1926.1417 through 1926.1425; § 1926.1426(d), §§ 1926.1427 through 1926.1434; § 1926.1437, § 1926.1439, and § 1926.1441.	(b) The requirements of Group 13 apply to equipment identified this section as appropriate except the following sections: Sections 5002.1(a) through (c), Article 95 and Article 96.	Rather than list the 90% of the sections which DO apply, CA proposes to list by exception the 10% that DO NOT apply (easier for stakeholders to understand and apply). *AC: is this section necessary? Group 13 should apply where appropriate.*
(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.		Since CSO is being recombined with GISO, there is no need to call-out specific sections of the GISO. They all apply as appropriate. *Review with AC.*
(B) The definitions in § 1910.179(a) except for ''hoist'' and ''load.'' For those words, the definitions in § 1926.1401 apply.		Subsection on definitions is unnecessary. These definitions have been incorporated into Section 4885 which applies to GISO Group 13.
(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.		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–		CA cannot apply a 2005 standard retroactively. B30.2 applies to all equipment manufactured on or after July 7, 2011.

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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.’’		
§ 1926.1439 Dedicated pile drivers.	**CSO Article 12. Pile Driving and Pile Extraction.** **§1600.2. Dedicated pile drivers.**	
(a) The provisions of subpart CC apply to dedicated pile drivers, except as specified in this section.	(a) The provisions of General Industry Safety Orders, Group 13, apply to dedicated pile drivers, except as specified in this section.	
(b) Section 1926.1416(d)(3) (Anti twoblocking device) does not apply.	(b) Section 5018(d)(3) (Anti two-blocking device) does not apply.	
(c) Section 1926.1416(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after November 8, 2011.	(c) Section 5018(e)(4)(A) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after July 7, 2011.	Effective date copied from CSO 1619.5(c)
(d) In § 1926.1433, only §§ 1926.1433(d) and (e) apply to dedicated pile drivers.	§5021. 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 (annual and quadrennial) attesting to current compliance with testing and examination standards of requirements shall be	Section 5021 amended include clamshells, draglines and pile drivers in testing and certification requirements as required by 1926.1400(b).

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	maintained for each crane or derrick and shall be in a form acceptable to 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:~~ ~~NOTE: (1) Clamshells, draglines and other similar equipment used for casting-type work;~~ ~~NOTE: (2) Pile drivers, other than those using gravity (drop) hammers.~~	
§ 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 July 7, 2011, and until [effective date] the provisions of ~~this~~ Construction Safety Orders, 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). On or after [effective date], the provisions of General Industry Safety Orders, Group 13, apply except §4991.1 (Ground conditions), §5017 (Safety devices), §5018 (Operational aids), and §§5006 through 5006.2 (Operator qualification and certification).	Effective date will be effective date of these orders (TBD).
(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 5002.1 ~~1616.5~~ (Free fall and controlled load lowering) applies, except Section 5002.1(a)(2)(A) ~~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 July 7, 2011.	
(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’’).	(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”).	

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(2) Section 14–1.3 (‘‘Side Boom Tractor Travel’’). (3) Section 14–1.5 (‘‘Ropes and Reeving Accessories’’). (4) Section 14–1.7.1 (‘‘Booms’’). (5) Section 14–1.7.2 (‘‘General Requirements—Exhaust Gases’’). (6) Section 14–1.7.3 (‘‘General Requirements—Stabilizers (Wheel-Type Side Boom Tractors)’’). (7) Section 14–1.7.4 (‘‘General Requirements—Welded Construction’’). (8) Section 14–1.7.6 (‘‘General Requirements—Clutch and Brake Protection’’). (9) Section 14–2.2.2 (‘‘Testing—Rated Load Test’’), except that it applies only to equipment that has been altered or modified. (10) In section 14–3.1.2 (‘‘Operator Qualifications’’), paragraph (a), except the phrase ‘‘When required by law.’’ (11) In section 14–3.1.3 (‘‘Operating Practices’’), paragraphs (e), (f)(1)—(f)(4), (f)(6), (f)(7), (h), and (i). (12) In section 14–3.2.3 (‘‘Moving the Load’’), paragraphs (j), (l), and (m).	(2) Section 14-1.3 (“Side Boom Tractor Travel”). (3) Section 14-1.5 (“Ropes and Reeving Accessories”). (4) Section 14-1.7.1 (“Booms”). (5) Section 14-1.7.2 (“General Requirements - Exhaust Gases”). (6) Section 14-1.7.3 (“General requirements - Stabilizers (Wheel-Type Side Boom Tractors)”). (7) Section 14-1.7.4 (“General Requirements - Welded Construction”). (8) Section 14-1.7.6 (“General Requirements - Clutch and Brake Protection”). (9) Section 14-2.2.2 (“Testing - Rated Load Test”), except that it applies only to equipment that has been altered or modified. (10) In section 14-3.1.2 (“Operator Qualifications”), paragraph (a), except the phrase “When required by law.” (11) In section 14-3.1.3 (“Operating Practices”), paragraphs (e), (f)(1)-(f)(4), (f)(6), (f)(7), (h), and (i). (12) In section 14-3.2.3 (“Moving the Load”), paragraphs (j), (l), and (m).	
§ 1926.1441 Equipment with a rated hoisting/ lifting capacity of 2,000 pounds or less.	**§4883. 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 sections 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	(a) The employer using this equipment shall comply with the following provisions of Group	

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subpart: § 1926.1400 (Scope); § 1926.1401 (Definitions); § 1926.1402 (Ground conditions); § 1926.1403 (Assembly/disassembly—selection of manufacturer or employer procedures); § 1926.1406 (Assembly/disassembly—employer procedures); §§ 1926.1407 through 1926.1411 (Power line safety); § 1926.1412(c) (Post-assembly); §§ 1926.1413 through 1926.1414 (Wire rope); § 1926.1418 (Authority to stop operation); §§ 1926.1419 through 1926.1422 (Signals); § 1926.1423 (Fall protection); § 1926.1425 (Keeping clear of the load) (except for § 1926.1425(c)(3) (qualified rigger)); § 1926.1426 (Free fall and controlled load lowering); § 1926.1432 (Multiple crane/derrick lifts – supplemental requirements); § 1926.1434 (Equipment modifications); § 1926.1435 (Tower cranes); § 1926.1436 (Derricks); § 1926.1437 (Floating cranes/derricks and land cranes/derricks on barges); § 1926.1438 (Overhead & gantry cranes).	13: §§4880-4881 (Scope & General); §4885 (Definitions); §4991.1 (Ground conditions); §5010 (Assembly/disassembly—selection of manufacturer or employer procedures); §5010.3 (Assembly/disassembly—employer procedures); §§5003.1, 5003.2, 5003.3, 5003.4, and 5010.4 (Power line safety); §5031.2 (Post-assembly); §§5031 and 5036-5037 (Wire rope); §5008(c) (Authority to stop operation); §§5001 through 5001.2 (Signals); §5011 (Fall protection); §5002 (Keeping clear of the load) (except for §5002(c)(3) (qualified rigger)); §5002.1 (Free fall and controlled load lowering); §4994 (Multiple crane/derrick lifts—supplemental requirements); §4884.1 (Equipment modifications); §§ 4965, 4965.1, 4966, 4968-4968.2 (Tower cranes); §§ 4959 through 4962.1, 5006, 5020, 5022, and 5023 (Derricks); Article 97.1 (Floating cranes/derricks and land cranes/derricks on barges); Article 92.1 (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).	(b) Assembly/disassembly. (1) In addition to compliance with §§5010 (Assembly/disassembly—selection of manufacturer or employer procedures) and 5010.3 (Assembly/disassembly—employer procedures), the employer shall also comply with §4883(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	(2) Components and configuration. The employer shall ensure that: (A) The selection of components, and the configuration of the equipment, that affect the	

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capacity or safe operation of the equipment complies with either the: (A) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or (B) Approved modifications that meet the requirements of § 1926.1434 (Equipment modifications). (ii) Post-assembly inspection. Upon completion of assembly, the equipment is inspected to ensure that it is in compliance with paragraph (b)(2)(i) of this section (see § 1926.1412(c) for post-assembly inspection requirements).	capacity or safe operation of the equipment complies with either the: (i) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a certified agent 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 §4884.1 (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) (see §5031.2 for post-assembly inspection requirements).	
(3) Manufacturer prohibitions. The employer must comply with applicable manufacturer prohibitions.	(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.	(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 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	(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	

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capacity of the equipment are developed and signed by a registered professional engineer familiar with the equipment.	capacity of the equipment are developed and signed by a certified agent familiar with the equipment.	
(3) Accessibility. The employer must ensure that: (i) The load chart is available to the operator at the control station; (ii) Procedures applicable to the operation of the equipment, recommended operating speeds, special hazard warnings, instructions, and operator's manual are readily available for use by the operator. (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.	(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 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).	(2) Anti two-blocking. The employer shall ensure that equipment covered by this section manufactured more than one year after July 7, 2012 have either an anti-two-block device that meets the requirements of §5018(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).	

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(e) Operator qualifications. The employer must train each operator, prior to operating the equipment, on the safe operation of the type of equipment the operator will be using.	(e) Operator qualifications. Section 5006 shall apply to operation of equipment with a rated hoisting/ lifting capacity of 2,000 pounds or less.	Clarify application of existing section 5006 which is more protective.
(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.]		This is duplicative; it is already required by Section 4883(a) [1926.1419-1422] and section 3203.
(h) Inspections. The employer must ensure that equipment is inspected in accordance with manufacturer procedures. (i) [Reserved.]	(f) Inspections. The employer shall ensure that equipment is inspected in accordance with manufacturer procedures.	
(j) Hoisting personnel. The employer must ensure that equipment covered by this section is not used to hoist personnel.	(g) Hoisting personnel. Equipment covered by this section shall not be used to hoist personnel.	
(k) Design. The employer must ensure that the equipment is designed by a qualified engineer.	(h) Design. The employer shall ensure that the equipment is designed by a qualified engineer.	
§ 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.