SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
§ 1926.1427 Operator qualification and certification. (a) The employer must ensure that, prior to operating any equipment covered under subpart CC, the person is operating the equipment during a training period in accordance with paragraph (f) of this section, or the operator is qualified or certified to operate the equipment in accordance with the following: (1) When a non-military government entity issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements of paragraphs (e)(2) and (j) of this section, the equipment operator must either be: (i) licensed by that government entity for operation of equipment within that entity's jurisdiction; or (ii) qualified in compliance with paragraph (d) of this section. (2) Where paragraph (a)(1) of this section is not applicable, the certification or qualification must comply with one of the options in paragraphs (b) through (d) of this section. (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-rate hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441). (4) Whenever operator qualification or certification is required under § 1926.1427, the employer must provide the qualification or certification at no cost to operators who are employed by the employer on November 8, 2010.	***Amend Section 5006. Operators—Qualification, to read:*** (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. (b) Trainees may be authorized to operate cranes or hoisting apparatus provided they are under the supervision of a qualified operator. ~~Exception: Mobile and tower cranes regulated by Section 5006.1.~~	As a generic rule, the State requires the operator's of all cranes and hoisting apparatus to be trained and qualified and permits trainees to operate such equipment only when they are under the direct supervision of a qualified operator (see proposed Section5006.1(e). All mobile and all tower cranes are regulated under Section 5006.1 with regard to operator qualifications and certification.
§ 1926.1427 Operator qualification and certification. (a) The employer must ensure that, prior to		

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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: (1) When a non-military government entity issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements of paragraphs (e)(2) and (j) of this section, the equipment operator must either be: (i) licensed by that government entity for operation of equipment within that entity's jurisdiction; or (ii) qualified in compliance with paragraph (d) of this section. (2) Where paragraph (a)(1) of this section is not applicable, the certification or qualification must comply with one of the options in paragraphs (b) through (d) of this section. (3) Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see § 1926.1436), sideboom cranes (see § 1926.1440), or equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441). (4) Whenever operator qualification or certification is required under § 1926.1427, the employer must provide the qualification or certification at no cost to operators who are employed by the employer on November 8, 2010. **§ 1926.1427 Operator qualification and certification.** (a) The employer must ensure that, prior to operating any equipment covered under subpart CC, the person is operating the equipment during a training period in	*Amend Section 5006.1 to read:* *§5006.1. ~~Mobile Crane and Tower Crane~~-Operator Qualifications and Certification.* (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. Whenever operator qualification or certification is required under Section 5006.1 the employer shall provide the qualification or certification at no cost to operators who are employed by the employer on [Effective date]. Certificates shall be issued to operators who: (1) Pass a physical examination conducted by a physician which at a minimum shall include the examination criteria specified in the American Society of Mechanical Engineers (ASME) B30.5-2000 standard, Chapter 5-3.1.2(a)(1-5, 7, 8) or the U.S. Department of Transportation (US DOT) physical examination requirements contained in 49 CFR Sections 391.41 through 391.49. (2) Pass a substance abuse test. The level of testing shall be consistent with the standard practice for the industry where the crane is in use and this test shall be conducted by a recognized laboratory service; (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: * * * * * EXCEPTIONS TO SECTION 5006.1: (1) ~~Mobile cranes having a boom length of less than 25 feet or~~ 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 ~~rated load capacity~~ of ~~less than 15,000 pounds~~ 2000 pounds or less. * * * * *	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical (hands-on) exam, third party testing, refresher training and operators in training in Section 5006.1. The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commision for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
accordance with paragraph (f) of this section, or the operator is qualified or certified to operate the equipment in accordance with the following: (1) When a non-military government entity issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements of paragraphs (e)(2) and (j) of this section, the equipment operator must either be: (i) licensed by that government entity for operation of equipment within that entity's jurisdiction; or (ii) qualified in compliance with paragraph (d) of this section. (2) Where paragraph (a)(1) of this section is not applicable, the certification or qualification must comply with one of the options in paragraphs (b) through (d) of this section. (3) Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see § 1926.1436), sideboom cranes (see § 1926.1440), or equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441). (4) Whenever operator qualification or certification is required under § 1926.1427, the employer must provide the qualification or certification at no cost to operators who are employed by the employer on November 8, 2010. (b) *Option (1): Certification by an accredited crane operator testing organization*. (1) For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry	(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; (D) knowledge of chapters 5-0 through 5-3 of The American Society of Mechanical Engineers (ASME) B30.5-2000 and B30.5a-2002 Addenda to the standard for mobile and locomotive cranes or chapters 4-0 through 4-3 of the ASME B30.4-1996 standard for portal, tower, and pedestal cranes or Chapter 3-3 of the ASME B 30.3-1996 standard for Construction Tower Cranes, depending on the type of crane(s) the operator intends to operate. (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. Section 5006.1 (continued) (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. Whenever operator qualification or certification is required under Section 5006.1 the employer shall provide the qualification or certification at no cost to operators who are employed by the employer	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commision for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.

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recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel have been met. (ii) Administer written and practical tests that: (A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section.	on May 10, 2011. Certificates shall be issued to operators who: (1) Pass a physical examination conducted by a physician which at a minimum shall include the examination criteria specified in the American Society of Mechanical Engineers (ASME) B30.5-2000 standard, Chapter 5-3.1.2(a)(1-5, 7, 8) or the U.S. Department of Transportation (US DOT) physical examination requirements contained in 49 CFR Sections 391.41 through 391.49. (2) Pass a substance abuse test. The level of testing shall be consistent with the standard practice for the industry where the crane is in use and this test shall be conducted by a recognized laboratory service; (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;	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commision for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(b) *Option (1): Certification by an accredited crane operator testing organization*. (1) For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) Be accredited by a nationally recognized accrediting agency based on	Section 5006.1 (continued) (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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that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel have been met. (ii) Administer written and practical tests that: (A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section.	certification is sought; (D) knowledge of chapters 5-0 through 5-3 of The American Society of Mechanical Engineers (ASME) B30.5-2000 and B30.5a-2002 Addenda to the standard for mobile and locomotive cranes or chapters 4-0 through 4-3 of the ASME B30.4-1996 standard for portal, tower, and pedestal cranes or Chapter 3-3 of the ASME B 30.3-1996 standard for Construction Tower Cranes, depending on the type of crane(s) the operator intends to operate. (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.	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.

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(B) Provide different levels of certification based on equipment capacity and type. (iii) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified. (iv) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.	Section 5006.1(a)(3) (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: Section 5006.1(a)(3) (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:	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(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	(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. Whenever operator qualification or certification is required under Section 5006.1 the employer shall provide the qualification or certification at no cost to operators who are employed by the employer on May 10, 2011. Certificates shall be issued to operators who:	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and

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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.	* * * *	practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(3) A certification issued under this option is portable and meets the requirements of paragraph (a)(2) of this section. (4) A certification issued under this paragraph is valid for 5 years.	(b) 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 (a)(1)- (4) of this section.	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA

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		or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(c) *Option (2): Qualification by an audited employer program*. The employer's qualification of its employee must meet the following requirements: (1) The written and practical tests must be either: (i) Developed by an accredited crane operator testing organization (see paragraph (b) of this section); or (ii) Approved by an auditor in accordance with the following requirements: (A) The auditor is certified to evaluate such tests by an accredited crane operator testing organization (see paragraph (b) of this section). (B) The auditor is not an employee of the 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	(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: (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. (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:	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled

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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.	(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.	evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(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.	(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:	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1
(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.	(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.	The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate

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		assessment of the operators competency to operate the crane or hoisting apparatus.
(3) The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter. (4) The employer program must have testing procedures for re-qualification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. The requalification procedures must be audited in accordance with paragraphs (c)(1) and (2) of this section.	(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: (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.	The State addresses the issue of operator qualifications and certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(5) *Deficiencies.* If the auditor determines that there is a significant deficiency ("deficiency") in the program, the employer must ensure that:	(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	The State addresses the issue of operator qualifications and certification including but not limited

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(i) No operator is qualified until the auditor confirms that the deficiency has been corrected. (ii) The program is audited again within 180 days of the confirmation that the deficiency was corrected. (iii) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor's determination that there is a deficiency. (iv) Records of the audits of the employer's program are maintained by the auditor for three years and are made available by the auditor to the Secretary of Labor or 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.	a minimum, include the following: (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. (b) 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 (a)(1)- (4) of this section.	to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.
(d) *Option (3): Qualification by the U.S. military*. (1) For purposes of this section, an operator who is an employee of the U.S. military is considered qualified if he/she has a current operator qualification issued by the U.S. military for operation of the equipment. An employee of the U.S. military is a federal employee of the Department of Defense or Armed Forces		The Division of Occupational Safety and Health does not have jurisdiction on U.S. Military basis and other Federal facilities consequently this body of federal standards are irrelevant to California. Private Sector employers who perform work

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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.		on Federal property involving the use of cranes and hoisting equipment are subject to Title 8 crane operator qualification standards.
(e) *Option (4): Licensing by a government entity*. (1) For purposes of this section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane operator testing organization if the criteria in paragraph (e)(2) of this section are met. (2) *Licensing criteria*. (i) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section. (ii) The testing meets industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel. (iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i) and (ii) of this section have been met.		Government entities and local jurisdictions throughout California are subject to the same requirements of Section 5006.1 should they elect to become an accredited independent operator certification entity.
(iv) The licensing department/office has testing procedures for relicensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. (3) A license issued by a government		Government entities and local jurisdictions throughout California are subject to the same requirements of Section 5006.1 should they elect to become an accredited independent

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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.		carne and hoisting apparatus operator certification entity
(f) *Pre-qualification/certification training period*. An employee who is not qualified or certified under this section is permitted to operate equipment only as an operator-in training and only where the requirements of this paragraph are met. (1) The employer must provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in-training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer. (2) The tasks performed by the operator-in-training while operating the equipment must be within the operator-in-training's ability.	Amend Section 5006.1 to read: * * * * * (e) 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 section are met. (1) The employer shall provide each operator-in-training with sufficient training prior to operating the equipment to enable the operator-in-training to operate the equipment safely under limitations established by this section (including continuous monitoring) and any additional limitations established by the employer. (2) The tasks performed by the operator-in-training while operating the equipment shall be within the operator-in-training's ability.	The State proposes to amend Section 5006.1 to address the pre-qualification/certification training period.
(3) *Trainer*. While operating the equipment, the operator-in-training must be continuously monitored by an individual ("operator's trainer") who meets all of the following requirements: (i) The operator's trainer is an employee or agent of the operator-in-training's employer. (ii) The operator's trainer is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment's controls. (iii) While monitoring the operator-in-	5006.1(e) renumbered as 5006.1(e)(3): Trainees may be authorized to operate mobile or tower cranes 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.	Existing 5006.1(e) is ALAEA 1926.1428(f)(3). The supervision requirements for all types of cranes are the same (no exception for tower cranes)

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training. (iv) For equipment other than tower cranes: the operator's trainer and the operator-in-training must be in direct line of sight of each other. In addition, they must communicate verbally or by hand signals. For tower cranes: the operator's trainer and the operator-in-training must be in direct communication with each other. (4) *Continuous monitoring*. The operator-in-training must be monitored by the operator's trainer at all times, except for short breaks where all of the following are met: (i) The break lasts no longer than 15 minutes and there is no more than one break per hour. (ii) Immediately prior to the break the operator's trainer informs the operator-in-training of the specific tasks that the operator-in-training is to perform and limitations to which he/she must adhere during the operator trainer's break. (iii) The specific tasks that the operator-in-training will perform during the operator trainer's break are within the operator-in-training's abilities.		
(5) The operator-in-training must not operate the equipment in any of the following circumstances unless the exception stated in paragraph (f)(5)(v) of this section is applicable: (i) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone (see § 1926.1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV. (ii) If the equipment is used to hoist personnel. (iii) In multiple-equipment lifts.	Amend Section 5006.1 (e) to read: (e)(4) The operator-in-training shall not operate the equipment in any of the following circumstances ~~unless the exception stated in paragraph (f)(4)(D)(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 §5003.1(a)(1)], could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV. (2) If the equipment is used to hoist personnel. (3) In multiple-equipment lifts. (4) If the equipment is used over a cofferdam, or in a tank farm. (5) In multiple-lift rigging operations. EXCEPTION for (e)(4): Where the operator's trainer determines that the operator-in-training skills are sufficient for this high skill work.	The State proposes to amend Section 5006.1 to address the pre-qualification/certification training period

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(iv) If the equipment is used over a 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.		
(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.		The State does not training entities to conduct qualification testing due to inherent problems with conflict of interest and bias; unless the accrediting entity, NCCA or ANSI will allow it. This is ascertained by these entities on a case by case basis to ensure the validity of the test is not compromised.
(h) *Language and Literacy Requirements*. (1) Tests under this section may be administered verbally, with answers given verbally, where the operator candidate: (i) Passes a written demonstration of literacy relevant to the work. (ii) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification. (2) Tests under this section may be administered in any language the operator candidate understands, and the operator's certificate must note the language in which the test was given. The operator is qualified under paragraph (b)(2) of this section to operate equipment that is furnished with materials required by this subpart that are written in the language of the certification. The operator may only operate equipment furnished with such materials.		California requires written examinations (more protective).
(i) [*Reserved.*] (j) *Certification criteria.* Qualifications	(a) Qualifications. The employer shall only permit operators who have a valid certificate of competency (certificate) issued in accordance with this	The State addresses the issue of operator qualifications and

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
and certifications must be based, at a minimum, on the following: (1) A determination through a written test that: (i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including all of the following: (A) The controls and operational/performance characteristics. (B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment. (C) Procedures for preventing and responding to power line contact. (D) Technical knowledge similar to the subject matter criteria listed in Appendix C of this subpart applicable to the specific type of equipment the individual will operate. Use of the Appendix C criteria meets the requirements of this provision. (E) Technical knowledge applicable to: *(1)* The suitability of the supporting ground and surface to handle expected loads. *(2)* Site hazards. *(3)* Site access. (F) This subpart, including applicable incorporated materials. (ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i) of this section. 2) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following: (i) Ability to recognize, from visual and auditory observation, the items listed in § 1926.1412(d) (shift inspection). (ii) Operational and maneuvering skills. (iii) Application of load chart information. (iv) Application of safe shut-down and	section by an Accredited Certifying Entity for the type of crane to be used to operate a crane covered by this section. Whenever operator qualification or certification is required under Section 5006.1 the employer shall provide the qualification or certification at no cost to operators who are employed by the employer on [Effective date]. Certificates shall be issued to operators who: (1) Pass a physical examination conducted by a physician which at a minimum shall include the examination criteria specified in the American Society of Mechanical Engineers (ASME) B30.5-2000 standard, Chapter 5-3.1.2(a)(1-5, 7, 8) or the U.S. Department of Transportation (US DOT) physical examination requirements contained in 49 CFR Sections 391.41 through 391.49. (2) Pass a substance abuse test. The level of testing shall be consistent with the standard practice for the industry where the crane is in use and this test shall be conducted by a recognized laboratory service; (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) 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; (D) knowledge of chapters 5-0 through 5-3 of The American Society of Mechanical Engineers (ASME) B30.5-2000 and B30.5a-2002 Addenda	certification including but not limited to test, accreditation, physical qualifications and overall competencies via a written and practical exam, refresher training and operators in training in Section 5006.1 The State's Section 5006.1 also addresses accreditation by the NCCA or ANSI who subject accredited testing entities be they employers or third party testing groups such as the National Commission for the Certification of Crane Operators (NCCCO) to periodic, scheduled evaluation and reevaluation of their testing protocols to ensure that the testing entities is carrying out the operator testing in a scientifically valid and consistent manner such that the test results represent and accurate assessment of the operators competency to operate the crane or hoisting apparatus.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
securing procedures.	to the standard for mobile and locomotive cranes or chapters 4-0 through 4-3 of the ASME B30.4-1996 standard for portal, tower, and pedestal cranes or Chapter 3-3 of the ASME B 30.3-1996 standard for Construction Tower Cranes, depending on the type of crane(s) the operator intends to operate. (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*. (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) When § 1926.1427(a)(1) is not applicable, all of the requirements in paragraphs (k)(2)(i) and (ii) of this section apply until November 10, 2014: (i) The employer must ensure that operators of equipment covered by this standard are competent to operate the equipment safely. (ii) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employer must train that employee prior to operating the equipment. The employer must ensure that each operator is evaluated to confirm that he/she understands the information provided in the training.	Amend Section 5006.1 to read: (f) ~~Effective Date. The requirements of Section 5006.1 shall become effective on June 1, 2005.~~ Phase-in. (1) The provisions of this section are applicable [Effective date], except for subsections (a) through (e) which are applicable [Effective date plus four years] for cranes with a maximum manufacturer- rated hoisting/lifting capacity of over 2000 pounds to 14,999 pounds. (2) When Section 5006.1(a)-(d) are not applicable, all of the requirements in subsections (e) and (f)(2)(A) and (B) of this section apply. (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 provided in the training.	The State proposes to amend Section 5006.1 to follow the phase in date plan outlined in the Federal Standard. CA Currently requires operator certification for cranes with capacity 15,000# and greater, so the phase-in will only apply to cranes with capacity 2000#-14,999# .
§ 1926.1428 Signal person qualifications. (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. (1) *Option (1) – Third party qualified*	***Add new Section 5001.3 to read:*** §5001.3. Signal Person Qualifications. (a) The employer of the signal person shall ensure that each signal person meets the Qualification Requirements (subsection (c) of this section) prior to giving any signals. This requirement shall be met by using either Option (1) or Option (2) of this subsection. (1) Option (1) – Third party qualified evaluator. The signal person has documentation from a third party qualified evaluator [see Qualified Evaluator (third party), Section 4885 for definition]	The State proposes to add Section 5001.3 to follow the phase in date plan outlined in the Federal Standard.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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).	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. (3) The employer must make the documentation for whichever option is used available at the site while the signal person is employed by the employer. The documentation must specify each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of paragraph (c) of this section.	(2) Option (2) – Employer's qualified evaluator. The employer's qualified [see Qualified Evaluator (not a third party), Section 4885 for definition] evaluator assesses the individual and determines that the individual meets the Qualification Requirements [see subsection (c)] and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable – other employers are not permitted to use it to meet the requirements of this subsection. (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 each type of signaling (e.g. hand signals, radio signals, etc.) for which the signal person meets the requirements of subsection (c).	The State proposes to amend Section 5006.1 to follow the phase in date plan outlined in the Federal Standard.
(b) If subsequent actions by the signal person indicate that the individual does not meet the Qualification Requirements (see paragraph (c) of this section), the employer must not allow the individual to continue working as a signal person until re-training is provided and a re-assessment is made in accordance with paragraph (a) of this section that confirms that the individual meets the Qualification Requirements (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	(b) If subsequent actions by the signal person indicate that the individual does not meet the Qualification Requirements [see subsection (c)], the employer shall not allow the individual to continue working as a signal person until re-training is provided and a re-assessment is made in accordance with subsection (a) that confirms that the individual meets the Qualification Requirements. (c) Qualification Requirements. Each signal person shall: (1) Know and understand the type of signals used. If hand signals are used, the signal person shall know and understand the Standard Method for hand signals. (2) Be competent in the application of the type of signals used. (3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads. (4) Know and understand the relevant requirements of Section 5001 and this Section. (5) Demonstrate that he/she meets the requirements in subsections (c)(1) through (4) of this section through an oral or written test, and through a practical test.	The State proposes to amend Section 5006.1 to follow the phase in date plan outlined in the Federal Standard.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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.		
§ 1926.1429 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.	Add new Section 5038 to read: §5038. Qualifications of Maintenance and 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: (A) Operate the equipment under the direct supervision of an operator who meets the requirements of §5006.1 (Operator qualification and certification); or (B) Are familiar with the operation, limitations, characteristics and hazards associated with the type of equipment. (b) Maintenance and repair personnel shall meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.	California proposes to add Section 5038 to address the qualifications of maintenance and repair employees per the Federal standard.
§ 1926.1430 Training. The employer must provide training as follows:	§5006. Operators--Qualifications. (a) Only employees authorized by the employer and trained in the safe operation of cranes or hoisting	California requires qualified persons who have been authorized and trained by the employer to operate cranes and

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(a) *Overhead powerlines*. The employer must train each employee specified in § 1926.1408(g) and § 1926.1410(m) in the topics listed in § 1926.1408(g). (b) *Signal persons*. The employer must train each employee who will be assigned to work as a signal persons who does not meet the requirements of § 1926.1428(c) in the areas addressed in that paragraph. (c) *Operators*. (1) *Operators-in-Training for equipment where certification or qualification is required by this subpart*. The employer must train each operator-in-training in the areas addressed in § 1926.1427(j). The employer must provide re-training if the operator-in-training does not pass a qualification or certification test. (2) *Transitional Period*. During the four-year phase-in period for operator certification or qualification, as provided in § 1926.1427(k), employers must train each operator who has not yet been certified or qualified in the areas addressed in § 1926.1427(j). (3) *Operators excepted from the requirements of § 1926.1427*. The employer must train each operator excepted under § 1926.1427(a) from the requirements of § 1926.1427 on the safe operation of the equipment the operator will be using. (4) The employer must train each operator of the equipment covered by this subpart in the following practices: (i) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment with a boom, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary. See § 1926.1417(f) and (j) for additional requirements.	apparatus shall be permitted to operate such equipment. ***§5003. Provisions for Preventing Accidents in the Area of High-Voltage Lines.*** Provisions for preventing accidents due to overhead high-voltage lines shall be in conformance with the High-Voltage Electrical Safety Orders, Article 37. Section 3203 (a) (7) *** (7) Provide training and instruction: (A) When the program is first established; EXCEPTION: Employers having in place on July 1, 1991, a written Injury and Illness Prevention Program complying with the previously existing Accident Prevention Program in Section 3203. (B) To all new employees; (C) To all employees given new job assignments for which training has not previously been received; (D) Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard; (E) Whenever the employer is made aware of a new or previously unrecognized hazard; and, (F) For supervisors to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed. *** Section 3203 (a) (7) *** (7) Provide training and instruction: (A) When the program is first established; EXCEPTION: Employers having in place on July 1, 1991, a written Injury and Illness Prevention Program complying with the previously existing Accident Prevention Program in Section 3203. (B) To all new employees; (C) To all employees given new job assignments for which training has not previously been received; (D) Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard; (E) Whenever the employer is made aware of a new or previously unrecognized hazard; and, (F) For supervisors to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed. ***	hoisting apparatus. In addition California addresses the prevention of accidents involving energized overhead conductors by requiring all crane and hoisting apparatus operators to conform to the requirements of the High Voltage Electrical Safety Orders. In addition California's existing Injury and Illness Prevention Program, Section 3203 and the Title 8 Construction industry version in Section 1509 address the employers responsibility and duty to provide and document all employee training necessary to perform the work safely. California requires qualified persons who have been authorized and trained by the employer to operate cranes and hoisting apparatus. In addition California addresses the prevention of accidents involving energized overhead conductors by requiring all crane and hoisting apparatus operators to conform to the requirements of the High Voltage Electrical Safety Orders. In addition California's existing Injury and Illness Prevention Program, Section 3203 and the Title 8 Construction industry version in

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement		Section 1509 address the employers responsibility and duty to provide and document all employee training necessary to perform the work safely.
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).	Section 3203 (a) (7) *** (7) Provide training and instruction: (A) When the program is first established; EXCEPTION: Employers having in place on July 1, 1991, a written Injury and Illness Prevention Program complying with the previously existing Accident Prevention Program in Section 3203. (B) To all new employees; (C) To all employees given new job assignments for which training has not previously been received; (D) Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard; (E) Whenever the employer is made aware of a new or previously unrecognized hazard; and, (F) For supervisors to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed. ***	California requires qualified persons who have been authorized and trained by the employer to operate cranes and hoisting apparatus. In addition California's existing Injury and Illness Prevention Program, Section 3203 and the Title 8 Construction industry version in Section 1509 address the employers responsibility and duty to provide and document all employee training necessary to perform the work safely.
(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).	Section 3314 (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 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. (4) Such training shall be documented as required by Section 3203.	California requires qualified persons who have been authorized and trained by the employer to operate cranes and hoisting apparatus. In addition California's existing Injury and Illness Prevention Program, Section 3203 and the Title 8 Construction industry version in Section 1509 address the employers responsibility and duty to provide and document all employee training necessary to perform the work safely.
(g) *Training administration*. (1) The employer must evaluate each	Add new Section 4884.3 to read: 4884.3. Training - Administration.	California proposes to add new Section 4884.3 to address training

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926 SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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	(1) The employer shall evaluate each employee required to be trained under Group 13 and these Orders to confirm that the employee understands the information provided in the training. (2) The employer shall provide refresher training in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary. (3) Whenever training is required under Group 13, the employer shall provide the training at no cost to the employee.	administration per the federal standard.
§ 1926.1431 Hoisting personnel. The requirements of this section are supplemental to the other requirements in this subpart and apply when one or more employees are hoisted. (a) The use of equipment to hoist employees is prohibited except where the employer demonstrates that the erection, use, and dismantling of conventional means of reaching the work area, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. This paragraph does not apply to work covered by subpart R (Steel Erection) of this part.	§5004. Crane or Derrick Suspended Personnel Platforms. (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 or on boom attached personnel platforms. (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 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.	California's standards pertaining to the use of crane or derrick suspended personnel platforms are contained in Section 5004 of the GISO. Boom-attached personnel platforms added per 1926.1431(d)(2).
(b) *Use of personnel platform*. (1) When using equipment to hoist employees, the employees must be in a personnel platform that meets the requirements of paragraph (e) of this section. (2) *Exceptions*: A personnel platform is not required for hoisting employees: (i) Into and out of drill shafts that are up to and including 8 feet in diameter (see paragraph (o) of this section for requirements for hoisting these employees). (ii) In pile driving operations (see	Amend Section 5004 to read: (k) Work Practices (9) When using equipment to hoist employees, the employees must be in a personnel platform that meets the requirements of Section (h) and (i) of these Orders. 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 (k)(13) for requirements for hoisting these employees).	California proposes to amend Section 5004 to address work practices per the Federal standard.

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
paragraph (p) of this section for requirements for hoisting these employees). (iii) Solely for transfer to or from a marine worksite in a marine-hoisted personnel transfer device (see paragraph (r) of this section for requirements for hoisting these employees). (iv) In storage-tank (steel or concrete), shaft and chimney operations (see paragraph (s) of this section for requirements for hoisting these employees).	(2) In pile driving operations (see Section 5004(d) 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 (k)(18) for requirements for hoisting these employees). (4) In storage-tank (steel or concrete), shaft and chimney operations (see subsection (k)(19) for requirements for hoisting these employees).	California proposes to amend Section 5004 to address work practices per the Federal standard. The Federal paragraph (b)(2)(iii) is addressed in the preceding rationale (see above).
(c) *Equipment set-up*. (1) The equipment must be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable. (2) Equipment with outriggers or stabilizers must have them all extended and locked. The amount of extension must be the same for all outriggers and stabilizers and in accordance with manufacturer procedures and load charts.	Amend Section 5004(d)(4) to read: ***** (4) The crane shall be uniformly level within one percent of level grade, and located on firm footing that a qualified person has determined to be sufficiently firm and stable. ~~Cranes equipped~~ Equipment with outriggers or stabilizers shall have them all extended and locked. The amount of extension shall be the same for all outriggers and stabilizers and in accordance with the manufacturer procedures and load charts. ~~fully deployed following manufacturer's specifications, insofar as applicable, when hoisting employees.~~	The State proposes to amend Section 5004(d)(4) to address equipment set up per the Federal standard.
(d) *Equipment criteria*. (1) *Capacity: use of suspended personnel platforms*. The total load (with the platform loaded, including the hook, load line and rigging) must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing. (2) *Capacity: use of boom-attached personnel platforms*. The total weight of the loaded personnel platform must not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing).	Section 5004(d)(5): (5) 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. §5004. Crane or Derrick Suspended Personnel Platforms. (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 or on boom-attached personnel platforms.	California requires the total weight of the loaded platform regardless if it is a suspended platform suspended by a boom or not to not exceed 50% of the rated load according to the rated capacity for the radius and configuration of the crane or derrick. S.5004(a) amended to include boom-attached personnel platforms.

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(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. (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.	Section 5004(d)(5) (5) 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. (d)(3) (3) Load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs shall be engaged when the occupied personnel platform is in a stationary working position	California requires the total weight of the loaded platform regardless if it is a suspended platform suspended by a boom or not to not exceed 50% of the rated load according to the rated capacity for the radius and configuration of the crane or derrick.
(5) *Devices*. (i) Equipment (except for derricks and articulating cranes) with a variable angle boom must be equipped with all of the following: (A) A boom angle indicator, readily visible to the operator, and (B) A boom hoist limiting device. (ii) Articulating cranes must be equipped with a properly functioning automatic overload protection device. (iii) Equipment with a luffing jib must be equipped with: (A) A jib angle indicator, readily visible to the operator, and. (B) A jib hoist limiting device. (iv) Equipment with telescoping booms must be equipped with a device to indicate the boom's extended length clearly to the operator, or must have measuring marks on the boom.	Amend S. 5004 to read: (e) Instruments and Components. (1) Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator. (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. (3)(A) An anti two-block device shall be used which when activated, disengages all crane functions that can cause two-blocking. The device(s) shall prevent such damage failure at all points where two-blocking could occur. EXCEPTION: This device is not required when hoisting personnel in pile driving operations. Instead Section 5004(k)(14) specifies how to prevent two-blocking during such operations. (B) When a derrick is used to hoist personnel platforms, limiting devices shall be installed to prevent two-blocking. (4) The load line hoist drum shall have a 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). 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. (5) A boom hoist limiting device. (6) Articulating cranes shall be equipped with a properly functioning automatic overload protection device. (7) Equipment with a luffing jib shall be equipped with: (A) A jib angle indicator, readily visible to the operator, and, (B) A job hoist limiting device	California addresses crane and derrick instruments and components when used in situations where a suspended personnel platform is used to comply with the requirements of Section 5004. California proposes to amend Section 5004 to address anti two-blocking and the Federal exception. In addition, California proposes to amend Section 5004(e)(4) to address the device issues stated in the Federal standard.
(v) *Anti two-block*. A device which automatically prevents damage and load failure from contact between the load	S. 5004 (e)(3)(A) An anti two-block device shall be used which when activated, disengages all crane functions that can cause two-blocking. The device(s)	As stated earlier, California proposes to amend Section 5004 to address anti two-blocking and the Federal

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block, overhaul ball, or similar component, and the boom tip (or fixed upper block or similar component) must be used. The device(s) must prevent such damage/failure at all points where two-blocking could occur. *Exception*: this device is not required when hoisting personnel in pile driving operations. Instead, paragraph (p)(2) of this section specifies how to prevent two-blocking during such operations.	shall prevent such damage failure at all points where two-blocking could occur. EXCEPTION: This device is not required when hoisting personnel in pile driving operations. Instead Section 5004(k)(14) specifies how to prevent two-blocking during such operations.	exception.
(vi) *Controlled load lowering.* The load line hoist drum must have a system, other than the load line hoist brake, which regulates the lowering rate of speed of the hoist mechanism. This system or device must be used when hoisting personnel. (NOTE: Free fall of the load line hoist is prohibited (see § 1926.1426(d); the use of equipment in which the boom hoist mechanism can free fall is also prohibited (see § 1926.1426(a)(1).)	S. 5004(e) (4) The load line hoist drum shall have a 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). 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.	California proposes to amend Section 5004(e)(4) to address free-fall of the load line and equipment capable of free fall.
(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. (2) The system used to connect the personnel platform to the equipment must allow the platform to remain within 10 degrees of level, regardless of boom angle. (3) The suspension system must be designed to minimize tipping of the platform due to movement of employees occupying the platform. (4) The personnel platform itself (excluding the guardrail system and personal fall arrest system anchorages),	(f) Personnel Platforms -Design Criteria. (1) The personnel platform and suspension system shall be designed by a register engineer. (2) The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform. S 5004 (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	California addresses personnel platform design criteria in Section 5004(f). California addresses platform strength in paragraph (3) as shown.

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must be capable of supporting, without failure, its own weight and at least five times the maximum intended load.	load. 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.	
(5) All welding of the personnel platform and its components must be performed by a certified welder familiar with the weld grades, types and material specified in the platform design. (6) The personnel platform must be equipped with a guardrail system which meets the requirements of subpart M of this part, and must be enclosed at least from the toeboard to mid-rail with either solid construction material or expanded metal having openings no greater than ½ inch (1.27cm). Points to which personal fall arrest systems are attached must meet the anchorage requirements in subpart M of this part. (7) A grab rail must be installed inside the entire perimeter of the personnel platform except for access gates/doors.	(g) Platform Specifications. (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. (2) A grab rail shall be installed inside the entire perimeter of the personnel platform.	California addresses the design specifications of personnel platforms in Section 5004(g).
(8) *Access gates/doors*. If installed, access gates/doors of all types (including swinging, sliding, folding, or other types) must:	(4) Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.	California addresses the design specifications of personnel platforms in Section 5004(g).
.1431 (i) Not swing outward. If due to the size of the personnel platform, such as a 1-person platform, it is infeasible for the door to swing inward and allow safe entry for the platform occupant, then the access gate/door may swing outward. (ii) Be equipped with a device that prevents accidental opening. (9) Headroom must be sufficient to allow employees to stand upright in the platform. (10) In addition to the use of hard hats, employees must be protected by overhead protection on the personnel platform when	(3) Access gates, if installed, shall not swing outward during hoisting (5) Headroom shall be provided which allows employees to stand upright in the platform. Amend Section 5004(g) to read: (6) In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are	California addresses the design specifications of personnel platforms in Section 5004(g). California proposes to amend Section 5004(g) to address platform overhead

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employees are exposed to falling objects. The platform overhead protection must not obscure the view of the operator or platform occupants (such as wire mesh that has up to ½ inch openings), unless full protection is necessary. (11) All edges exposed to employee contact must be smooth enough to prevent injury. (12) The weight of the platform and its rated capacity must be conspicuously posted on the platform with a plate or other permanent marking.	exposed to falling objects. The platform overhead protection shall not obscure the view of the operator or platform occupants (such as mire mesh that has up to ½ inch openings), unless full protection is necessary. (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. (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. (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.	projections per the Federal Standard.
(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) The number of employees occupying the personnel platform shall not exceed the number required for the work being performed	California effectively addresses platform loading.
(2) *Use*. (i) Personnel platforms must be used only for employees, their tools, and the	S. 5004(h) (3) Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to	The use of personnel platform is addressed by Section 5004(h). the

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materials necessary to do their work. Platforms must not be used to hoist materials or tools when not hoisting personnel. (ii) *Exception***:** materials and tools to be used during the lift, if secured and distributed in accordance with paragraph (f)(3) of this section may be in the platform for trial lifts. (3) Materials and tools must be: (i) Secured to prevent displacement. (ii) Evenly distributed within the confines of the platform while it is suspended. (4) The number of employees occupying the personnel platform must not exceed the maximum number the platform was designed to hold or the number required to perform the work, whichever is less.	hoist only materials or tools when not hoisting personnel. (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. (see 5004(h)(2))	number of employees on the platform is addressed by the preceding Section 5004(h)(2).
(g) *Attachment and rigging*. (1) *Hooks and other detachable devices*. (i) Hooks used in the connection between the hoist line and the personnel platform (including hooks on overhaul ball assemblies, lower load blocks, bridle legs, or other attachment assemblies or components) must be: (A) Of a type that can be closed and locked, eliminating the throat opening. (B) Closed and locked when attached. (ii) Shackles used in place of hooks must be of the alloy anchor type, with either: (A) A bolt, nut and retaining pin, in place; or (B) Of the screw type, with the screw pin secured from accidental removal. (iii) Where other detachable devices are used, they must be of the type that can be closed and locked to the same extent as the	Amend Section 5004(i) Rigging to read: (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. (2) Hooks on overhaul ball assemblies, lower load blocks, or other attachments assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening <u>and closed and locked when attached.</u> Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.	California effectively addresses the use of rigging in Section 5004(i). However California proposes to amend Section 5004(i)(2) to address closure and locking of hooks. California addresses the use of hooks, wire rope, bridles, thimbles,shackles

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devices addressed in paragraphs (g)(1)(i) and (ii) of this section. Such devices must be closed and locked when attached. (2) *Rope bridle*. When a rope bridle is used to suspend the personnel platform, each bridle leg must be connected to a master link or shackle (see paragraph (g)(1) of this section) in a manner that ensures that the load is evenly divided among the bridle legs. (3) Rigging hardware (including wire rope, shackles, rings, master links, and other rigging hardware) and hooks must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings must be capable of supporting without failure at least ten times the maximum intended load. (4) Eyes in wire rope slings must be fabricated with thimbles. (5) Bridles and associated rigging for suspending the personnel platform must be used only for the platform and the necessary employees, their tools and materials necessary to do their work. The bridles and associated rigging must not have been used for any purpose other than hoisting personnel.	(2) Hooks on overhaul ball assemblies, lower load blocks, or other attachments assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening and closed and locked when attached. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used. (3) Wire rope, shackles, rings, master links, and other rigging hardware 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) All eyes in wire rope slings shall be fabricated with thimbles. (5) Bridles and associated rigging for attaching the personnel platform to the hoist 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.	and other equipment used in conjunction with personnel platforms in the various shown paragraphs of Section 5004(i).
(h) *Trial lift and inspection*. (1) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight must be made from ground level, or any other location where employees will enter the platform, to each location at which the 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	(j) Trial Lift, Inspection, and Proof Testing. (1) A trial lift with the unoccupied personnel platform loaded at least to the anticipated liftweight shall be made from ground level, or any other location where employees will enter the platform, to each location at which the personnel platform is to be hoisted and positioned. This trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls and safety devices are activated and functioning properly; that no interferences exist; and that all configurations	California effectively addresses the issue of trial lifts, inspection and proof testing in the various paragraphs of Section 5004(j).

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the same as the method that will be used to hoist the personnel.	necessary to reach those work locations will allow the operator to remain under the 50 percent limit of the hoist's rated capacity. Materials and tools to be used during the actual lift can be loaded in the platform, as provided in section 5004(h)(4) and (5) for the trial lift. A single trial lift may be performed at one time for all locations that are to be reached from a single 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 presents no new factors affecting safety. (3) The competent person must determine that: (i) Safety devices and operational aids required by this section are activated and functioning properly. Other safety devices and operational aids must meet the requirements of § 1926.1415 and § 1926.1416. (ii) Nothing interferes with the equipment or the personnel platform in the course of the trial lift. (iii) The lift will not exceed 50 percent of the equipment's rated capacity at any time during the lift. (iv) The load radius to be used during the lift has been accurately determined. (4) Immediately after the trial lift, the competent person must:	S. 5004(j) (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 when the lift route is changed unless the operator determines that the route change is not significant, i.e. the route change would not affect the safety of hoisted employees. (3) After the trial lift, and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to insure that it is secure and properly balanced. Employees shall not be hoisted unless the following conditions are determined to exist: (A) Hoist ropes shall be free of kinks; (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	California effectively addresses the issue of trial lifts, inspection and proof testing in the various paragraphs of Section 5004(j).

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(i) Conduct a visual inspection of the equipment, base support or ground, and personnel platform, to determine whether the trial lift has exposed any defect or problem or produced any adverse effect. (ii) Confirm that, upon the completion of the trial lift process, the test weight has been removed.	ensure all ropes are properly positioned on drums and sheaves. (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. (5) Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.	California effectively addresses the issue of trial lifts, inspection and proof testing in the various paragraphs of Section 5004(j).
(i) [*Reserved.*]		
(j) *Proof testing*. (1) At each jobsite, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging must be proof tested to125 percent of the platform's rated capacity. The proof test may be done concurrently with the trial lift.	S. 5004(j) (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.	California effectively addresses the issue of trial lifts, inspection and proof testing in the various paragraphs of Section 5004(j).
(2) The platform must be lowered by controlled load lowering, braked, and held in a suspended position for a minimum of five minutes with the test load evenly distributed on the platform. (3) After proof testing, a competent person must inspect the platform and rigging to determine if the test has been passed. If any deficiencies are found that pose a safety hazard, the platform and rigging must not be used to hoist personnel unless the deficiencies are corrected, the test is repeated, and a competent person	S. 5004(j) (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	California effectively addresses the issue of trial lifts, inspection and proof testing in the various paragraphs of Section 5004(j).

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determines that the test has been passed. (See § 1926.1417 for tag-out and related requirements.)	another proof test shall be conducted.	
(4) Personnel hoisting must not be conducted until the competent person determines that the platform and rigging have successfully passed the proof test.	Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.	California effectively addresses the issue of trial lifts, inspection and proof testing in the various paragraphs of Section 5004(j).
(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.	S. 5004(d) (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.	California addresses work practices in Section 5004(d).
(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.	Amend Section 5004(k)(1) to read: (k) Work Practices. (1) Employees shall: (A) K~~k~~eep all parts of the body inside the platform during raising, lowering, and 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.	California addresses work practices and platform occupants in Section 5004(k); paragraph one is amended to address positioning of the platform.
(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.	Amend Section 5004 to read: *** (k)(1)(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. (k)(1)(C) Not pull the platform out of plumb in relation to the hoisting equipment.	California proposes to amend Section 5004(k) to address issues addressed by the federal standard for work practices.
(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.	5004(k)(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.	The issue of employees exiting or entering a hoisted platform is addressed by Section 5004(k)(2).
(4) If the platform is tied to the structure, the operator must not move the platform until the operator receives confirmation	Amend Section 5004(k) to read: (10) If the platform is tied to the structure, the operator shall not move	California proposes to amend Section 5004(k) to address issues addressed

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that it is freely suspended.	the platform until the operator receives confirmation that it is freely suspended.	by the federal standard for work practices.
(5) Tag lines must be used when necessary to control the platform.	5004(k)(3) Tag lines shall be used unless their use creates an unsafe condition.	The tag line issue is addressed by Section 5004(k)(3).
(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.	5004(k)(4) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.	Platform control is addressed by California in Section 5004(k) (4).
(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.	5004(k)(11) Platforms with controls. Where the platform is equipped with controls, all of the following shall be met at all times while the platform is occupied: (A) The occupant using the controls in the platform shall be a qualified person with respect to their use, including the safe limitations of the equipment and hazards associated with its operation. (B) The equipment operator shall be at a set of equipment controls that include boom and swing functions of the equipment, and shall be on site and in view of the equipment. (C) The platform operating manual shall be in the platform or on the equipment.	California proposes to amend Section 5004(k) to address issues addressed by the federal standard for work practices.
(8) Environmental conditions. (i) Wind. When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person must determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated). (ii) Other weather and environmental conditions. A qualified person must determine if, in light of indications of dangerous weather conditions, or other impending or existing danger, it is not safe to lift personnel. If it is not, the lifting operation must not begin (or, if already in progress, must be terminated).	5004(k)(5) Hoisting of employees shall be promptly discontinued upon indication of any dangerous weather conditions or other impending danger. (A) When wind speed (sustained or gusts) exceeds 20 mph at the personnel platform, a qualified person shall determine if, in light of the wind conditions, it is not safe to lift personnel. If it is not, the lifting operation shall not begin (or, if already in progress, shall be terminated).	California proposes to amend Section 5004(k) to address environmental conditions per the Federal standard.

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(9) Employees being hoisted must remain in direct communication with the signal person (where used), or the operator.	5004(k)(4) The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied. *** (6) Employees being hoisted and the signal person(s) shall remain in continuous radio communication with the operator.	The issue of communication between hoisted employees and the crane or derrick operator and work over water is addressed in Section 5004(k)(4) & (6).
(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.	5004(k)(7) Except over water, employees occupying the personnel platform shall use a 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.	Fall protection is covered more specifically in Construction Safety Orders Article 24 (Fall Protection)
(11) Other load lines. (i) No lifts must be made on any other of the equipment's load lines while personnel are being hoisted, except in pile driving operations.	(8) No lifts shall be made on another of the crane's or derrick's load lines while personnel are suspended on a platform.	The issue of other load lines and factory produced boom mounted platforms is addressed by the proposed amendments to Section 5004(k).
(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.	Amend Section 5004(k) to read continued: <u>(12) 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.</u>	California proposes to amend Section 5004(k) to address issues addressed by the federal standard for work practices.
(13) *Traveling – derricks*. Derricks are prohibited from traveling while personnel are hoisted.	Section 5004(l) (l) Traveling. (1) Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and cranes on fixed tracks or railways.	California addresses travelling in Section 5004(l).
(l) [*Reserved.*] (m) *Pre-lift meeting*. A pre-lift meeting	S. 5004(m) Pre-lift Meeting.	California addresses prelift meetings

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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.	(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.	in Section 5004(m).
(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).	HVESO S. 2946(b)(3), Table 2 (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. 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	California's High Voltage Electrical Safety Orders contain approach distance tables that effectively address the Federal Standards in paragraph (n).
(o) *Hoisting personnel in drill shafts.* When hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements must be met: (1) The employee must be in either a personnel platform or on a boatswain's	Amend Section 5004(k) to read: (k) Work Practices. ***** (13) Hoisting personnel in drill shafts. When hoisting employees into and out of drill shafts that are up to and including 8 feet in diameter, all of the following requirements shal be met:	California proposes to address the issue of drill shafts by amendment of Section 5004(k).

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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.	(A) The employee shall be in either a personnel platform or on a boatswain's chair. (B) If using a personnel platform, all applicable parts of Section 5004 apply. (C) If using a boatswain's chair: 1. A signal person shall be stationed at the shaft opening. 2. The employee shall be hoisted in a slow, controlled descent and ascent. 3. The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick. 4. The fall protection equipment shall meet the applicable requirements in Article 24 of the Construction Safety Orders. 5. 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. 6. No more than one person shall be hoisted at a time.	California proposes to amend Section 5004(k) to address the boatswain chair issues addressed by the Federal standard.
(p) *Hoisting personnel for pile driving operations*. When hoisting an employee in pile driving operations, the following requirements must be met: (1) The employee must be in a personnel platform or boatswain's chair. (2) For lattice boom cranes: Clearly mark the cable (so that it can easily be seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached. For telescopic boom	(14) Hoisting personnel for pile driving operations. When hoisting an employee in pile driving operations, the following requirements shall be met: (A) The employee shall be in a personnel platform or boatswain's chair. (B) 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	California proposes to amend Section 5004(k) to address pile driving operations and hoisting employees per the Federal standard.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926 SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
cranes: Clearly mark the cable (so that it can be easily seen by the operator) at a point that will give the operator sufficient time to stop the hoist to prevent two-blocking, and use a spotter who is in direct communication with the operator to inform the operator when this point is reached. (3) If using a personnel platform, paragraphs (b) through (n) of this section apply. (4) If using a boatswain's chair: (i) The following paragraphs of this section apply: (a), (c), (d)(1), (d)(3), (d)(4), (e)(1), (e)(2), (e)(3), (f)(1), (f)(2)(i), (f)(3)(i), (g), (h), (j), (k)(1), (k)(6), (k)(8), (k)(9), (k)(11)(i), (m), and (n). Where the terms "personnel platform" or "platform" are used in these paragraphs, substitute them with "boatswains chair." (ii) The employee must be hoisted in a slow, controlled descent and ascent. (iii) The employee must use personal fall protection equipment, including a full body harness, independently attached to the lower 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.	hoist to prevent two-blocking, and use a spotter who is in direct communication with the operator to inform the operator when this point is reached. (C) If using a personnel platform, all applicable parts of Section 5004 apply. (D) If using a boatswain's chair: 1. The employee shall be hoisted in a slow, controlled descent and ascent. 2. The employee shall use personal fall protection equipment, including a full body harness, independently attached to the lower load block or overhaul ball. 3. The fall protection equipment shall meet the applicable requirements in Article 24 of the Construction Safety Orders. 4. 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. 5. No more than one person shall be hoisted at a time.	California proposes to amend Section 5004(k) to address pile driving operations and hoisting employees per the Federal standard.
(q) [*Reserved*.] (r) *Hoisting personnel for marine transfer*. When hoisting employees solely for transfer to or from a marine worksite, the following requirements must be met: (1) The employee must be in either a personnel platform or a marine-hoisted personnel transfer device. (2) If using a personnel platform, paragraphs (a) through (n) of this section	Amend Section 5004(k) to read: (15) Hoisting personnel for marine transfer. When hoisting employees solely for transfer to or from a marine worksite, the following requirements shall be met: (A) The employee shall be in either a personnel platform or a marine-hoisted personnel transfer device. (B) If using a personnel platform, all applicable parts of Section 5004 apply.	California proposes to amend Section 5004(k) to address marine transfer operations and hoisting employees per the Federal standard. California proposes to amend Section 5004(k) to address marine transfer

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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 transfer device must not exceed the maximum number it was designed to hold. (iv) Each employee must wear a U.S. Coast Guard personal flotation device approved for industrial use.	(C) If using a marine-hoisted personnel transfer device: (1) The transfer device shall be used only for transferring workers. (2) The number of workers occupying the transfer device shall not exceed the maximum number it was designed to hold. (3) Each employee shall wear a U.S. Coast Guard personal flotation device approved for industrial use.	operations and hoisting employees per the Federal standard.
(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.	Amend Section 5004(k) to read: (16) 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: (A) 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. (B) If using a personnel platform, all applicable parts of Section 5004 apply. (C) If using a boatswain's chair: (1) The employee shall be hoisted in a slow, controlled descent and ascent.	California proposes to address hoisting of employees for storage tanks, shaft and chimney operations per the Federal standard. California proposes to address hoisting of employees for storage tanks, shaft and chimney operations

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(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 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.	(2) The employee shall use personal fall protection equipment, including a full body harness, attached independent of the crane/derrick. When there is no adequate structure for attachment of personal fall arrest equipment as required in Article 24 of the Construction Safety Orders, the attachment shall be to the lower load block or overhaul ball. (3) The fall protection equipment shall meet the applicable requirements in Article 24 of the Construction Safety Orders. (4) 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. (5) No more than one person shall be hoisted at a time.	per the Federal standard.
§ 1926.1432 Multiple-crane/derrick lifts -- supplemental requirements. (a) *Plan development*. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation must be planned. The planning must meet the following requirements: (1) The plan must be developed by a qualified person. (2) The plan must be designed to ensure that the requirements of this subpart are met. (3) Where the qualified person determines that engineering expertise is needed for the planning, the employer must ensure that it is provided. (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).	Amend Section 4994 [by adding new subsection (f)] to read: (f) Plan development. Before beginning a crane/derrick operation in which more than one crane/derrick will be supporting the load, the operation shall be planned. The planning shall meet the following requirements: (1) The plan shall be developed by a qualified person. (2) The plan shall be designed to ensure that the requirements of Group 13 are met. (3) Where the qualified person determines that engineering expertise is needed for the planning, the employer shall ensure that it is provided. Existing subsection 4994(e): (e) When two or more cranes are used to lift one load, a qualified person, other than the operators, shall direct the operation. This person shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made. A qualified person shall be in direct audible communication with both crane operators at all times to direct the lifting operation. Where two cranes or more are used to lift one load, the rating chart shall be reduced on each crane by not less than 25 percent, unless equalizer or other acceptable provisions assure safe	California addresses multiple crane/derrick lifts in Section 4994; however, California also proposes to amend Section 4994 to address plan development for multiple lifts per the Federal Standard.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	distribution of both vertical and horizontal load to the cranes involved, in which case a lesser reduction may be applied.	
(2) The lift director must review the plan in a meeting with all workers who will be involved with the operation.	(f)(4) The lift director shall review the plan in a meeting with all workers who will be involved with the operation.	
§ 1926.1433 Design, construction and testing. The following requirements apply to equipment that has a manufacturer-rated hoisting/lifting capacity of more than 2,000 pounds.	§4884. Scope. (a) The Orders in this Group shall apply to derricks, cranes, and boom-type excavators, that have a manufacturer-rated hoisting/lifting capacity of more than 2,000 pounds. but they shall not apply to aerial devices designed and used for positioning personnel (See Article 24). (1) The provisions of Group 13 of these Orders as specified apply to dedicated pile drivers, except as specified in this Section. (A) Anti two-blocking device does not apply (B) Load weighing and similar devices applies only to dedicated pile drivers manufactured after November 9, 2011	California address numerous standards having to do with the use of cranes, derricks, and hoisting equipment including the design, construction, installation, maintenance and use through specific national consensus standards as listed in Section 4884. California proposes to expand existing crane and derrick standards and address equipment that is rated at more than 2000 pounds.
(a) Crawler, truck and locomotive cranes manufactured prior to November 8, 2010 must meet the applicable requirements for design, construction, and testing as prescribed in ANSI B30.5–1968 (incorporated by reference, *see* § 1926.6), PCSA Std. No. 2 (1968) (incorporated by reference, *see* § 1926.6), the requirements in paragraph (b) of this section, or the applicable DIN standards that were in effect at the time of manufacture.	S. 4884.1 (b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c)(1)(B): B30.2-1983, Overhead and Gantry Cranes (Top Running Bridge Multiple Girder) B30.4-1981, Portal, Tower and Pillar Cranes B30.5-1982, Crawler, Locomotive and Truck Cranes B30.6-1977, Derricks B30.7-1977, Base Mounted Drum Hoists B30.8-1982, Floating Cranes and Floating Derricks B30.11-1980, Monorails and Underhung Cranes B30.13-1977, Controlled Mechanical Storage Cranes B30.17-1980, Overhead and Gantry Cranes (Top Running Bridge, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)	California address numerous standards having to do with the use of cranes, derricks, and hoisting equipment including the design, construction, installation and use through specific national consensus standards as listed in Section 4884 (note these sections have been relocated verbatim to 4884.1 to separate scope from design standards).

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	(c) Cranes and derricks manufactured after June 23, 1999, through [1 day prior to effective date] 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: B30.2-1996, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist) B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) B30.4-1996, Portal, Tower and Pedestal Cranes B30.5-1994, Mobile and Locomotive Cranes B30.6-1995, Derricks B30.7-1994, Base Mounted Drum Hoists B30.8-1993, Floating Cranes and Floating Derricks B30.11-1993, Monorails and Underhung Cranes B30.13-1996, Storage/Retrieval (S/R) Machines and Associated Equipment B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist) (d) Cranes and derricks manufactured on or after [Effective date] shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards: ASME B30.2–2005, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist) B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) B30.4-1996, Portal, Tower and Pedestal ASME B30.5–2004, Mobile and Locomotive Cranes B30.6-1995, Derricks ASME B30.7–2001, Base-Mounted Drum Hoists B30.8-1982, Floating Cranes and Floating Derricks B30.11-1980, Monorails and Underhung Cranes B30.13-1977, Controlled Mechanical Storage Cranes	

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	B30.14–2004, Side Boom Tractors B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist) *** (f)(1) Except as provided in subsection (f)(2), all cranes and derricks manufactured prior to September 28, 1986, shall conform to this subsection and shall be designed, constructed and installed in accordance with the following applicable ANSI standards: B30.2-1967, Overhead and Gantry Cranes B30.4-1973, Portal, Tower, and Pillar Cranes B30.5-1968, Crawler, Locomotive and Truck Cranes B30.6-1969, Derricks B30.15-1973, Mobile Hydraulic Cranes Exception: Section 15-1.3.2(d) of B30.15-1973, Two-Blocking Damage Prevention Feature. (2) Cranes manufactured prior to January 15, 1974, shall be modified to comply with applicable regulations in Group 13, Cranes and Other Hoisting Equipment of the General Industry Safety Orders, unless it can be shown during the process of certification that a crane cannot feasibly or economically be modified to comply with any one or more applicable requirements and the crane substantially complies with applicable Group 13 regulations and the ANSI or other design standard to which the crane was manufactured.	
(b) Mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the following portions of ASME B30.5–2004 (incorporated by reference, *see* § 1926.6) as applicable: (1) In section 5–1.1.1 (''Load Ratings—Where Stability Governs Lifting Performance''), paragraphs (a)—(d) (including subparagraphs). (2) In section 5–1.1.2 (''Load Ratings—Where Structural Competence Governs Lifting Performance''), paragraph (b). (3) Section 5–1.2 (''Stability (Backward	S. 4884.1 (d) Cranes and derricks manufactured on or after [Effective date] shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards: ASME B30.2–2005, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist) B30.3-1996, Construction Tower Cranes (includes Hammerhead Tower Cranes) B30.4-1996, Portal, Tower and Pedestal ASME B30.5–2004, Mobile and Locomotive Cranes	California address numerous standards having to do with the use of cranes, derricks, and hoisting equipment including the design, construction, installation, maintenance and use through specific national consensus standards as listed in Section 4884 (now relocated to 4884.1 due to formatting). Other standards are included in 4884.1(d) to

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
and Forward)''). (4) In section 5–1.3.1 (''Boom Hoist Mechanism''), paragraphs (a), (b)(1) and (b)(2), except that when using rotation resistant rope, § 1926.1414(c)(4)(ii)(A) applies. (5) In section 5–1.3.2 (''Load Hoist Mechanism''), paragraphs (a)(2) through (a)(4) (including subparagraphs), (b) (including subparagraphs), (c) (first sentence only) and (d). (6) Section 5–1.3.3 (''Telescoping Boom''). (7) Section 5–1.4 (''Swing Mechanism''). (8) In section 5–1.5 (''Crane Travel''), all provisions except 5–1.5.3(d). (9) In section 5–1.6 (''Controls''), all provisions except 5–1.6.1 (c). (10) Section 5–1.7.4 (''Sheaves''). (11) Section 5–1.7.5 (''Sheave sizes''). (12) In section 5–1.9.1 (''Booms''), paragraph (f). (13) Section 5–1.9.3 (''Outriggers''). (14) Section 5–1.9.4 (''Locomotive Crane Equipment''). (15) Section 5–1.9.7 (''Clutch and Brake Protection''). (16) In section 5–1.9.11 (''Miscellaneous equipment''), paragraphs (a), (c), (e), and (f).	B30.6-1995, Derricks ASME B30.7–2001, Base-Mounted Drum Hoists B30.8-1982, Floating Cranes and Floating Derricks B30.11-1980, Monorails and Underhung Cranes B30.13-1977, Controlled Mechanical Storage Cranes B30.14–2004, Side Boom Tractors B30.17-1992, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)	maintain CA effectiveness.
(c) Prototype testing: mobile (including crawler and truck) and locomotive cranes manufactured on or after November 8, 2010 must meet the prototype testing requirements in Test Option A or Test Option B of this section. Tower cranes manufactured on or after November 8, 2010 must meet the prototype testing requirements in BS EN 14439:2006 (incorporated by reference, *see* § 1926.6). **Note:** Prototype testing of crawler, locomotive and truck cranes manufactured prior to November 8, 2010 must conform to paragraph (a) of this section.	4884.2(g) Prototype testing: Cranes manufactured on or after November 8, 2010 shall meet the prototype testing requirements prescribed in 29 CFR 1926.1433 and with Section 5020 and standards incorporated by reference in Section 4884.1 (Design Standards) where more protective.	Since any cranes manufactured in California are likely to be used in interstate commerce, California proposes to reference federal standards for prototype testing.
(1) *Test Option A.* (i) The following applies to equipment		Prototype or operational testing, is

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
with cantilevered booms (such as hydraulic boom cranes): All the tests listed in SAE J1063 (Nov. 1993) Table 1 (incorporated by reference, *see* § 1926.6) must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J1063 (Nov. 1993) Table 2 (incorporated by reference, *see* § 1926.6) must be met. (ii) The following applies to equipment with pendant supported lattice booms: All the tests listed in SAE J987 (Jun. 2003) Table 1 (incorporated by reference, *see* § 1926.6) must be performed to load all critical structural elements to their respective limits. All the strength margins listed in SAE J987 (Jun. 2003) Table 2 (incorporated by reference, *see* § 1926.6) must be met. (2) *Test Option B.* The testing and verification requirements of BS EN 13000:2004 (incorporated by reference, *see* § 1926.6) must be met. In applying BS EN 13000:2004, the following additional requirements must be met: (i) The following applies to equipment with cantilevered booms (such as hydraulic boom cranes): The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J1063 (Nov. 1993) (incorporated by reference, *see* § 1926.6) meet the strength margins listed in SAE J1063 (Nov. 1993) Table 2. (ii) The following applies to equipment with pendant supported lattice booms: The analysis methodology (computer modeling) must demonstrate that all load cases listed in SAE J987 (Jun. 2003) (incorporated by reference, *see* § 1926.6) meet the strength margins listed in SAE J987 (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)		addressed by Section 4884.2(g) (above).

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

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(incorporated by reference, *see* § 1926.6) must be met unless the reliability of the analysis methodology (computer modeling) has been demonstrated by a documented history of verification through strain gauge measuring or strain gauge measuring in combination with other physical testing.		
(d) All equipment covered by this subpart must meet the following requirements: (1) *Rated capacity and related information*. The information available in the cab(see § 1926.1417(c)) regarding "rated capacity" and related information must include, at a minimum, the following information: (i) A complete range of the manufacturer's 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	**Section 4923. Boom Type Mobile Cranes** (a) A durable load chart with clearly legible letters and figures provided by the certified agent shall be securely fixed to the crane in a location clearly visible to the operator or within reach of the operator while at the control station. The chart shall contain a full and complete range of crane load ratings, consistent with the manufacturers' recommendations, at all stated operating radii or boom angles and for all permissible boom lengths, jib lengths and angles, also alternate ratings for use and non-use of optional equipment on the mobile crane, such as outriggers and counterweights which affect ratings. The chart shall also contain essential precautionary or warning notes relative to limitations on equipment and operating procedures, including indication of the least stable position. In addition, no crane shall be rerated unless such rating changes are approved by the certified agent. Load ratings shall be expressed in terms related to method of measuring boom angle and length or lifting radius. S 4965 (Tower Cranes) (c) 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.	The issue of load rating charts for boom type mobile cranes is addressed by Section 4923.

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procedures, including an indication of the least stable direction. (ix) Position of the gantry and requirements for intermediate boom suspension (where applicable). (x) Instructions for boom erection and conditions under which the boom, or boom and jib combinations, may be raised or lowered. (xi) Whether the hoist holding mechanism is automatically or manually controlled, whether free fall is available, or any combination of these. (xii) The maximum telescopic travel length of each boom telescopic section. (xiii) Whether sections are telescoped manually or with power. (xiv) The sequence and procedure for extending and retracting the telescopic boom section. (xv) Maximum loads permitted during the boom extending operation, and any limiting conditions or cautions. (xvi) Hydraulic relief valve settings specified by the manufacturer.	Section 4954 Hydraulic Cranes and Excavators (e) A load rating chart and/or label(s) shall be located on the crane to be available to the operator from the operator's position at the control stand. It shall include the applicable portions of Section 4923 and the maximum loads permitted during actual boom telescoping operation.	The issue of load rating charts for boom type mobile cranes is addressed by Section 4293. In addition , California addresses load rating charts for hydraulic cranes and excavators in Section 4954(e)
(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.	§5060. Hooks. (a) Load hooks (including latched and unlatched types), ball assemblies and load blocks shall be of sufficient weight to overhaul the line from the highest hook position for boom or boom and jib lengths and the number of parts of the line in use.	
(3) Hook and ball assemblies and load blocks must be marked with their rated capacity and weight.	(b) Hook and ball assemblies and load blocks shall be marked with their rated capacity and weight.	
(4) *Latching hooks.* (i) Hooks must be equipped with latches, except where the requirements of paragraph (d)(4)(ii) of this section are met. (ii) Hooks without latches, or with latches removed or disabled, must not be used unless: (A) A qualified person has determined that	(c) Latching hooks. (1) Hooks shall be equipped with latches. EXCEPTION: Hooks without latches, or with latches removed or disabled, shall not be used unless: 1. A qualified person has determined that it is safer to hoist and place the load without latches (or with the latches removed/tied back).	1926.1433(d)(4)(ii)(B) has been modified, consistent with T8 section 5002

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it is safer to hoist and place the load without latches (or with the latches removed/tiedback). (B) Routes for the loads are pre-planned to ensure that noemployee is required to work in the fall zone except for employees necessary for the hooking or unhooking of the load. (iii) The latch must close the throat opening and be designed to retain slings or other lifting devices/accessories in the hook when the rigging apparatus is slack.	2. Routes for the loads are pre-planned to ensure that no employee is required to work in the fall zone. (2) 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	Add new Section 4884.2(h) to read: (h) Posted warnings. Posted warnings required by Group 13 as well as those originally supplied with the equipment by the manufacturer shall be maintained in legible condition.	
(6) An accessible fire extinguisher must be on the equipment.	S.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.	Section 4997 effectively addresses the issue of fire extinguishers.
(7) *Cabs*. Equipment with cabs must meet the following requirements: (i) Cabs must be designed with a form of adjustable ventilation and method for clearing the windshield for maintaining visibility and air circulation. Examples of means for adjustable ventilation include air conditioner or window that can be opened (for ventilation and air circulation); examples of means for maintaining visibility include heater (for preventing windshield icing), defroster, fan, windshield wiper.	S. 4884.1 (b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c)(1)(B): ***** B30.5-1982, Crawler, Locomotive and Truck Cranes S. 4884.1 (c) Cranes and derricks manufactured after June 23, 1999 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	The design and construction of crane cabs are addressed for all cranes derricks in Section 4884.1 through various national consensus standards which are incorporated by reference. The design and construction of crane cabs are addressed for all cranes derricks in Section 4884.1 through various national consensus standards which are incorporated by reference. This includes issues such as visibility and ventilation.

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(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.	S. 4884.1 (b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c)(1)(B): ***** B30.5-1982, Crawler, Locomotive and Truck Cranes (c) Cranes and derricks manufactured after June 23, 1999 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	The issue of cab doors and windows are effectively and comprehensively addressed in similar detail to the federal standard by specific national consensus crane and derrick standards which are incorporated by reference.
(iii) *Windows*. (A) The cab must have windows in front and on both sides of the operator. Forward vertical visibility must be sufficient to give the operator a view of the boom point at all times. (B) Windows may have sections designed to be opened or readily removed. Windows with sections designed to be opened must be designed so that they can be secured to prevent inadvertent closure. (C) Windows must be of safety glass or material with similar optical and safety properties, that introduce no visible distortion or otherwise obscure visibility that interferes with the safe operation of the equipment	S 4997. (b) All windows on such equipment shall be safety glass, or equivalent, without optical distortion and possess optical qualities meeting standards of the California Department of Motor Vehicles. Wire glass, or equivalent, shall only be used for those windows through which the operator is not required to view the operations. Visibility forward shall include a vertical range adequate to cover the boom point at all times. The front window may have a section which may be readily removed or held open if desired. If the section is of the type held in the open position, it shall be secured to prevent closure.	The issue of cab doors and windows are effectively and comprehensively addressed in similar detail to the federal standard by specific national consensus crane and derrick standards which are incorporated by reference.
iv) A clear passageway must be provided from the operator's station to an exit door on the operator's side. (v) Areas of the cab roof that serve as a workstation for rigging, maintenance or other equipment-related tasks must be	S. 4884.1 (b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards	Passage way design and strength characteristics are addressed by the various national consensus crane and derrick standards which are

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capable of supporting 250 pounds without permanent distortion.	Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c)(1)(B): ***** B30.5-1982, Crawler, Locomotive and Truck Cranes (c) Cranes and derricks manufactured after June 23, 1999 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	incorporated by reference in Section 4884.1
(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. (10) Hydraulic and pneumatic lines must be protected from damage to the extent feasible	Amend S. 4925 to read (c) Exhaust gas discharge shall be away from the normal position of the operator. All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties. (d) Hydraulic and pneumatic lines shall be protected from damage to the extent feasible.	The issues of exhaust pipes and air coolers and hydraulic and pneumatic line protection are addressed by existing Section 4925 standards as amended to address hydraulic and pneumatic equipment protection.
(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	S 4925 (c) Exhaust gas discharge shall be away from the normal position of the operator. All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.	Section 4925 effectively addresses the issue of exhaust gas discharge.
(12) *Friction mechanisms*. Where friction mechanisms (such as brakes and clutches) are used to control the boom hoist or load line hoist, they must be: (i) Of a size and thermal capacity sufficient to control all rated loads with the minimum recommended reeving. (ii) Adjustable to permit compensation for lining wear to maintain proper	§4929. Load Hoist Drums. (a) The load hoist drum assemblies shall have power and operational characteristics to perform all load hoisting and lowering functions required in crane service when operated under recommended conditions. (b) Where brakes and clutches are used to control the motion of the load hoist drums, they shall be of such size and thermal capacity to control all rated crane loads with minimum recommended reeving. NOTE: Where maximum rated loads are being lowered with near maximum boom length or operations involving long lowering distances, power controlled lowering usually is necessary to reduce demand on the load brake.	California addresses the issues of friction mechanisms (brakes) to control hoist drum, boom, load line hoist mechanisms in Section 4929, 4930 and adjustments in Section 4932.

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	§4932. Adjustments. Brakes and clutches shall be provided with adjustments where necessary to compensate for wear and to maintain adequate force in springs where used.	
(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.	§4930. Load Hoist Brakes. (a) When power-operated brakes having no continuous mechanical linkage between the actuating and braking means are used for controlling loads, an automatic means shall be provided to prevent the load from falling in the event of loss of brake actuating power.	California addresses the issues of friction mechanisms (brakes) to control hoist drum, boom, load line hoist mechanisms in Section 4929, 4930 and adjustments in Section 4932
(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.	§5031. Inspection. (a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. The 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.	California enforces strict standards on the inspection of crane, derrick and hoisting equipment as shown in Section 5031 rather than merely relying on manufacturer's instruction which may or may not be available.
§ 1926.1434 Equipment modifications. (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.	§5027. ~~Safe Working Load Reduction~~. Equipment Modifications. (a) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited except where the requirements of subsections (a)(1), (a)(2), (a)(3), (a)(4), or (a)(5) of this section are met.	Adopt verbatim.
(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.	(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.	Adopt verbatim.

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(iii) The original safety factor of the equipment is not reduced.	(C) The original safety factor of the equipment is not reduced.	
(2) *Manufacturer refusal to review request*. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/ addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met: (i) A registered professional engineer who is a qualified person with respect to the equipment involved: (A) Approves the modification/addition and specifies the equipment configurations to which that approval applies, and (B) Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition. (ii) The original safety factor of the equipment is not reduced.	(2) Manufacturer refusal to review request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/addition, but it declines to review the technical merits of the proposal or fails, within 30 days, to acknowledge the request or initiate the review, and all of the following are met: (A) A registered professional engineer who is a qualified person with respect to the equipment involved: 1. Approves the modification/addition and specifies the equipment configurations to which that approval applies, and 2. Modifies load charts, procedures, instruction manuals and instruction plates/tags/decals as necessary to accord with the modification/addition. (B) The original safety factor of the equipment is not reduced.	Adopt verbatim.
(3) *Unavailable manufacturer*. The manufacturer is unavailable and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	(3) Unavailable manufacturer. The manufacturer is unavailable and the requirements of subsections (a)(2)(A) and (B) are met.	
(4) *Manufacturer does not complete the review within 120 days of the request*. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/ addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of paragraphs (a)(2)(i) and (ii) of this section are met.	(4) Manufacturer does not complete the review within 120 days of the request. The manufacturer is provided a detailed description of the proposed modification/addition, is asked to approve the modification/ addition, agrees to review the technical merits of the proposal, but fails to complete the review of the proposal within 120 days of the date it was provided the detailed description of the proposed modification/addition, and the requirements of subsections (a)(2)(A) and (B) are met.	
(5) *Multiple manufacturers of equipment*	(5) Multiple manufacturers of equipment designed for use on marine	

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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.	work sites. The equipment is designed for marine work sites, contains major structural components from more than one manufacturer, and the requirements of subsections (a)(2)(A) and (B) are met.	
(b) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing, the employer may treat this as a manufacturer refusal to review the request under paragraph (a)(2) of this section.	(b) Modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of the proposed modification/addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing, the employer may treat this as a manufacturer refusal to review the request under subsection (a)(2).	
(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. (a) This section contains supplemental requirements for tower cranes; all sections of this subpart apply to tower cranes unless specified otherwise.	**§4965. General.** (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.	California standards for tower cranes are contained in Article 96 (including Section 4965-4969).
(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	**§4966. Erection, Dismantling and Operation.** (a) Erection and Dismantling. (1) The erection, climbing (up and down) and dismantling of a fixed tower crane shall comply with the requirements of Title 8, Sections 341.1(b)(2), 4992, 4992.1 and 4992.2 .	California standards for erection and dismantling of cranes and related operations are contained in Section 4966. Sections 4992, 4992.1 and 4992.2 are the state counterparts for 1926.1403, 1404 and 1405 (1926.1406 is not adopted)

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(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."		
(2) *Dangerous areas (self-erecting tower cranes).* In addition to the requirements in § 1926.1404(e), for self-erecting tower cranes, the following applies: Employees must not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.	**§4966. Erection, Dismantling and Operation.** (a) Erection and Dismantling. (1) The erection, climbing (up and down) and dismantling of a fixed tower crane shall comply with the requirements of Title 8, Sections 341.1(b)(2), 4992, 4992.1 and 4992.2 . (2) Dangerous areas (self-erecting tower cranes). In addition to the requirements in §4992.1(e), for self-erecting tower cranes, the following applies: Employees shall not be in or under the tower, jib, or rotating portion of the crane during erecting, climbing and dismantling operations until the crane is secured in a locked position and the competent person in charge indicates it is safe to enter this area, unless the manufacturer's instructions direct otherwise and only the necessary personnel are permitted in this area.	4966 amended with federal verbiage.
(3) *Foundations and structural supports*. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) must be designed by the manufacturer or a registered professional engineer.	S. 4966 (c) Foundations and structural supports. Tower crane foundations and structural supports (including both the portions of the structure used for support and the means of attachment) shall be designed by the manufacturer or a California registered professional engineer. ~~When the certified agent requires the mast to be secured in the shaftway of a structure, the structural members to which it is secured shall be adequate to safely sustain all anticipated loads including vibration.~~ (d) Where the vertical load of the crane assembly is supported by the edges of floor openings of a structure, measures shall be taken to prevent structural damage of such support. (e) When the mast sections are raised to a new position, measures shall be taken to prevent damage or collapse of the crane assembly including	Amend 4966 to incorporate 1926.1435(b)(3)

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	vertical slippage of the mast unit.	
(4) *Addressing specific hazards.* The requirements in § 1926.1404(h)(1) through (9) apply. In addition, the A/D director must address the following: (i) *Foundations and structural supports.* The A/D director must determine that tower crane foundations and structural supports are installed in accordance with their design. (ii) *Loss of backward stability.* Backward stability before swinging self erecting cranes or cranes on traveling or static undercarriages. (iii) *Wind speed.* Wind must not exceed the speed recommended by the manufacturer or, where manufacturer does not specify this information, the speed determined by a qualified person.	Amend Section 4966 to read: (n) Addressing specific hazards. The requirements in §4992.1(h)(1) through (9) apply. In addition, the A/D director shall address the following: (1) Foundations and structural supports. The A/D director shall determine that tower crane foundations and structural supports are installed in accordance with their design. (2) Loss of backward stability. Backward stability before swinging self erecting cranes or cranes on traveling or static undercarriages. (3) 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.	California proposes to amend Section 4966 to address specific hazards.
(5) *Plumb tolerance*. Towers must be erected plumb to the manufacturer's tolerance and verified by a qualified person. Where the manufacturer does not specify plumb tolerance, the crane tower must be plumb to a tolerance of at least 1:500 (approximately 1 inch in 40 feet). (6) *Multiple tower crane jobsites*. On jobsites where more than one fixed jib (hammerhead) tower crane is installed, the cranes must be located such that no crane can come in contact with the structure of another crane. Cranes are permitted to pass over one another. (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.	Amend Section 4966 to read: *** (i) 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). (j) Multiple tower crane jobsites. On jobsites where more than one 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. (k) Climbing procedures. Prior to, and during, all climbing procedures (including inside climbing and top climbing), the employer shall: (1) Comply with all manufacturer prohibitions. (2) Have a California registered professional engineer verify that the host structure is strong enough to sustain the forces imposed through the braces, brace anchorages and supporting floors.	California proposes to amend Section 4966 to address plumb tolerance, multiple tower crane jobsites, climbing procedures and use of a registered engineer top verify the host structure is substantial enough, counterweight ballast, and signs.

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(8) *Counterweight/ballast.* (i) Equipment must not be erected, dismantled or operated without the amount and position of counterweight and/or ballast in place as specified by the manufacturer or a registered professional engineer familiar with the equipment. (ii) The maximum counterweight and/or ballast specified by the manufacturer or registered professional engineer familiar with the equipment must not be exceeded.	Amend Section 4966 to read (continued): (*l*) Counterweight/ballast. (1) 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 California registered professional engineer familiar with the equipment. (2) The maximum counterweight and/or ballast specified by the manufacturer or California registered professional engineer familiar with the equipment shall not be exceeded.	California proposes to amend Section 4966 to address plumb tolerance, multiple tower crane jobsites, climbing procedures and use of a registered engineer top verify the host structure is substantial enough, counterweight ballast, and signs.
(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.	(m) Signs. The size and location of signs installed on tower cranes shall be in accordance with manufacturer specifications. Where these are unavailable, a California registered professional engineer familiar with the type of equipment involved shall approve in writing the size and location of any signs.	California proposes to amend Section 4966 to address plumb tolerance, multiple tower crane jobsites, climbing procedures and use of a registered engineer top verify the host structure is substantial enough, counterweight ballast, and 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:	§5015. Safety devices. (a) Safety devices. The following safety devices are required on all equipment covered by Group 13, unless otherwise specified: [Note: See Section 4968 for tower cranes.] ***** **Amend Section 4968 to read*:*** All tower cranes shall have the following safety devices: (a) Visual warning devices: (1) A warning light which shall be activated at a percentage of the rated load, not to exceed 95 percent of the rated load, or (2) Electronic instrumentation provided by the certified agent that gives a continuous direct reading of the load weight and the trolley radius. (b) An audible signal that operates at a percentage of the rated load, not to exceed 100 percent of the rated load. (c) The visual warning light, and audible signal required by subsections (a)(1) and (b) shall be set to avoid simultaneous activation, and operate with a difference of at least 5 percent of the rated load to ensure independent warnings. (d) An automatic stop that operates at a percentage of the rated load, not to exceed 105 percent of the rated load. (e) When the crane manufacturer specifies lower activation points for safety devices than required by subsections (a)(1), (b) and (d), the manufacturer's specifications shall be followed. (f) Limit devices to: (1) Provide deceleration before the top position of the hook is reached.	California proposes numerous amendments to Section 4968 to address the various types of indicator devices needed to provide operators with information to operate the tower crane safely. California proposes numerous amendments to Section 4968 to address the various types of indicator devices needed to provide operators

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	(2) Limit the trolley traveling both in and out. (g) Constant pressure control devices which automatically return to neutral or the "off" position when released by the operator.	with information to operate the tower crane safely including environmental/meteorological monitoring.
(i) Boom stops on luffing boom type tower cranes. (ii) Jib stops on luffing boom type tower cranes if equipped with a jib attachment. (iii) Travel rail end stops at both ends of travel rail. (iv) Travel rail clamps on all travel bogies. (v) Integrally mounted check valves on all load supporting hydraulic cylinders. (vi) Hydraulic system pressure limiting device. (vii) The following brakes, which must automatically set in the event of pressure loss or power failure, are required: (A)A hoist brake on all hoists. (B) Swing brake. (C) Trolley brake. (D) Rail travel brake. (viii) Deadman control or forced neutral return control (hand) levers. (ix) Emergency stop switch at the operator's station. (x) Trolley end stops must be provided at both ends of travel of the trolley.	(h) Boom stops on luffing boom type tower cranes. (i) Jib stops on luffing boom type tower cranes if equipped with a jib attachment. (j) Travel rail end stops at both ends of travel rail. (k) Travel rail clamps on all travel bogies. (*l*) Integrally mounted check valves on all load supporting hydraulic cylinders. (m) Hydraulic system pressure limiting device. (n) The following brakes, which shall automatically set in the event of pressure loss or power failure, are required: (1)A hoist brake on all hoists. (2) Swing brake. (3) Trolley brake. (o) Rail travel brake. (p) Deadman control or forced neutral return control (hand) levers. (q) Emergency stop switch at the operator's station. (r) Trolley end stops shall be provided at both ends of travel of the trolley. (s) 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.	
(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.	S. 4965(i) (i) Cranes shall be tested, maintained, inspected, and operated as specified by the certified agent and these Orders. Luffing boom tower cranes used in the construction industry shall comply with the requirements of ASME B30.3-1990, Hammerhead Tower Cranes, herein incorporated by reference. *** (k) Proper operation required. Operations shall not begin unless the devices listed in this Article 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	California requires all tower cranes to be operated properly in accordance with the listed national consensus crane standards which include luffing boom tower cranes. In addition, CA proposes to amend Section 4965 to clarify proper operation.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	§5008.1(f). Alternative measures are not permitted to be used.	
(e) *Operational aids.* (1) Section 1926.1416 does not apply to tower cranes.	§5016. Operational aids. (a) The devices listed in this section (''listed operational aids'') are required on all equipment covered by Group 13, unless otherwise specified. [NOTE: See Sections 4968 and 4968.1 for tower cranes.]	CA proposes new section 4968.1 for operational aids for tower cranes.
(2) The devices listed in this section (''operational aids'') are required on all tower cranes covered by this subpart, unless otherwise specified.	S. 4968.1. Operational aids. (a) The devices listed in this section ("operational aids") are required on all tower cranes covered by Group 13, unless otherwise specified.	
(3) Operations must not begin unless the operational aids are in proper working order, except where the employer meets the specified temporary alternative measures. More protective alternative measures specified by the tower crane manufacturer, if any, must be followed. *See* § 1926.1417(j) for additional requirements.	(b) Operations shall not begin unless the operational aids are in proper working order. EXCEPTION: More protective alternative measures specified by the tower crane manufacturer, if any, may be followed. See §5008.1(i) for additional requirements.	Alternative measures, other than those specified by the manufacturer must be approved by the Division.
(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.	(c) If an operational aid stops working properly during operations, the operator shall safely stop operations until the device is again working properly.	Use of a substitute device is not permitted without Division approval.
(5) *Category I operational aids and alternative measures.* Operational aids listed in this 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.	(d) Category I operational aids. 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.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(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.	(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.	
Temporary alternative measures: (A) *Option A.* The trolley rope must be marked (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the trolley prior to the end stops. (B) *Option B.* A spotter who is in direct communication with the operator must be used when operations are conducted within 10 feet of the outer or inner trolley end stops.		All operational aids must be operational prior to and operational at all times. (Required by the manufacturer). Temporary alternatives not permitted.
(ii) *Boom hoist limiting device.* The range of the boom must be limited at the minimum and maximum radius.	(2) Boom hoist limiting device. The range of the boom shall be limited at the minimum and maximum radius.	
Temporary alternative measures: Clearly mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the boom hoist within the minimum and maximum boom radius, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached.		Temporary alternative measures not permitted in CA.
(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.	Temporary alternative measures not permitted in CA.
(iv) *Hoist drum lower limiting device.*	(4) Hoist drum lower limiting device.Tower cranes manufactured after	Temporary alternative measures not

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
Tower cranes manufactured after November 8, 2011 must be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum. *Temporary alternative measures:* Mark the cable (so it can be seen by the operator) at a point that will give the operator sufficient time to stop the hoist prior to last 2 wraps of hoist cable being spooled off the drum, or use a spotter who is in direct communication with the operator to inform the operator when this point is reached	November 8, 2011 shall be equipped with a device that prevents the last 2 wraps of hoist cable from being spooled off the drum.	permitted in CA.
(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.	Temporary alternative measures not permitted in CA.
(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.	Temporary alternative measures not permitted in CA.
(vii) *Rail travel limiting device*. The travel distance in each direction must be limited to prevent the travel bogies from running	(7) Rail travel limiting device. The travel distance in each direction shall be limited to prevent the travel bogies from running into the end stops or	Temporary alternative measures not permitted in CA.

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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	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 not permitted in CA.
(6) *Category II operational aids and alternative measures.* Operational aids listed in this paragraph that are not working properly must be repaired no later than 30 calendar days after the deficiency occurs. *Exception*: If the employer documents that it has ordered the necessary parts within 7 calendar days of the occurrence of the deficiency, and the part is not received in time to complete the repair in 30 calendar days, the repair must be completed within 7 calendar days of receipt of the parts.		No Category II in California (all are Cat I)
(i) *Boom angle or hook radius indicator*. (A) Luffing boom tower cranes must have a boom angle indicator readable from the operator's station. (B) Hammerhead tower cranes manufactured after November 8, 2011 must have a hook radius indicator readable from the operator's station. (C) *Temporary alternative measures:* Hook radii or boom angle must be determined by measuring the hook radii or boom angle with a measuring device.	(9) Boom angle or hook radius indicator. (A) Luffing boom tower cranes shall have a boom angle indicator readable from the operator's station. (B) Hammerhead tower cranes manufactured after November 8, 2011 shall have a hook radius indicator readable from the operator's station.	Temporary alternative measures not permitted in CA.
(ii) *Trolley travel deceleration device*. The	(10) Trolley travel deceleration device. The trolley speed shall be	Temporary alternative measures not

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trolley speed must be automatically reduced prior to the trolley reaching the end limit in both directions. *Temporary alternative measure*: The employer must post anotice 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.	automatically reduced prior to the trolley reaching the end limit in both directions.	permitted in CA.
(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.	Temporary alternative measures not permitted in CA.
(iv) *Load hoist deceleration device*. The load speed must be automatically reduced prior to the hoist reaching the upper limit. *Temporary alternative measure:* The employer must post a notice in the cab of the crane notifying the operator that the load hoist deceleration device is malfunctioning and instructing the operator to take special care to reduce the load speed when approaching the upper limits.	(12) Load hoist deceleration device. The load speed shall be automatically reduced prior to the hoist reaching the upper limit.	Temporary alternative measures not permitted in CA.
(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	(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 not permitted in CA.

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tower crane on the same site, or a qualified person estimates the wind speed.		
(vi) *Load indicating device.* Cranes manufactured after November 8, 2011 must have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement. *Temporary alternative measures:* The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.	(14) Load indicating device. Cranes manufactured after November 8, 2011 shall have a device that displays the magnitude of the load on the hook. Displays that are part of load moment limiting devices that display the load on the hook meet this requirement.	Temporary alternative measures not permitted in CA. (4965d)
(f) *Inspections.* (1) Section 1926.1412 (Inspections) applies to tower cranes, except that the term ''assembly'' is replaced by ''erection.'' Section 1926.1413 (Wire rope—inspection) applies to tower cranes.	(f) Inspections. (1) Article 100 (Inspections and Maintenance) applies to tower cranes, except that the term "assembly" is replaced by "erection." Section 5036 (Wire Rope Inspections) 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	(2) Pre-erection inspection. Before each crane component is erected, it shall be inspected by a qualified person for damage or excessive wear. (A) The qualified person shall pay particular attention to components that will be difficult to inspect thoroughly during shift inspections. (B) If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, that component shall not be erected on the crane unless it is repaired and, upon reinspection by the qualified person, found to no longer create a safety hazard. (C) If the qualified person determines that, though not presently a safety hazard, the component needs to be monitored, the employer shall ensure that the component is checked in the monthly inspections. Any such determination shall be documented, and the documentation shall be available to any individual who conducts a monthly inspection.	

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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.		
(3) *Post-erection inspection.* In addition to the requirements in § 1926.1412(c), the following requirements must be met: (i) A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, must be conducted after each erection. (ii) The load test must be conducted in accordance with the manufacturer's instructions when available. Where these instructions are unavailable, the test must be conducted in accordance with written load test procedures developed by a registered professional engineer familiar with the type of equipment involved.	(3) Post-erection inspection. In addition to the requirements in §5031.6, the following requirements shall be met: (A) A load test using certified weights, or scaled weights using a certified scale with a current certificate of calibration, shall be conducted after each erection. (B) The load test shall be conducted in accordance with the manufacturer's instructions when available. Where these instructions are unavailable, the test shall be conducted in accordance with written load test procedures developed by a certificating agency. §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) In the case of new cranes, before being taken into initial use and every 4 years thereafter. (2) In the case of uncertificated cranes which have been in use, at the time of initial certification and every 4 years thereafter. (3) In the case of major modifications or repairs to important structural components, before they are returned to service. (4) When certificated equipment is out of service for 6 months or more beyond the due date of a certification inspection, an examination equivalent to an initial certification, including proof load test, shall be performed before the equipment re-enters service. 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. (b) Proof load tests of cranes shall be carried out with the boom in the least stable direction relative to the mounting. (c) Proof load tests shall be based on the manufacturer's load ratings for the conditions of use and shall consist of the application of a proof load as close as possible, but not exceeding 110 percent of the load ratings for the boom on the crane. Proof loads shall be applied at the designed maximum and minimum boom angles or radii or as close to these as practicable and at such intermediate radii as the certifying agency may deem necessary. Trolley equipped monorail cranes and overhead cranes shall be tested to a proof load as close as possible, but not exceeding 125 percent of the manufacturer's load rating. Monorail cranes and overhead cranes shall be tested by traversing the proof load weight the full length of the track, bridge/runway(s) and cross-overs, in all directions capable of operation, where practicable. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certified agent as being equivalent to U.S. practice. The weight of all auxiliary handling devices such as, but not limited to, magnets, hooks, slings, and clamshell buckets shall be considered part of the load, except	Note: See CA Section 5022 for proof load tests.

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	lifting devices which are designed as an integral part of the crane. Other methods of proof load testing may be substituted for the above where acceptable to the Division. Note: The manufacturer's load ratings are usually based upon percentage of tipping loads under some conditions and upon limitations of structural competence under others, as well as on other criteria such as type of crane mounting, whether or not outriggers are used, etc. Some cranes utilizing a trolley may have only one load rating assigned and applicable at any outreach. It is important that the manufacturer's ratings be used. (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, and excessive component wear, with particular attention to sheaves, pins, and drums. 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 for malfunction. (3) Deterioration or leakage in lines, tanks, valves, drains, pumps, and other parts of air or hydraulic 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 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) Such other examinations deemed necessary under the circumstances.	
(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	(4) Monthly. The following additional items shall be included: (A) Tower (mast) bolts and other structural bolts (for loose or dislodged condition) from the base of the tower crane up or, if the crane is tied to or braced by the structure, those above the upper-most brace support. (B) The upper-most tie-in, braces, floor supports and floor wedges where	

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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.	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.	(5) Annual. In addition to the items that must be inspected under §5031.2, all turntable and tower bolts shall be inspected for proper condition and torque.	
§ 1926.1436 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.		Title 8, GISO, Article 95. Derricks, applies to derricks.
A derrick is powered equipment consisting of a mast or equivalent member that is held at or near the end by guys or braces, with or without a boom, and its hoisting mechanism. The mast/equivalent member and/or the load is moved by the hoisting mechanism (typically base-mounted) and operating ropes. Derricks include: A-frame, basket, breast, Chicago boom, gin pole (except gin poles used for erection of communication towers), guy, shearleg, stiffleg, and variations of such equipment.	§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. (A) A-Frame Derrick. A derrick in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and joined at the top; the boom point secured to the junction of the side members, and the side members are braced or guyed from this junction point. (B) Breast Derrick. A derrick without a boom. The mast consists of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members. The mast is prevented from tipping forward by guys connected to its top. The load is raised and lowered by ropes through a sheave or block secured to the top crosspiece. (C) Gin Pole Derrick. A derrick without a boom. Its guys are so arranged from its top to permit leaning the mast in any direction. The load is raised and lowered by ropes reeved through sheaves or blocks at the top of the mast. (D) Guy Derrick. A fixed derrick consisting of a mast capable of being rotated, supported in a vertical position by guys, and a boom whose	Derricks are defined in Section 4885.

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	bottom end is hinged or pivoted to move in a vertical plane with a reeved rope between the head of the mast and the boom point for raising and lowering the boom, and a reeved rope from the boom point for raising and lowering the load. (E) Stiffleg Derrick. A derrick similar to a guy derrick except that the mast is supported or held in place by two or more stiff members, called stifflegs, which are capable of resisting either tensile or compressive forces. Sills are generally provided to connect the lower ends of the stifflegs to the foot of the mast. (F) Shearleg Derrick. A derrick without a boom and similar to a breast derrick. The mast, wide at the bottom and narrow at the top, is hinged at the bottom and has its top secured by a multiple reeved guy to permit handling loads at various radii by means of load tackle suspended from the mast top.	
(b) *Operation – procedures.* (1) Section 1926.1417 (Operation) applies except for § 1926.1417(c) (Accessibility of procedures). (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.	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): *** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 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	California enforces comprehensive standards for derricks of all types though incorporation by reference of various national consensus standards which address, use, care, operation, design, construction, testing, safety devices, modifications and maintenance. See rows below for additional rationale.
(b) *Operation – procedures.* (1) Section 1926.1417 (Operation) applies except for § 1926.1417(c) (Accessibility of procedures). (2) *Load chart contents*. Load charts must contain at least the following information: (i) Rated capacity at corresponding ranges of boom angle or operating radii.	§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. The chart shall include but not necessarily be limited to the following data: (1) Certified agent's approved load ratings at corresponding ranges of	California addresses the issue of load charts, rated load markings and use of charts for permanently installed derricks in Section 4961. Again as mentioned earlier the certified agent is involved in the process to ensure the issues addressed in the Federal

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(ii) Specific lengths of components to which the rated capacities apply. (iii) Required parts for hoist reeving. (iv) Size and construction of rope must be included on the load chart or in the operating manual. (3) *Load chart location.* (i) *Permanent installations*. For permanently installed derricks with fixed lengths of boom, guy, and mast, a load chart must be posted where it is visible to personnel responsible for the operation of the equipment.	boom angle or operating radii. (2) Specific length of components on which the load ratings are based. (3) Required parts for hoisting reeving. Size and construction of the rope may be shown either on the rating chart or in the operating manual.	standard are carried out properly.
(ii) *Non-permanent installations*. For derricks that are not permanentlyinstalled, 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 and shall be readily available to personnel responsible for the operation of the equipment.	California also addresses non-permanent installations in Section 4961(b). California proposes to amend 4961(b) to provide equivalency.
(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).	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): ***** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 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	California enforces comprehensive standards for derricks of all types though incorporation by reference of various national consensus standards which address, use, care, operation, design, construction, testing, safety devices, modifications and maintenance.
(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) Derricks shall be guyed and anchored so as to prevent tipping or collapsing. (b) Reinforcing steel shall not be used for guy line anchors.	The erection and construction of guy derricks is addresses in Section 4960 which as can be seen below is proposed for amendment.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(ii) Guy derricks must not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (A) The number of guys. (B) The spacing around the mast. (C) The size, grade, and construction of rope to be used for each guy.	Amend Section 4960 to read: *** (f) Guy derricks shall not be used unless the employer has the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (1) The number of guys. (2) The spacing around the mast. (3) The size, grade, and construction of rope to be used for each guy.	California proposes to amend Section 4960 to address guy derricks per the federal standard.
(iii) For guy derricks manufactured after December 18, 1970, in addition to the information required in paragraph (c)(2)(ii) of this section, the employer must have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (A) The amount of initial sag or tension. (B) The amount of tension in guy line rope at anchor. (iv) The mast base must permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (v) The mast cap must: (A) Permit the mast to rotate freely. (B) Withstand tilting and cramping caused by the guy loads. (C) Be secured to the mast to prevent disengagement during erection. (D) Be provided with means for attaching guy ropes.	(g) For guy derricks manufactured after December 18, 1970, in addition to the information required in subsection (f), the employer shall have the following guy information from the manufacturer or a qualified person, when not available from the manufacturer: (1) The amount of initial sag or tension. (2) The amount of tension in guy line rope at anchor. (h) The mast base shall permit the mast to rotate freely with allowance for slight tilting of the mast caused by guy slack. (i) The mast cap shall: (1) Permit the mast to rotate freely. (2) Withstand tilting and cramping caused by the guy loads. (3) Be secured to the mast to prevent disengagement during erection. (4) Be provided with means for attaching guy ropes.	California proposes to amend Section 4960 to address guy derricks per the federal standard.
(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:	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): ***** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 shall be	The national consensus standards incorporated by reference also contain requirements that address the erection and construction set up of derricks per the Federal Standard which include requirements for mast set up.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(A) Permit the mast to rotate freely (when necessary). (B) Permit deflection of the mast without binding. (iv) The mast must be prevented from lifting out of its socket when the mast is in tension. (v) The stiffleg connecting member at the top of the mast must: (A) Permit the mast to rotate freely (when necessary). (B) Withstand the loads imposed by the action of the stifflegs. (C) Be secured so as to oppose separating forces.	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 S. 4884.2 (a) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.	
(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).	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): ***** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 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 S. 4884.2 (a) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.	The national consensus standards incorporated by reference also contain requirements that address the erection and construction set up of derricks per the Federal Standard, which include requirements for mast set up.
(5) *Chicago boom derricks*. The fittings for stepping the boom and for attaching the topping lift must be arranged to:	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in	The national consensus standards incorporated by reference also

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(i) Permit the derrick to swing at all permitted operating radii and mounting heights between fittings. (ii) Accommodate attachment to the upright member of the host structure. (iii) Withstand the forces applied when configured and operated in accordance with the manufacturer's/ builder's procedures and within its rated capacity. (iv) Prevent the boom or topping lift from lifting out under tensile forces.	accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): *** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 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 S. 4884.2 (a) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.	contain requirements that address the erection and construction set up of derricks per the Federal Standard, which include requirements for mast set up. The national consensus standards incorporated by reference also contain requirements that address the erection and construction set up of derricks per the Federal Standard, which include requirements for mast and boom set up.
(d) *Anchoring and guying.* (1) Load anchoring data developed by the manufacturer or a qualified person must be used. (2) *Guy derricks.* (i) The mast base must be anchored. (ii) The guys must be secured to the ground or other firm anchorage. (iii) The anchorage and guying must be designed to withstand maximum horizontal and vertical forces encountered when operating within rated capacity with the particular guy slope and spacing specified for the application. (3) *Stiffleg derricks.* (i) The mast base and stifflegs must be 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	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): *** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 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 S. 4884.2 (a) Cranes and derricks which do not meet the applicable ANSI standards	The issues of anchoring and guying are addressed by the incorporated by reference standards contained in the various ANSI editions shown in Section 4884.1. California also specifically requires any crane or derrick who for whatever reason does not meet the requirements contained in the ANSI standards to be designed, constructed and installed in accordance with the recommendations of a registered engineer.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
particular stiffleg spacing and slope specified for the application.	shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.	
(e) *Swingers and hoists.* (1) The boom, swinger mechanisms and hoists must be suitable for the derrick work intended and must be anchored to prevent displacement from the imposed loads. (2) *Hoists*. (i) Base mounted drum hoists must meet the requirements in the following sections of ASME B30.7-2001 (incorporated by reference, see § 1926.6): (A) Sections 7-1.1 ("Load ratings and markings"). (B) Section 7-1.2 ("Construction"), except: 7-1.2.13 ("Operator's cab"); 7-1.2.15 ("Fire extinguishers"). (C) Section 7-1.3 ("Installation"). (D) Applicable terms in section 7-0.2 ("Definitions").	4884.1(b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers(ASME) standards or those listed in subsection (c)(1)(B): *** B30.6-1977, Derricks 4884.1(c) Cranes and derricks manufactured after June 23, 1999 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 S. 4884.2 (a) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.	Swingers and hoists are addressed in the national consensus standards shown in section 4884 California also specifically requires any crane or derrick who for whatever reason does not meet the requirements contained in the ANSI standards to be designed, constructed and installed in accordance with the recommendations of a registered engineer.
(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.	**§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) In the case of new cranes, before being taken into initial use and every 4 years thereafter. *** (c) Proof load tests shall be based on the manufacturer's load ratings for the conditions of use and shall consist of the application of a proof load as close as possible, but not exceeding 110 percent of the load ratings for the boom on the crane. Proof loads shall be applied at the designed maximum and minimum boom angles or radii or as close to these as practicable and at such intermediate radii as the certifying agency may	

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	deem necessary. Trolley equipped monorail cranes and overhead cranes shall be tested to a proof load as close as possible, but not exceeding 125 percent of the manufacturer's load rating. Monorail cranes and overhead cranes shall be tested by traversing the proof load weight the full length of the track, bridge/runway(s) and cross-overs, in all directions capable of operation, where practicable. In cases of foreign manufacture, the manufacturer's specifications shall be subject to approval by the certified agent as being equivalent to U.S. practice. The weight of all auxiliary handling devices such as, but not limited to, magnets, hooks, slings, and clamshell buckets shall be considered part of the load, except lifting devices which are designed as an integral part of the crane. Other methods of proof load testing may be substituted for the above where acceptable to the Division.	
(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.	**§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. **S. 4884.** (e) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer	The issue of major modification of a crane for whatever reason that would affect its load capacity is addressed by Section 5022. California also specifically requires any crane or derrick that for whatever reason does not meet the requirements contained in the ANSI standards to be designed, constructed and installed in accordance with the recommendations of a registered engineer.
(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.	**§5034. Adjustments and Repairs.** (a) Adjustments and repairs shall be done by qualified persons. (b) Before adjustments and repairs are started on a crane or derrick, the following precautions shall be taken as applicable: (1) Cranes shall be placed where they will cause the least interference to and be least interfered with by other equipment or operations in the area. (2) Boom and load block shall be lowered to the ground or floor, if possible, or otherwise secured against dropping.	California effectively addresses the issue of repaired or modified equipment in Section 5034.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926 SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	(3) All power controls shall be locked or otherwise secured in the stop position and starting means rendered inoperative. (4) Warnings and barriers shall be placed to warn others from danger area and protect the crane under repair from being struck by other machines or equipment. (c) After all repairs and adjustments have been made, the crane shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed, including all loose material. (d) Adjustments shall be maintained to assure correct functioning of the following components: (1) All functional operating mechanisms. (2) Safety devices. (3) Control systems. (4) Power plants. (5) Brakes. (e) When welding repair procedures are required on load sustaining members, instructions shall be provided by the certified agent and those instructions shall be followed where applicable. Welds on all critical crane or derrick parts shall be performed only by qualified welders who are certified to perform high quality welding. (f) All repair welds performed on critically stressed members, such as boom chord, mast chord, and main deck girders (where permitted by a certified agent), shall be magnetic particle tested or tested by ultrasonic or other suitable nondestructive means as well as visually inspected. All indicated repairs shall be made promptly and records of the most recent test shall be kept until a new test is conducted or until the part is permanently removed from service.	
(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	**§5035. Damaged Booms.** (a) Prior to further use, boom sections or boom suspension components that have been damaged shall be repaired, restoring them to not less than the capacity of the original section or components. (b) Repairs to critically stressed members of a boom or boom extension,	California addresses the issue of repaired or modified hoists in Section 5035 and the preceding Section 5034 discussed on the prior page 92.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
accordance with paragraphs (e)(2)(ii) and (iv) of this section.	such as a boom chord, mast chord, or boom sections, shall be performed in accordance with the manufacturers' or certified agent's recommendations. (c) New or replacement booms or boom extensions shall be tested before use in accordance with Section 5022.	
(iv) *Load test procedure*. Load tests required by paragraphs (e)(2)(ii) or (e)(2)(iii) of this section must be conducted as follows: (A) The test load must be hoisted a vertical distance to assure that the load is supported by the hoist and held by the hoist brake(s). (B) The test load must be lowered, stopped and held with the brake(s). (C) The hoist must not be used unless a competent person determines that the test has been passed.	Amend Section 5023 to read: (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: SWL Proof Load --- Up to 20 tons..... 25 percent in excess 20-50 tons..... 5 tons in excess Over 50 tons..... 10 percent in excess 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. (c) After satisfactory completion of a proof load test, the derrick and all component parts thereof shall be carefully examined in all applicable respects to the requirements of Section 5022(d). (d) 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). (e) The test load shall be lowered, stopped and held with the brake(s). (f) The hoist shall not be used unless a licensed crane certificating agency determines that the test has been passed.	California proposes to amend Section 5023 to address additional test load procedures contained in the federal standard but not addressed in Section 5023.
(f) *Operational aids.* (1) Section 1926.1416 (Operational aids) applies, except for § 1926.1416(d)(1) (Boom hoist limiting device), §	§4884.1. Design Standards. (b) Cranes and derricks manufactured on or after September 28, 1986, through June 23, 1999, shall be designed, constructed and installed in	California encompasses the devices defined as operational aids as safety equipment and devices and the

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
1926.1416(e)(1) (Boom angle or radius indicator), and § 1926.1416(e)(4) (Load weighing and similar devices). (2) *Boom angle aid.* A boom angle indicator is not required but if the derrick is not equipped with a functioning one, the employer must ensure that either: (i) The boom hoist cable must be marked with caution and stop marks. The stop marks must correspond to maximum and minimum allowable boom angles. The caution and stop marks must be in view of the operator, or a spotter who is in direct communication with the operator; or (ii) An electronic or other device that signals the operator in time to prevent the boom from moving past its maximum and minimum angles, or automatically prevents such movement, is used.	accordance with the following applicable American National Standards Institute (ANSI) and/or American Society of Mechanical Engineers (ASME) standards or those listed in subsection (c)(1)(B): *** B30.6-1977, Derricks *** (c) Cranes and derricks manufactured after June 23, 1999 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 (f)(1) Except as provided in subsection (d)(2), all cranes and derricks manufactured prior to September 28, 1986, shall conform to this subsection and shall be designed, constructed and installed in accordance with the following applicable ANSI standards: *** B30.6-1969, Derricks	requirements for the installation and use of such safety equipment/devices for derricks is addressed by the provisions of the incorporated by referenced national consensus standards contained in Section 4884.
(3) *Load weight/capacity devices.* (i) Derricks manufactured more than one year after November 8, 2010 with a maximum rated capacity over 6,000 pounds must have at least one of the following: load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter. *Temporary alternative measures:* The weight of the load must be determined from a source recognized by the industry (such as the load's manufacturer), or by a calculation method recognized by the industry (such as calculating a steel beam from measured dimensions and a known per foot weight), or by other equally reliable means. This information must be provided to the operator prior to the lift.	Amend Section 4960 to read: *** (j) Derricks manufactured more than one year after [Effective Date] with a maximum rated capacity over 6,000 pounds shall have at least one of the following: load weighing device, load moment indicator, rated capacity indicator, or rated capacity limiter.	California proposes to amend Section 4960 to address load weighing device, load moment indicator and rated capacity or rated capacity limiter devices for derricks as shown. Temporary alternative measures not permitted.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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.		Temporary alternative measures not permitted.
(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.	***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, shall be inspected and tested by 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 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. §5024. Examination of Bulk Cargo Handling Devices. All bulk cargo handling devices, together with any portable extension, rigging components, outriggers, and attachment points, supporting them or any of their components vertically, need not be tested but shall be examined by a certificating agency when first certificated and annually thereafter. The examination shall be carried out with particular attention to the condition of rope and accessories. The equipment shall not be considered satisfactory unless, in the opinion of the certificating agency as stated in Section 5021, it is deemed fit to serve its intended function.	California broadly addresses post assembly approval and testing for all derricks regardless of whether they are new or not in Section 5020. Section 5024 pertains to derricks used in Bulk cargo handling and specifies an examination protocol not specifically addressed by the Federal standard.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(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.	***§5025. Certificates.*** If the equipment meets the requirements set forth in Sections 5021, 5022, 5023 and 5024, a certificate shall be issued indicating that the required tests and/or examinations have been performed and that any defects found by such examination and tests have been corrected and that the equipment is in safe operating condition at the time of examination. A copy of such certificate shall be available with each crane and derrick or at the project site. §5024. Examination of Bulk Cargo Handling Devices. All bulk cargo handling devices, together with any portable extension, rigging components, outriggers, and attachment points, supporting them or any of their components vertically, need not be tested but shall be examined by a certificating agency when first certificated and annually thereafter. The examination shall be carried out with particular attention to the condition of rope and accessories. The equipment shall not be considered satisfactory unless, in the opinion of the certificating agency as stated in Section 5021, it is deemed fit to serve its intended function.	In addition to the rationale provided in the preceding page, California address the issuance of certificates demonstrating that the required tests and examinations by certified, qualified individuals have been performed. The examination addresses any defects or malfunctioning parts of the derrick system. In addition, California requires all crane and derricks to be thoroughly inspected prior to first operation on any work shift. The inspection protocol addresses specific pieces of equipment in the crane or derrick system which if not functioning properly can result in failure and employee injury.
(2) *Functional test*. Prior to initial use, new or reinstalled derricks must be tested by a competent person with no hook load to verify proper operation. This test must include: (i) Lifting and lowering the hook(s) through the full range of hook travel. (ii) Raising and lowering the boom through the full range of boom travel. (iii) Swinging in each direction through the full range of swing. (iv) Actuating the anti two-block and boom hoist limit devices (if provided). (v) Actuating locking, limiting and indicating devices (if provided).	**§5031. Inspections - Daily.** (a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. The 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. ~~(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: (1) All functional mechanisms for maladjustment interfering with proper operation; (A) Control mechanisms shall be inspected for maladjustments interfering with proper operation. (B) Control and drive mechanisms shall be inspected for apparent excessive wear of components and contamination by lubricants, water or	In addition to the rationale provided in the preceding page, California

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(2) *Functional test*. Prior to initial use, new or reinstalled derricks must be tested by a competent person with no hook load to verify proper operation. This test must include: (i) Lifting and lowering the hook(s) through the full range of hook travel. (ii) Raising and lowering the boom through the full range of boom travel. (iii) Swinging in each direction through the full range of swing. (iv) Actuating the anti two-block and boom hoist limit devices (if provided). (v) Actuating locking, limiting and indicating devices (if provided).	other foreign matter. (2) The operation of all limit switches without a load on the hook; (3) Lines, tanks, valves, pumps, and other parts of air or hydraulic systems for deterioration or leakage; (4) Hooks and latches for deformation, ~~and~~ cracks, excessive wear, or damage such as from chemicals or heat; (5) Hoist or load attachment chains including end connections for excessive wear, twist, distorted or stretched links interfering with proper function; (6) Excessive wear, broken wires, stretch, kinking, or twisting of ropes and rope slings, including end connections. Wire rope shall be inspected in accordance with §5031(a). (7) Wire rope reeving shall be inspected for compliance with the manufacturer's specifications. (8) Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation. (9) Tires (when in use) for proper inflation and condition. (10) Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. This section does not apply to the inspection of ground conditions for railroad tracks and their underlying support when the railroad tracks are part of the general railroad system of transportation that is regulated pursuant to the Federal Railroad Administration under 49 CFR part 213. (11) The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup. (12) Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view. (13) Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling. This 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.	address the issuance of certificates demonstrating that the required tests and examinations by certified, qualified individuals have been performed. The examination addresses any defects or malfunctioning parts of the derrick system. In addition, California requires all crane and derricks to be thoroughly inspected prior to first operation on any work shift. The inspection protocol addresses specific pieces of equipment in the crane or derrick system which if not functioning properly can result in failure and employee injury. In addition to the rationale provided

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(2) *Functional test*. Prior to initial use, new or reinstalled derricks must be tested by a competent person with no hook load to verify proper operation. This test must include: (i) Lifting and lowering the hook(s) through the full range of hook travel. (ii) Raising and lowering the boom through the full range of boom travel. (iii) Swinging in each direction through the full range of swing. (iv) Actuating the anti two-block and boom hoist limit devices (if provided). (v) Actuating locking, limiting and indicating devices (if provided).	(14) Safety devices and operational aids for proper operation. (b) If any deficiency in subsection (a)(1) through (13) (or in additional inspection items required to be checked for specific types of equipment in accordance with other sections of this standard) is identified, an immediate determination shall be made by the qualified person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment shall be taken out of service until it has been corrected. (c) If any deficiency in subsection (a)(14) (safety devices/operational aids) is identified, the action specified in §5015 and §5016 shall be taken prior to using the equipment.	in the preceding page, California address the issuance of certificates demonstrating that the required tests and examinations by certified, qualified individuals have been performed. The examination addresses any defects or malfunctioning parts of the derrick system. In addition, California requires all crane and derricks to be thoroughly inspected prior to first operation on any work shift. The inspection protocol addresses specific pieces of equipment in the crane or derrick system which if not functioning properly can result in failure and employee injury.
(3) *Load test*. Prior to initial use, new or reinstalled derricks must be load tested by a competent person. The test load must meet the following requirements: (i) Test loads must be at least 100% and no more than 110% of the rated capacity, unless otherwise recommended by the manufacturer or qualified person, but in no event must the test load be less than the maximum anticipated load. (ii) The test must consist of: (A) Hoisting the test load a few inches and holding to verify that the load is supported by the derrick and held by the hoist brake(s). (B) Swinging the derrick, if applicable, the full range of its swing, at the maximum allowable working radius for the test load.	**§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: SWL — Proof Load --- Up to 20 tons..... 25 percent in excess 20-50 tons..... 5 tons in excess Over 50 tons..... 10 percent in excess 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	California addresses proof load testing of derricks in Section 5023. California's proof load tests specy various proof load thresholds to ensure the safety of the test. California requires such testing to be

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(C) Booming the derrick up and down within the allowable working radius for the test load. (D) Lowering, stopping and holding the load with the brake(s). (iii) The derrick must not be used unless the competent person determines that the test has been passed.	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. (c) After satisfactory completion of a proof load test, the derrick and all component parts thereof shall be carefully examined in all applicable respects to the requirements of Section 5022(d).	applied as specified therein. The equipment cannot be used until the required tests have been conducted and passed. Documentation of the tests are required by Section 6025 (see below).
(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.	***§5025. Certificates.*** If the equipment meets the requirements set forth in Sections 5021, 5022, 5023 and 5024, a certificate shall be issued indicating that the required tests and/or examinations have been performed and that any defects found by such examination and tests have been corrected and that the equipment is in safe operating condition at the time of examination. A copy of such certificate shall be available with each crane and derrick or at the project site.	Proof load and all testing required as previously described, must be concluded with the issuance of a certificate to document the event as set forth in Section 5025.
(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.*]	***§5034. Adjustments and Repairs.*** (a) Adjustments and repairs shall be done by qualified persons. (b) Before adjustments and repairs are started on a crane or derrick, the following precautions shall be taken as applicable: (1) Cranes shall be placed where they will cause the least interference to and be least interfered with by other equipment or operations in the area. (2) Boom and load block shall be lowered to the ground or floor, if possible, or otherwise secured against dropping. (3) All power controls shall be locked or otherwise secured in the stop position and starting means rendered inoperative. (4) Warnings and barriers shall be placed to warn others from danger area and protect the crane under repair from being struck by other machines or equipment. (c) After all repairs and adjustments have been made, the crane shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed, including all loose material.	California addresses adjustments and repairs and associated load testing repaired or modified derricks in Section 5034.

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	(d) Adjustments shall be maintained to assure correct functioning of the following components: (1) All functional operating mechanisms. (2) Safety devices. (3) Control systems. (4) Power plants. (5) Brakes. (e) When welding repair procedures are required on load sustaining members, instructions shall be provided by the certified agent and those instructions shall be followed where applicable. Welds on all critical crane or derrick parts shall be performed only by qualified welders who are certified to perform high quality welding. (f) All repair welds performed on critically stressed members, such as boom chord, mast chord, and main deck girders (where permitted by a certified agent), shall be magnetic particle tested or tested by ultrasonic or other suitable nondestructive means as well as visually inspected. All indicated repairs shall be made promptly and records of the most recent test shall be kept until a new test is conducted or until the part is permanently removed from service.	
(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*.]	**§5035. Damaged Booms.** (a) Prior to further use, boom sections or boom suspension components that have been damaged shall be repaired, restoring them to not less than the capacity of the original section or components. (b) Repairs to critically stressed members of a boom or boom extension, such as a boom chord, mast chord, or boom sections, shall be performed in accordance with the manufacturers' or certified agent's recommendations. (c) New or replacement booms or boom extensions shall be tested before use in accordance with Section 5022.	California also addresses damage booms of cranes and derricks and specifies the nature of the repairs to full service that must be made or else the equipment cannot be used.
(j) *Power failure procedures*. If power fails during operations, the derrick operator must safely stop operations. This must include: (1) Setting all brakes or locking devices. (2) Moving all clutch and other power	§5008. Operating Practices. (g) If power fails during operation, the operator shall be required to: (1) Set all brakes and locking devices; (2) Move all clutch or other power controls to the "off" position;	Section 5008 applies to derricks per section 4990.

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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.*]	§4999. Handling Loads. ***** (d) Moving the Load. The individual directing the lift shall see that: ***** (3) Ropes shall not be handled on a winch head without the knowledge of the operator. While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.	Section 4999 applies to derricks per section 4990.
(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. (n) The process of jumping the derrick must be supervised by the A/D director. (o) Derrick operations must be supervised by a competent person.	Amend Section 4960 to read: (a) Derricks shall be guyed and anchored so as to prevent tipping or collapsing. (b) Reinforcing steel shall not be used for guy line anchors. (c) Dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. When taken out of service for 30 days or more, the boom shall be secured by one of the following methods: ~~not in use, the derrick boom shall:~~ (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 ~~B~~be hoisted to a vertical position and secured to the mast. (4) For stiffleg derricks, secured against the stiffleg. (d) The process of jumping the derrick shall be supervised by the A/D director. (e) Derrick operations shall be supervised by a competent person.	California proposes to amend Section 4960 to address booms taken out of service for more than 30 days and include federal language addressing guy derricks hoisted to a vertical position, securing stifle derricks, jumping derricks and supervision 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.	§5031. Inspections – Daily. (a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. The 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	Section 5031 as modified (above) addresses this issue (guys are rigging)

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	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.	
(p) *Inspections*. In addition to the requirements in § 1926.1412, the following additional items must be included in the inspections: ***** (2) *Annual*. (i) Gudgeon pin for cracks, wear, and distortion. (ii) Foundation supports for continued ability to sustain the imposed Loads.	§4960.1 *Inspections*. In addition to the requirements in Article 100, the following additional items shall be included in the inspections: (a) *Annual*. (1) Gudgeon pin for cracks, wear, and distortion. (2) Foundation supports for continued ability to sustain the imposed Loads. (b) Inspections required by subsection (a) shall be performed by a licensed crane certificating agency.	California extensively addresses derrick inspection in Article 100. California also proposes to add new section 4960.1 to cover annual inspection items unique to derricks. Annual inspections are to be performed by a licensed crane certificating agency per section 5021.
(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. (b) Trainees may be authorized to operate cranes or hoisting apparatus provided they are under the supervision of a qualified operator. ~~EXCEPTION: Mobile and tower cranes regulated by Section 5006.1.~~	While California's crane operator certification/qualification standard also excludes derricks, California does require all other types of cranes outside of mobile cranes and tower cranes and hoisting apparatus to be qualified and authorized by the employer to operate such equipment.
§ 1926.1437 Floating cranes/derricks and land cranes/derricks on barges.	**§ 4943. Floating cranes/derricks and land cranes/derricks on barges.**	
(a) This section contains supplemental requirements for floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation (i.e., vessel/flotation device). The sections of this subpart apply to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of	(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). This section applies to floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation, unless specified otherwise. The requirements of this section do not apply when using jacked barges when the jacks are deployed to the river, lake, or sea bed and the barge is	California addresses floating cranes and floating derricks in the various editions of the incorporated by reference consensus standards (Section 4884.1). These standards contain comprehensive requirements for these types of equipment for

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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.	fully supported by the jacks.	floating cranes, derricks and land cranes on barges or pontoons or floating by other means of flotation. In addition, California proposes the following amendments for equivalency with federal standards.
(b) *General requirements*. The requirements in paragraphs (c) through (k) of this section apply to both floating cranes/derricks and land cranes/derricks on barges, pontoons, vessels or other means of flotation.	(b) General requirements. The requirements in subsections (c) through (h) 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.	(c) Work area control. (1) The employer shall either: (A) Erect and maintain control lines, warning lines, railings or similar barriers to mark the boundaries of the hazard areas; or (B) Clearly mark the hazard areas by a combination of warning signs (such as, ''Danger—Swing/Crush Zone'') and high visibility markings on the equipment that identify the hazard areas. In addition, the employer shall train each employee to understand what these markings signify.	
(d) *Keeping clear of the load*. Section 1926.1425 does not apply.		California elects to retain requirements for protection from overhead loads found in Section 5002.
(e) *Additional safety devices*. In addition to the safety devices listed in § 1926.1415, the following safety devices are required: (1) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device must be located in the cab or, when there is no cab, at the operator's station.	(d) Additional safety devices. In addition to the safety devices listed in §5015, the following safety devices are required: (1) Barge, pontoon, vessel or other means of flotation list and trim device. The safety device shall be located in the cab or, when there is no cab, at the operator's station.	
(2) Positive equipment house lock.	(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	(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	

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wind needs to be considered, a wind speed and direction indicator must be used.	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.	S. 5004. (e) Instruments and Components. *** (3)(A) An anti two-block device shall be used which when activated, disengages all crane functions that can cause two-blocking. The device(s) shall prevent such damage/failure at all points where two-blocking could occur. Exception: This device is not required when hoisting personnel in pile driving operations. Instead subsection 5004(k)(14) specifies how to prevent two-blocking during such operations. (B) When a derrick is used to hoist personnel platforms, limiting devices shall be installed to prevent two-blocking.	
(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.	4943(e) Operational Aids. Section 5016(e)(4) (Load weighing and similar devices) does not apply to dragline, clamshell (grapple), magnet, drop ball, container handling, concrete bucket, and pile driving work performed under this section.	
(g) *Accessibility of procedures applicable to equipment operation*. If the crane/derrick has a cab, the requirements of § 1926.1417(c) apply. If the crane/derrick does not have a cab, the employer must ensure that: (1) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with pendant-controlled equipment), the load charts are posted on the equipment. (2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, must be readily available on board the vessel/flotation device.	(f) Accessibility of procedures applicable to equipment operation. If the crane/derrick has a cab, the requirements of §5008.1(b) and (c) apply. If the crane/derrick does not have a cab, the employer shall ensure that: (1) Rated capacities (load charts) are posted at the operator's station. If the operator's station is moveable (such as with pendant-controlled equipment), the load charts are posted on the equipment. (2) Procedures applicable to the operation of the equipment (other than load charts), recommended operating speeds, special hazard warnings, instructions and operators manual, shall be readily available on board the vessel/flotation device.	

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(h) *Inspections*. In addition to meeting the requirements of § 1926.1412 for inspecting the crane/derrick, the employer must inspect the barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derrick, and ensure that: (1) *Shift*. For each shift inspection, the means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension.	(g) Inspections. In addition to meeting the requirements of Article 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.	
(2) *Monthly*. For each monthly inspection: (i) The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension. (ii) The vessel/flotation device is not taking on water. (iii) The deckload is properly secured. (iv) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (v) The firefighting and lifesaving equipment is in place and functional.	(2) Monthly. For each monthly inspection: (A) The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension. (B) The vessel/flotation device is not taking on water. (C) The deckload is properly secured. (D) The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches. (E) The firefighting and lifesaving equipment is in place and functional.	
(3) The shift and monthly inspections are conducted by a competent person, and: (i) If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard. (ii) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.	(3) The shift and monthly inspections are conducted by a qualified person, and: (A) If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard. (B) If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.	
(4) *Annual: external vessel/flotation device inspection.* For each annual inspection: (i) The external portion of the barge, pontoons, vessel or other means of flotation used is inspected annually by a qualified person who has expertise with	(4) Annual: external vessel/flotation device inspection. For each annual inspection: (A) The external portion of the barge, pontoons, vessel or other means of flotation used is inspected annually by a certified agent who has expertise with respect to vessels/flotation devices and that the inspection includes	

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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.6 (iii) If any deficiency is identified, an immediate determination is made by the qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections. (A) If the qualified person determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. *See* requirements in § 1926.1417(f). (B) If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly inspections.	the following items: 1. The items identified in subsections (g)(1) (Shift) and (g)(2) (Monthly). 2. Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items. 3. External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device. 4. Four-corner draft readings. 5. Firefighting equipment for serviceability. (B) Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition. (C) If any deficiency is identified, an immediate determination is made by the certificating agency or qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections. 1. If the certificating agency or 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 §5008.1(f). 2. If the certificating agency or 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,	(5) Four-year: internal vessel/flotation device inspection. For each four-year inspection: (A) A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation.	

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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.	(B) If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate. 1. If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected. 2. If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.	
(6) *Documentation*. The monthly and annual inspections required in paragraphs (h)(2) and (h)(4) of this section are documented in accordance with §§ 1926.1412 (e)(3) and 1926.1412(f)(7), respectively, and that the four-year inspection required in paragraph (h)(5) of this section is documented in accordance with § 1926.1412(f)(7), except that the documentation for that inspection must be retained for a minimum of 4 years. All such documents must be made available, during the applicable document retention period, to all persons who conduct inspections in accordance with § 1926.1412. (i) [*Reserved.*]	(6) Documentation. The monthly and annual inspections required in subsections (g)(2) and (g)(4) are documented in accordance with Sections 5031.1 and 5031.2, respectively, and that the four-year inspection required in subsection (g)(5) is documented in accordance with Section 5031.2, 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 Article 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	Amend Section 6060 to read: *** (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	California proposes to amend T8 Section 6060 which pertains to commercial diving to address the federal issues shown here.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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.	times. (C) In addition to the requirements in Sections 5001-5001.2 (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 section 4943 (j)(5)) shall not allow any amount of shifting in any direction.	
(k) Manufacturer's specifications and limitations. (1) The employer must ensure that the barge, pontoons, vessel, or other means of flotation must be capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations. (2) The employer must ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (3) When the manufacturer's specifications and limitations are unavailable, the employer 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.*]	(h) Manufacturer's specifications and limitations. (1) The employer shall ensure that the barge, pontoons, vessel, or other means of flotation is/are capable of withstanding imposed environmental, operational and in-transit loads when used in accordance with the manufacturer's specifications and limitations. (2) The employer shall ensure that the manufacturer's specifications and limitations with respect to environmental, operational, and in-transit loads for a barge, pontoon, vessel, or other means of flotation are not exceeded or violated. (3) When the manufacturer's specifications and limitations are unavailable, the employer shall ensure that the specifications and limitations established by a qualified person with respect to environmental, operational and in-transit loads for the barge, pontoons, vessel, or other means of flotation are not exceeded or violated.	
(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:	(i) 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:	

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

<table>
<tr><th>FEDERAL: § 1926. 1427-.1442</th><th>STATE: General Industry Safety Orders (GISO)</th><th>RATIONALE</th></tr>
<tr><td>(1) Load charts.
(i) The employer must not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer must comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts.
(ii) The employer must ensure that load charts take into consideration a minimum wind speed of 40 miles per hour.</td><td>(1) Load charts.
(A) The employer shall not exceed the manufacturer load charts applicable to operations on water. When using these charts, the employer shall comply with all parameters and limitations (such as dynamic and environmental parameters) applicable to the use of the charts.
(B) The employer shall ensure that load charts take into consideration a minimum wind speed of 40 miles per hour.</td><td></td></tr>
<tr><td>(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.
TABLE M1
Equipment designed for marine use by permanent attachment (other than derricks):
Rated Capacity Maximum Allowable List
Maximum Allowable Trim
25 tons or less 5 degrees 5 degrees
Over 25 tons 7 degrees 7 degrees
Derricks designed for marine use by permanent attachment:
Any rated capacity 10 degrees 10 degrees</td><td>(2) The employer shall ensure that the requirements for maximum allowable list and maximum allowable trim as specified in Table M1 of this section are met.

TABLE M1
<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.)
TABLE M2
Operated at Wind speed Minimum</td><td>(3) The employer shall ensure that the equipment is stable under the conditions specified in Tables M2 and M3 of this section. (NOTE: Freeboard is the vertical distance between the water line and the main deck of the vessel.)
TABLE M2</td><td></td></tr>
</table>

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

<table>
<tr><th>FEDERAL: § 1926. 1427-.1442</th><th>STATE: General Industry Safety Orders (GISO)</th><th>RATIONALE</th></tr>
<tr><td>freeboard
Rated capacity 60 mph 2 ft
Rated capacity
plus 25%
60 mph 1 ft
High boom,
no load
60 mph 2 ft

TABLE M3
Operated at Wind
speed
For backward stability of the boom:
High boom, no load, full back list
(least stable condition).
90 mph.</td><td>
<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>
<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>
</td><td></td></tr>
<tr><td>(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).</td><td>(4) If the equipment is employer-made, it shall not be used unless the employer has documents demonstrating that the load charts and applicable parameters for use meet the requirements of subsections (i)(1) through (3). 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).</td><td></td></tr>
<tr><td>(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.</td><td>(5) The employer shall ensure that the barge, pontoons, vessel or other means of flotation used:
(A) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick’s maximum rated capacity with all planned and actual deck loads and ballasted compartments.
(B) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free-surface effect.
(C) Have access to void compartments to allow for inspection and pumping.</td><td></td></tr>
</table>

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(n) *Land cranes/derricks*. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation, the employer must ensure that: (1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (i) Account for increased loading from list, trim, wave action, and wind. (ii) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered. (iii) The conditions required in paragraphs (n)(3) and (n)(4) of this section are met.	(j) Land cranes/derricks. For land cranes/derricks used on barges, pontoons, vessels or other means of flotation, the employer shall ensure that: (1) The rated capacity of the equipment (including but not limited to modification of load charts) applicable for use on land is reduced to: (A) Account for increased loading from list, trim, wave action, and wind. (B) Be applicable to a specified location(s) on the specific barge, pontoons, vessel or other means of flotation that will be used, under the environmental conditions expected and encountered. (C) The conditions required in subsection (j)(3) and (j)(4) are met.	
(2) The rated capacity modification required in paragraph (n)(1) of this section is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices.	(2) The rated capacity modification required in subsection (j)(1) is performed by the equipment manufacturer, or a qualified person who has expertise with respect to both land crane/derrick capacity and the stability of vessels/flotation devices.	
(3) For list and trim. (i) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation must not exceed the amount necessary to ensure that the conditions in paragraph (n)(4) of this section are met. In addition, the maximum allowable list and the maximum allowable trim does not exceed the least of the following: 5 degrees, the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person. (ii) The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.	(3) For list and trim. (A) The maximum allowable list and the maximum allowable trim for the barge, pontoon, vessel or other means of flotation shall not exceed the amount necessary to ensure that the conditions in subsection (j)(4) 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. (B) The maximum allowable list and the maximum allowable trim for the land crane/derrick does not exceed the amount specified by the crane/derrick manufacturer, or, when, an amount is not so specified, the amount specified by the qualified person.	

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(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.	(4) For the following conditions: (A) All deck surfaces of the barge, pontoons, vessel or other means of flotation used are above water. (B) 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.	(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 subsection, and that whichever option is used also meets the requirements of subsection (j)(5)(E) of this section.	
(i) *Option (1) – Physical attachment*. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment.	(A) Option (1) – Physical attachment. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment.	
(ii) *Option (2) – Corralling*. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers must ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.	(B) Option (2) – Corralling. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers shall ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.	
(iii) *Option (3) – Rails*. The crane/derrick must be prevented from shifting by being mounted on a rail system. Employers must ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means.	(C) Option (3) – Rails. The crane/derrick shall be prevented from shifting by being mounted on a rail system. Employers shall ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means.	
(iv) *Option (4) – Centerline cable system*. The crane/derrick is prevented from shifting by being mounted to a wire rope system. The employer must ensure that the wire rope system meets the following requirements:	(D) 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: 1. The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick.	

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(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.	2. The wire rope is attached physically to the vessel/flotation device. 3. The wire rope is attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning. 4. Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments. 5. The crane/derrick is secured from movement during operation.	
(v) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design.	(E) The systems/means used to comply with Option (1), Option (2), Option (3), or Option (4) of this section are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design.	
(6) *Exception*. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by paragraph (n)(5) of this section to use Option (1), Option (2), Option (3), or Option (4) does not apply when the employer demonstrates implementation of a plan and procedures that meet the following requirements:	(6) EXCEPTION. For mobile auxiliary cranes used on the deck of a floating crane/derrick, the requirement specified by subsection (j)(5) 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,	(A) A marine engineer or registered professional engineer familiar with floating crane/derrick design develops and signs a written plan for the use of the mobile auxiliary crane. (B) The plan is designed so that the applicable requirements of this section are met despite the position, travel, operation, and lack of physical attachment (or corralling, use of rails or cable system) of the	

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
and lack of physical attachment (or corralling, use of rails or cable system) of the mobile auxiliary crane.	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.	(C) The plan specifies the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters and limitations of such movements and operation.	
(iv) The deck is marked to identify the permitted areas for positioning, travel, and operation. (v) The plan specifies the dynamic and environmental conditions that must be present for use of the plan. (vi) If the dynamic and environmental conditions in paragraph (n)(6)(v) of this section are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of paragraph (n)(5) of this section.	(D) The deck is marked to identify the permitted areas for positioning, travel, and operation. (E) The plan specifies the dynamic and environmental conditions that shall be present for use of the plan. (F) If the dynamic and environmental conditions in subsection (j)(6)(E) are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with Option (1), Option (2) or Option (4) of subsection (j)(5).	
(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.	(7) The barge, pontoons, vessel or other means of flotation used: (A) Are structurally sufficient to withstand the static and dynamic loads of the crane/derrick when operating at the crane/derrick's maximum rated capacity with all anticipated deck loads and ballasted compartments. (B) Have a subdivided hull with one or more longitudinal watertight bulkheads for reducing the free surface effect. (C) Have access to void compartments to allow for inspection and pumping.	
§ 1926.1438 Overhead & gantry cranes.		
(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	**4886. Purpose.** The orders in this Article apply to overhead traveling or bridge cranes, storage cranes, gantry cranes, portal cranes, jib cranes, pillar cranes, pintle cranes, wall cranes, polar cranes of rated capacity exceeding one ton, and any modification of these types which retain their characteristic features except when an order is specific as to type of crane.	California addresses overhead and gantry cranes in addition to several other types in this family of cranes in Section 4886 and Article 92, Cranes (Except Boom-Type Mobile Cranes).

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. (b) *Overhead and gantry cranes that are not permanently installed in a facility*. (1) This paragraph applies to the following equipment when used in construction and not permanently installed in a facility: overhead and gantry cranes, overhead/bridge cranes, semigantry, cantilever gantry, wall cranes, storage bridge cranes, launching gantry cranes, and similar equipment having the same fundamental characteristics, irrespective of whether it travels on tracks, wheels, or other means. (2) The following requirements apply to equipment identified in paragraph (b)(1) of this section: (i) Sections 1926.1400 through 1926.1414; §§ 1926.1417 through 1926.1425; § 1926.1426(d), §§ 1926.1427 through 1926.1434; § 1926.1437, § 1926.1439, and § 1926.1441. (ii) The following portions of § 1910.179: (A) Paragraphs (b)(5),(6),(7); (e)(1),(3),(5),(6); (f)(1),(4); (g); (h)(1),(3); (k); and (n) of § 1910.179. (B) The definitions in § 1910.179(a) except for "hoist" and "load." For those words, the definitions in § 1926.1401 apply. (C) Section 1910.179(b)(2), but only where the equipment identified in paragraph (b)(1) of this section (§ 1926.1438) was manufactured before September 19, 2001. (iii) For equipment manufactured on or after September 19, 2001, the following sections of ASME B30.2-2005 (incorporated by reference, see § 1926.6) apply: 2-1.3.1; 2-1.3.2; 2-1.4.1; 2-1.6; 2-1.7.2; 2-1.8.2; 2-1.9.1; 2-1.9.2; 2-1.11; 2-1.12.2; 2-1.13.7; 2-1.14.2; 2-1.14.3; 2-1.14.5; 2-1.15.; 2-2.2.2; 2-3.2.1.1. In addition, 2-	§4884. 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).~~ power operated equipment, that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: Articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as a fixed jib, i.e., "hammerhead boom"), luffing boom and self-erecting; pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in subsection (c) of this section are excluded from the scope of this standard. See also Sections 4886-4890, 4895-4913]	The Scope Section 4884 establishes the applicability of the California crane orders to employer operations. The GISO addresses the issues addressed in the many regulations only mentioned by the litany of internal references in the federal standard. What applies to various types of cranes and derricks and hoisting equipment under Title 8 standards is described in the state standard on an issue by issue basis rather than by providing a circuitous series of internal references which the State believes makes the employers duty to comply readily discernable. There is no comparable format for this in the State's standards due to the differing organization of the State vs. the Federal standard; but the net effect of placement of the applicable orders in recognizable locations is achieved.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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.	§4944.1. Dedicated Pile Drivers.	
(a) The provisions of subpart CC apply to dedicated pile drivers, except as specified in this section. (b) Section 1926.1416(d)(3) (Anti twoblocking 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.	(a) The provisions of Group 13 apply to dedicated pile drivers, except as specified in this section. (b) Section 5016(d)(3) (Anti twoblocking device) does not apply. (c) Section 5016(e)(4) (Load weighing and similar devices) applies only to dedicated pile drivers manufactured after [Effective Date plus one year].	
(d) In § 1926.1433, only §§ 1926.1433(d) and (e) apply to dedicated pile drivers.		Pile drivers in California are not exempt from other parts of 1926.1433.
§ 1926.1440 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) 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.	Amend section 1694 as follows: §1694. Sideboom Cranes. (a) Sideboom cranes mounted on wheel or crawler tractors shall meet the requirements of SAE J 743 DEC80. (b) The provisions of General Industry Safety Orders, Group 13 (Cranes and Other Hoisting Equipment), apply, except §4991.1 (Ground Conditions), §5015 (Safety Devices), §5016 (Operational Aids), §5006 and §5006.1 (Operator Qualification and Certification). (c) Section 5002.1 (Boom and Load Line Free Fall) applies, except subsection 5002.1(a)(2)(A). Sideboom cranes in which the boom is designed to free fall (live boom) are permitted only if manufactured prior to [Effective date].	Section 1694 amended to incorporate federal standards.
(c) Sideboom cranes mounted on wheel or crawler tractors must meet all of the following requirements of ASME B30.14–2004 (incorporated by reference, *see* § 1926.6): (1) Section 14–1.1 (''Load Ratings''). (2) Section 14–1.3 (''Side Boom Tractor Travel'').	§4884.1. Design Standards. *** (d) Cranes and derricks manufactured on or after [Effective date] shall be designed, constructed and installed in accordance with the following applicable American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) standards:	The design standards, Section 4884 .1 establishes the applicability of the California crane orders to employer operations. The GISO addresses the issues addressed in the many regulations only mentioned by the

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(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).	*** B30.14–2004, Side Boom Tractors ***	litany of internal references in the federal standard. What applies to various types of cranes and derricks and hoisting equipment under Title 8 standards is described in the state standard on an issue-by-issue basis rather than by providing a circuitous series of internal references which the State believes makes the employers duty to comply readily discernable. There is no comparable format for this in the State's standards due to the differing organization of the State vs. the Federal standard; but the net effect of placement of the applicable orders in recognizable locations is achieved.
§ 1926.1441 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. (a) The employer using this equipment must comply with the following provisions of this subpart: § 1926.1400 (Scope); § 1926.1401 (Definitions); § 1926.1402 (Ground conditions); § 1926.1403 (Assembly/disassembly—selection of manufacturer or employer procedures); § 1926.1406 (Assembly/disassembly—	§4884. 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).~~ power operated equipment, 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	The Scope Section 4884 establishes the applicability of the California crane orders to employer operations. The GISO addresses the issues addressed in the many regulations only mentioned by the litany of internal references in the federal standard. What applies to various types of cranes and derricks and hoisting equipment under Title 8 standards is described in the state standard on an issue by issue basis rather than by providing a circuitous series of internal references which the

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
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).	boom and self-erecting; pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in subsection (c) are excluded from the scope of this standard. See Sections 4884 Section 4885 Section 4992 Section 2946(b) Section 5031(d),(e) Section 5008(b) Section 5001 Section 4966(a)(1)(A), 3210(b), 1669 Section 5002, Section 4999(a), 4929, Section 4994(e) Section 5027 Article 96, Article 95 Derricks Article 92 Cranes, (except Boom Type)	State believes makes the employers duty to comply readily discernable. There is no comparable format for this in the State's standards due to the differing organization of the State vs. the Federal standard; but the net effect of placement of the applicable orders in recognizable locations is achieved. Since Section 4884 does not specify a lower limit of applicability; the requirements of group 13 are applied to all equipment. The Title 8 sections cited apply.
	Section 4884. (e) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer. (f) Cranes and derricks shall be operated, tested, inspected and maintained in accordance with these Orders.	In addition, California requires all cranes and derricks which do meet applicable national consensus standards to be used, installed and constructed in accordance with the recommendations of a registered engineer.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(b) *Assembly/disassembly*. (1) In addition to compliance with §§ 1926.1403 (Assembly/disassembly—selection of manufacturer or employer procedures) and 1926.1406 (Assembly/disassembly—employer procedures), the employer must also comply with § 1926.1441(b)(2)-(3). (2) *Components and configuration*. The employer must ensure that: (i) The selection of components, and the configuration of the equipment, that affect the capacity or safe operation of the equipment complies with either the: (A) Manufacturer instructions, recommendations, limitations, and specifications. When these documents and information are unavailable, a registered professional engineer familiar with the type of equipment involved must approve, in writing, the selection and configuration of components; or	***§4992. Booms.*** Booms which are being assembled or disassembled on the ground shall be securely blocked or secured to prevent dropping of the boom and boom sections. S. 4884 (e) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer. (f) Cranes and derricks shall be operated, tested, inspected and maintained in accordance with these Orders. §5034. Adjustments and Repairs. (a) Adjustments and repairs shall be done by qualified persons §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, shall be inspected and tested by 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 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.	California addressed the assembly and disassembly of booms in Section 4992. These standards apply to all equipment equipped with a boom used in lifting service.
(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	**§5031. Inspection.** (a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. The 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	Section 5031 addresses inspection of all crane or derricks to ensure safe operation.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(b)(2)(i) of this section (see § 1926.1412(c) for post-assembly inspection requirements). (3) *Manufacturer prohibitions*. The employer must comply with applicable manufacturer prohibitions.	shall be corrected promptly. Defective components of equipment which create an imminent safety hazard shall be replaced, repaired or adjusted prior to use. S. 4884. (e) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer. (f) Cranes and derricks shall be operated, tested, inspected and maintained in accordance with these Orders.	Furthermore, California requires all cranes and derricks which do not fall into any of the categories addressed by the incorporated by reference to be operated in accordance with the recommendations of a registered engineer.
(c) *Operation – procedures*. (1) The employer must comply with all manufacturer procedures applicable to the operational functions of the equipment, including its use with attachments. (2) *Unavailable operation procedures*. The employer must: (i) When the manufacturer's procedures are unavailable, develop, and ensure compliance with, all procedures necessary for the safe operation of the equipment and attachments. (ii) Ensure that procedures for the operational controls are developed by a qualified person. (iii) Ensure that procedures related to the capacity of the equipment are developed and signed by a registered professional engineer familiar with the equipment. (3) *Accessibility*. The employer must ensure that	**§3328. Machinery and Equipment.** (b) Machinery and equipment in service shall be inspected and maintained as recommended by the manufacturer where such recommendations are available. **§5033. Maintenance.** A preventive maintenance program, based on the certified agent's recommendations, shall be established and dated. Detailed records shall be available to the Division.	California requires all machinery and equipment to be inspected and maintained per the manufacturer's recommendations. California requires the certified agent to establish a preventive maintenance program that will ensure continued safe operation and requires that detailed records of the program and recommendations be available to the Division of Occupational Safety and Health.
(i) The load chart is available to the operator at the control station;	**§4923. Load Rating Chart.** (a) A durable load chart with clearly legible letters and figures provided by the certified agent shall be securely fixed to the crane in a location clearly visible to the operator or within reach of the operator while at the control station. The chart shall contain a full and complete range of crane load ratings, consistent with the manufacturers' recommendations, at all stated operating radii or boom angles and for all permissible boom lengths, jib lengths and angles, also alternate ratings for use and non-use of optional equipment on the mobile crane, such as outriggers and counterweights which	California addresses load rating chart requirements in Section 4923.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	affect ratings. The chart shall also contain essential precautionary or warning notes relative to limitations on equipment and operating procedures, including indication of the least stable position. In addition, no crane shall be rerated unless such rating changes are approved by the certified agent. Load ratings shall be expressed in terms related to method of measuring boom angle and length or lifting radius.	
(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.	**§5033. Maintenance.** A preventive maintenance program, based on the certified agent's recommendations, shall be established and dated. Detailed records shall be available to the Division. **§3328. Machinery and Equipment.** (a) Machinery and equipment shall be of adequate design and shall not be used or operated under conditions of speeds, stresses, or loads which endanger employees. (h) Only qualified persons shall be permitted to maintain or repair machinery and equipment.	California requires all machinery and equipment to be inspected and maintained per the manufacturer's recommendations. California requires the certified agent to establish a preventive maintenance program that will ensure continued safe operation and requires that detailed records of the program and recommendations be available to the Division of Occupational Safety and Health.
(d) *Safety devices and operational aids.* (1) The employer must ensure that safety devices and operational aids that are part of the original equipment are maintained in accordance with manufacturer procedures. (2) *Anti two-blocking.* The employer must ensure that equipment covered by this section manufactured more than one year after November 8, 2010 have either an anti two-block device that meets the requirements of § 1926.1416(d)(3), or is designed so that, in the event of a two-block situation, no damage or load failure will occur (for example, by using a power unit that	**§3328. Machinery and Equipment.** (b) Machinery and equipment in service shall be inspected and maintained as recommended by the manufacturer where such recommendations are available. S.4924 (d) Anti two-block prevention and warning features. (1) Telescopic boom cranes manufactured after February 28, 1992, shall be equipped with an anti two-block device or two-block damage prevention feature for all points of two-blocking. (2) Lattice boom cranes manufactured after February 28, 1992, shall be equipped with an anti two-block device or a two-block warning feature, which functions for all points of two-blocking. EXCEPTION: The requirements of subsection (d)(2), do not apply to lattice boom cranes when used for dragline, clamshell (grapple), magnet, and drop ball work. The requirements of subsection (d)(2), do not apply	California requires all machinery and equipment to be inspected and maintained per the manufacturer's recommendations. California requires the certified agent to establish a preventive maintenance program that will ensure continued safe operation and requires that detailed records of the program and recommendations be available to the Division of Occupational Safety and Health. California currently addresses the

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
stalls in response to a two-block situation).	to lattice boom cranes when used for dragline, clamshell (grapple), magnet, and drop ball work. (3) Articulating boom cranes manufactured after August 30, 2001, equipped with a load hoisting device (winch) shall be equipped with a two-block damage prevention feature.	need for anti two- blocking equipment in Section 4924, which has been relocated to 5016(d)(3).
(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.	**§5006. 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. (b) Trainees may be authorized to operate cranes or hoisting apparatus provided they are under the supervision of a qualified operator. Exception: Mobile and tower cranes regulated by Section 5006.1	In addition to existing Title 8, injury and illness prevention training contained in Section 3203, section 5006 specifically requires that only trained and authorized persons are allowed to operate hoisting equipment.
(f) *Signal person qualifications*. The employer must train each signal person in the proper use of signals applicable to the use of the equipment.	**§5001. Signals.** (a) A signal person shall be provided when the point of operation is not in full and direct view of the operator unless a signaling or control device is provided for safe direction of the operator. (b) Only qualified persons shall be permitted to give signals.	California requires that qualified persons gives signals; qualified person are those who by experience and/or training are competent to perform their assigned duties in a safe manner. California also requires that a trained (qualified) signal person be provided during lifting operations.
(g) [*Reserved*.] (h) *Inspections*. The employer must ensure that equipment is inspected in accordance with manufacturer procedures. *(i) Reserved*.]	**§5031. Inspection.** (a) A qualified person shall visually inspect the crane's or derrick's controls, rigging and operating mechanism prior to the first operation on any work shift. The 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.	California addresses equipment inspection in Section 5031; the inspection is comprehensive in that it addresses all operating functions of the equipment used in lifting service. It applies to all cranes regardless of capacity.
(j) *Hoisting personnel*. The employer must ensure that equipment covered by this section is not used to hoist personnel.	**§3328. Machinery and Equipment.**	California's Section 3328 prohibits any type or piece of machinery to

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
	(a) Machinery and equipment shall be of adequate design and shall not be used or operated under conditions of speeds, stresses, or loads which endanger employees.	designed to perform its intended purpose safely and shall not be operated in an unsafe manner as described therein.
(k) *Design*. The employer must ensure that the equipment is designed by a qualified engineer.	S. 4884 (e) Cranes and derricks which do not meet the applicable ANSI standards shall be designed, constructed and installed in accordance with the recommendations of a currently registered mechanical or civil engineer.	California requires that all cranes and derricks that do not meet applicable consensus standards as set forth by those listed in Section 4884, that they be designed, constructed and installed in accordance with the recommendations of a registered engineer.
§ 1926.1442 Severability. (a) Should a court of competent jurisdiction hold any provision(s) of subpart CC to be invalid, such action shall not affect any other provision of the subpart.	N/A	This is non regulatory language not enforceable under the operational procedures and policies of the Division of Occupational Safety and Health and therefore inconsequential.

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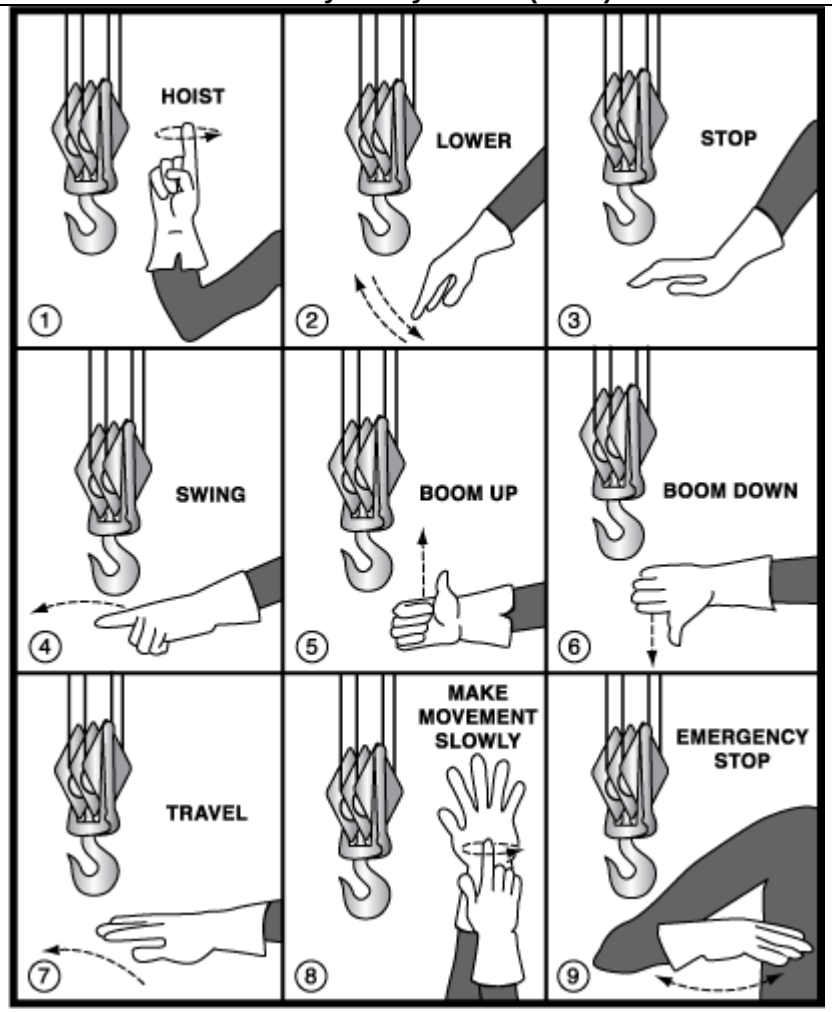
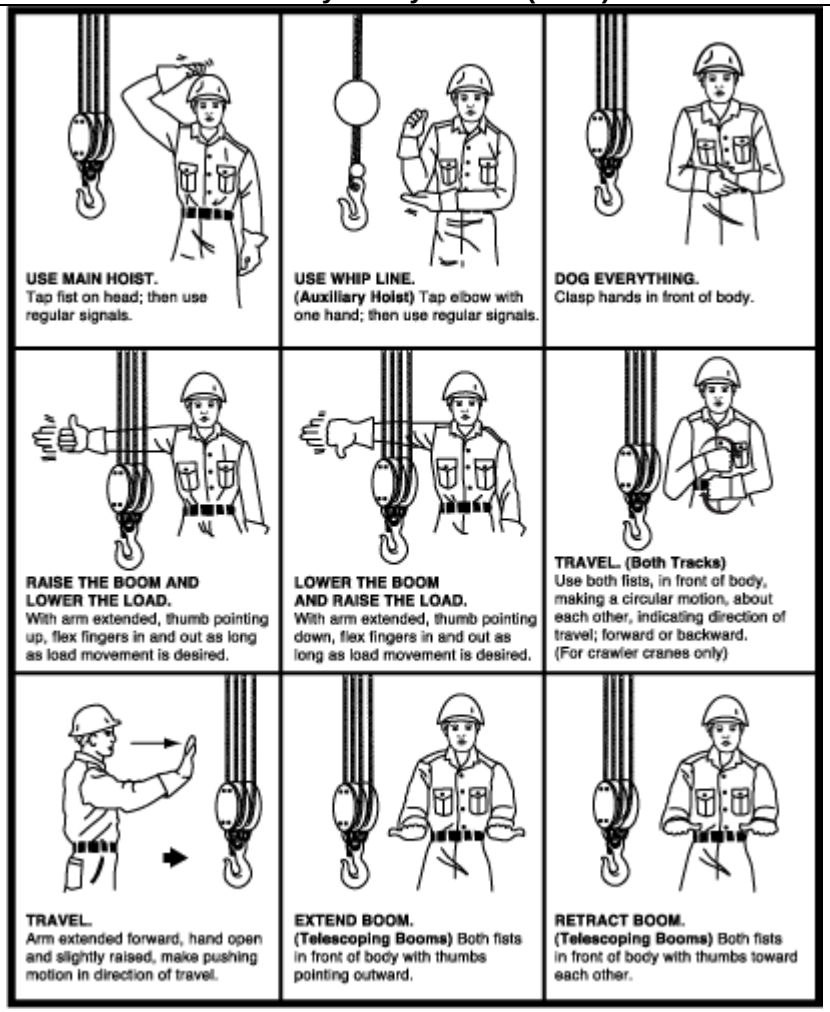
SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
Appendix A to Subpart CC of Part 1926–Standard Hand Signals. **STOP –** With arm extended horizontally to the side, palm down, arm is swung back and forth. **EMERGENCY STOP** – With both arms extended horizontally to the side, palms down, arms are swung back and forth. **HOIST –** With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles. **RAISE BOOM –** With arm extended horizontally to the side, thumb points up with other fingers closed. **SWING –** With arm extended horizontally, index finger points in direction that boom is to swing. **RETRACT TELESCOPING BOOM –** With hands to the front at waist level, thumbs point at each other with other fingers closed. **RAISE THE BOOM AND LOWER THE LOAD –** With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired. **DOG EVERYTHING –** Hands held together at waist level. **LOWER –** With arm and index finger pointing down, hand and finger make small circles. **LOWER BOOM –** With arm extended horizontally to the side, thumb points down with other fingers closed.		California addresses hand signals in the GISO section as Plate No. 1 to section 5001, entitled: PLATE I - RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS These illustrations address hand signals for Crane Operations and all boom equipment operations.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
Appendix A (continued) **EXTEND TELESCOPING BOOM –** With hands to the front at waist level, thumbs point outward with other fingers closed. **TRAVEL/TOWER TRAVEL** – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel. **LOWER THE BOOM AND RAISE THE LOAD –** With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired. **MOVE SLOWLY –** A hand is placed in front of the hand that is giving the action signal. **USE AUXILIARY HOIST** (whipline) **–** With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action. **CRAWLER CRANE TRAVEL, BOTH TRACKS –** Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward. **USE MAIN HOIST –** A hand taps on top of the head. Then regular signal is given to indicate desired action.	 **USE MAIN HOIST.** Tap fist on head; then use regular signals. **USE WHIP LINE. (Auxiliary Hoist)** Tap elbow with one hand; then use regular signals. **DOG EVERYTHING.** Clasp hands in front of body. **RAISE THE BOOM AND LOWER THE LOAD.** With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired. **LOWER THE BOOM AND RAISE THE LOAD.** With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired. **TRAVEL. (Both Tracks)** Use both fists, in front of body, making a circular motion, about each other, indicating direction of travel; forward or backward. (For crawler cranes only) **TRAVEL.** Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel. **EXTEND BOOM. (Telescoping Booms)** Both fists in front of body with thumbs pointing outward. **RETRACT BOOM. (Telescoping Booms)** Both fists in front of body with thumbs toward each other.	California addresses hand signals in the GISO section as Plate No. 1 to section 5001, entitled: PLATE I - RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS These illustrations address hand signals for Crane Operations and all boom equipment operations.

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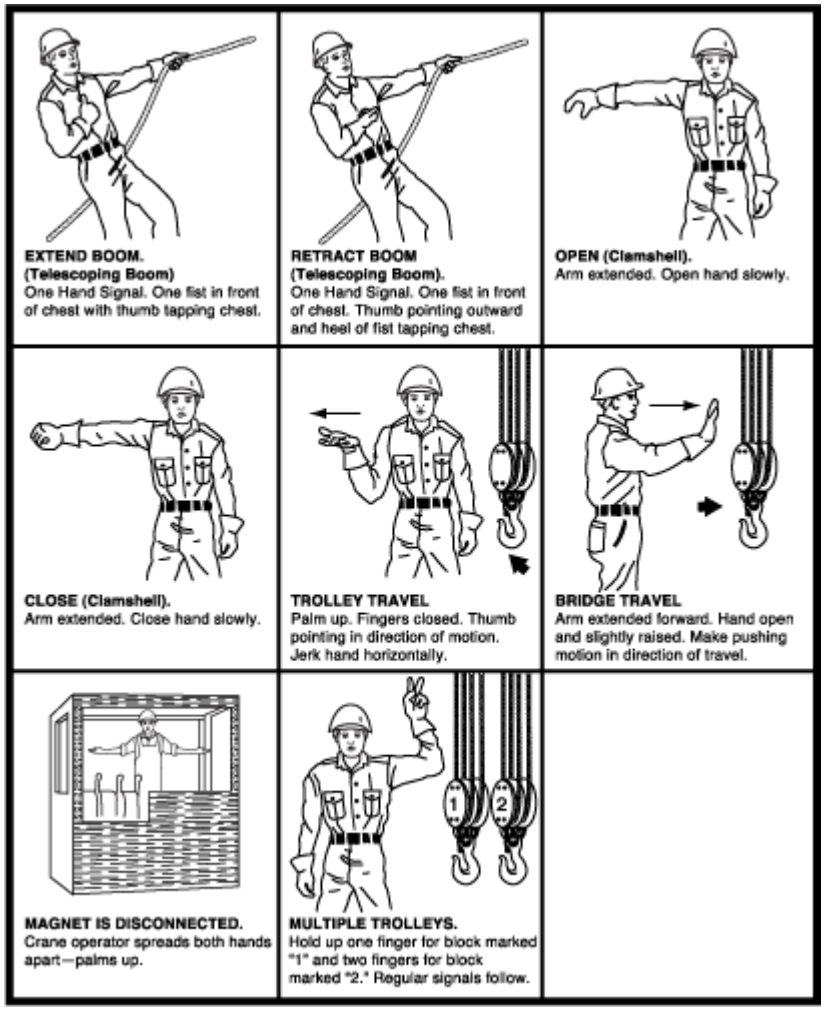
FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
Appendix A (continued) **CRAWLER CRANE TRAVEL, ONE TRACK –** Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel. **TROLLEY TRAVEL** – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.	 **EXTEND BOOM. (Telescoping Boom)** One Hand Signal. One fist in front of chest with thumb tapping chest. **RETRACT BOOM (Telescoping Boom).** One Hand Signal. One fist in front of chest. Thumb pointing outward and heel of fist tapping chest. **OPEN (Clamshell).** Arm extended. Open hand slowly. **CLOSE (Clamshell).** Arm extended. Close hand slowly. **TROLLEY TRAVEL** Palm up. Fingers closed. Thumb pointing in direction of motion. Jerk hand horizontally. **BRIDGE TRAVEL** Arm extended forward. Hand open and slightly raised. Make pushing motion in direction of travel. **MAGNET IS DISCONNECTED.** Crane operator spreads both hands apart—palms up. **MULTIPLE TROLLEYS.** Hold up one finger for block marked "1" and two fingers for block marked "2." Regular signals follow.	California addresses hand signals in the GISO section as Plate No. 1 to section 5001, entitled: PLATE I - RECOMMENDED HAND SIGNALS FOR CONTROLLING CRANE OPERATIONS These illustrations address hand signals for Crane Operations and all boom equipment operations.

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SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
Appendix B to Subpart CC of Part 1926–Assembly/Disassembly: Sample Procedures for Minimizing the Risk of Unintended Dangerous Boom Movement. 1. Section 1926.1404(f)(1) provides that when pins (or similar devices) are being removed, employees must not be under the boom, jib, or other components, except where the requirements of § 1926.1404(f)(2) are met. The exception in § 1926.1404(f)(2) applies when the employer demonstrates that site constraints require one or more employees to be under the boom, jib, or other components when pins (or similar devices) are being removed. In such a situation, the A/D director must implement procedures that minimize the risk of unintended dangerous movement and minimize the duration and extent of exposure under the boom. The following scenario is an example of how the exception applies: A boom cannot be disassembled on the ground because of aboveground piping (as might be found, for example, in an oil refinery) that precludes lowering the boom to the ground. The boom must therefore be disassembled in the air, and the employees who remove the pins must perform that work from an aerial lift whose base is positioned on one side (the near side) of the boom. To gain access to the pins on the far side, the aerial lift basket must move under the boom, since, due to lack of room, the aerial lift cannot be repositioned on the far side. Due to lack of room, the aerial lift cannot be repositioned on the far side, so the aerial basket must move under the boom to gain access to the pins on the far side.		The Federal Appendix B is information only and is therefore unenforceable language.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
To minimize the risk of unintended dangerous movement while the pins are removed, the A/D director uses an assist crane that is rigged to support the boom section that is being detached, using particular care to ensure that the section end that is near the employee(s) removing the pins is well supported. The duration and extent of exposure is minimized by removing the far side pins first, moving the aerial lift basket as soon as possible to the near side so that the employees are no longer under the boom, and then removing the near side pins. 2. Section 1926.1404(h)(6)(i) provides that, during assembly/disassembly, the center of gravity of the load must be identified if that is necessary for the method used for maintaining stability. Section 1926.1404(h)(6)(ii) states that, where there is insufficient information to accurately identify the center of gravity, measures designed to prevent unintended dangerous movement resulting from an inaccurate identification of the center of gravity must be used. An example of the application of § 1926.1404(h)(6)(ii) is as follows: The boom is assembled by lowering boom sections sequentially into place using an assist crane. The A/D director's plan is to keep the boom sections stable while they are lowered into place by attaching the assist crane hoist line above the center of gravity of each section. However, in assembling the non-symmetrical top section of the boom, the A/D director is not able to determine where to attach the assist crane hoist line so that it is above the center of gravity. In this situation, before raising the section, all personnel are kept clear of the section and the section is first raised a few inches to determine whether it tips when raised (if it did tip, it would indicate it is not rigged		The Federal Appendix B is information only and is therefore unenforceable language.

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FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
over the center of gravity). If this occurs, the hoist line is repositioned and the procedure repeated (with employees kept clear of the section while it is raised) until the A/D director determines that it is rigged over the center of gravity and can be moved into place without dangerous movement		The Federal Appendix B is information only and is therefore unenforceable language.
Appendix C to Subpart CC of Part 1926–Operator Certification: Written Examination: Technical Knowledge Criteria. This appendix contains information for employers, accredited testing organizations, auditors and government entities developing criteria for a written examination to test an individual's technical knowledge relating to the operation of cranes. (a) General technical information. (1) The functions and limitations of the crane and attachments. (2) Wire rope: (i) Background information necessary to understand the inspection and removal from service criteria in § 1926.1413 and § 1926.1414. (ii) Capacity and when multi-part rope is needed. (iii) Relationship between line pull and safe working load. (iv) How to determine the manufacturer's recommended rope for the crane. (3) Rigging devices and their use, such as: (i) Slings. (ii) Spreaders. (iii) Lifting beams. (iv) Wire rope fittings, such as clips, shackles and wedge sockets. (v) Saddles (softeners). (vi) Clamps (beams). (4) The technical limitations of protective measures against electrical hazards:		The Federal Appendix C is information only and is therefore unenforceable language.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(i) Grounding. (ii) Proximity warning devices. (iii) Insulated links. (iv) Boom cages. (v) Proximity to electric power lines, radii, and microwave structures. (5) The effects of load share and load transfer in multi-crane lifts. (6) Basic crane terms. (7) The basics of machine power flow systems. (i) Mechanical. (ii) Electrical. (iii) Pneumatic. (iv) Hydraulic. (v) Combination. (8) The significance of the instruments and gauge readings. (9) The effects of thermal expansion and contraction in hydraulic cylinders. (10) Background information necessary to understand the requirements of preoperation and inspection. (11) How to use the safety devices and operational aids required under § 1926.1415 and § 1926.1416. (12) The difference between duty-cycle and lifting operations. (13) How to calculate net capacity for every possible configuration of the equipment using the manufacturer's load chart. (14) How to use manufacturer-approved attachments and their effect on the equipment. (15) How to obtain dimensions, weight, and center of gravity of the load. (16) The effects of dynamic loading from: (i) Wind. (ii) Stopping and starting. (iii) Impact loading. (iv) Moving with the load. (17) The effect of side loading. (18) The principles of backward stability. (b) Site information.		The Federal Appendix C is information only and is therefore unenforceable language.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(1) How to identify the suitability of the supporting ground/surface to support the expected loads of the operation. Elements include: (i) Weaknesses below the surface (such as voids, tanks, loose fill). (ii) Weaknesses on the surface (such as retaining walls, slopes, excavations, depressions). (2) Proper use of mats, blocking/cribbing, outriggers, stabilizers, or crawlers. (3) Identification of site hazards such as power lines, piping, and traffic. (4) How to review operation plans with supervisors and other workers (such as the signal person), including how to determine working height, boom length, load radius, and travel clearance. (5) How to determine if there is adequate room for extension of crawlers or outriggers/stabilizers and counterweights. (c) Operations. (1) How to pick, carry, swing and place the load smoothly and safely on rubber tires and on outriggers/stabilizers or crawlers (where applicable). (2) How to communicate at the site with supervisors, the crew and the signal person. (3) Proper procedures and methods of reeving wire ropes and methods of reeving multiple-part lines and selecting the proper load block and/or ball. (4) How to react to changes in conditions that affect the safe operation of the equipment. (5) How to shut down and secure the equipment properly when leaving it unattended. (6) Know how to apply the manufacturer's specifications for operating in various weather conditions, and understand how environmental conditions affect the safe operation of the equipment. (7) How to properly level the equipment.		The Federal Appendix C is information only and is therefore unenforceable language.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(8) How to verify the weight of the load and rigging prior to initiating the lift. (9) How to determine where the load is to be picked up and placed and how to verify the radii. (10) Know basic rigging procedures. (11) How to carry out the shift inspection required in this subpart. (12) Know that the following operations require specific procedures and skill levels: (i) Multi-crane lifts. (ii) Hoisting personnel. (iii) Clamshell/dragline operations. (iv) Pile driving and extracting. (v) Concrete operations, including poured-in-place and tilt-up. (vi) Demolition operations. (vii) Operations on water. (viii) Magnet operations. (ix) Multi-drum operations. (13) Know the proper procedures for operating safely under the following conditions: (i) Traveling with suspended loads. (ii) Approaching a two-block condition. (iii) Operating near power lines. (iv) Hoisting personnel. (v) Using other than full outrigger/crawler or stabilizer extensions. (vi) Lifting loads from beneath the surface of the water. (vii) Using various approved counterweight configurations. (viii) Handling loads out of the operator's vision ("operating in the blind"). (ix) Using electronic communication systems for signal communication. (14) Know the proper procedures for load control and the use of hand-held tag lines. (15) Know the emergency response procedure for: (i) Fires. (ii) Power line contact.		The Federal Appendix C is information only and is therefore unenforceable language.

SOURCE OF FEDERAL OSHA STANDARD(S): 29 CFR 1926

SCOPE: Applicable throughout state unless otherwise noted.

FEDERAL: § 1926. 1427-.1442	STATE: General Industry Safety Orders (GISO)	RATIONALE
(iii) Loss of stability. (iv) Control malfunction. (v) Two-blocking. (vi) Overload. (vii) Carrier or travel malfunction. (16) Know how to properly use outriggers and stabilizers in accordance with manufacturer specifications. (d) Use of load charts. (1) Know the terminology necessary to use load charts. (2) Know how to ensure that the load chart is the appropriate chart for the equipment in its particular configuration and application. (3) Know how to use load charts. This includes knowing: (i) The operational limitations of load charts and footnotes. (ii) How to relate the chart to the configuration of the crane, crawlers, or outriggers/stabilizers extended or retracted, jib erected or offset, and various counterweight configurations.		The Federal Appendix C is information only and is therefore unenforceable language.