

neither feasible to erect such barriers on the ground nor on the equipment, the hazard areas shall be clearly marked by a combination of warning signs (such as "Danger—Swing/Crush Zone" or "Danger—This Thing's Gonna Swing and Crunch You—Zone") and high visibility markings on the equipment that identify the hazard areas. In addition, the employer shall train the employees to understand what these markings signify.

(3) *Protecting employees in the hazard area.*

(i) Before an employee goes to a location in the hazard area that is out of view of the operator, the employee (or someone instructed by the employee) must ensure that the operator is informed that he/she is going to that location.

(ii) Where the operator knows that an employee went to a location covered by paragraph (a)(1) of this section, the operator shall not rotate the superstructure until the operator:

(A) Gives a warning that is understood by the employee as a signal that the superstructure is about to be rotated and allows time for the employee to get to a safe position, or

(B) Is informed in accordance with a pre-arranged system of communication that the employee is in a safe position.

(b) *Multiple equipment coordination.* Where any part of a crane/derrick is within the working radius of another crane/derrick, the controlling entity shall institute a system to coordinate operations. If there is no controlling entity, the employers shall institute such a system.

§ 1926.1425 Keeping clear of the load.

(a) Where available, hoisting routes that minimize the exposure of employees to hoisted loads shall be used, to the extent consistent with public safety.

(b) While the operator is not moving a suspended load, no employee shall be within the fall zone, except for employees:

(1) Engaged in hooking, unhooking or guiding a load, or

(2) Engaged in the initial attachment of the load to a component or structure, or

(3) Operating a concrete hopper or concrete bucket.

(c) When employees are engaged in hooking, unhooking, or guiding the load, or in the initial connection of a load to a component or structure and are within the fall zone, the following criteria shall be met:

(1) The materials being hoisted shall be rigged to prevent unintentional displacement.

(2) Hooks with self-closing latches or their equivalent shall be used. Exception: "J" hooks are permitted to be used for setting wooden trusses.

(3) The materials shall be rigged by a qualified rigger.

(d) Receiving a load. Only employees needed to receive a load shall be permitted to be within the fall zone when a load is being landed.

(e) During a tilt-up or tilt-down operation:

(1) No employee shall be directly under the load.

(2) Only employees essential to the operation shall be in the fall zone (but not directly under the load).

Note to § 1926.1425: Boom free fall is prohibited when an employee is in the fall zone of the boom or load, and load line free fall is prohibited when an employee is directly under the load; see § 1926.1426.

§ 1926.1426 Free fall and controlled load lowering.

(a) *Boom free fall prohibitions.*

(1) The use of equipment in which the boom is designed to free fall (live boom) is prohibited in each of the following circumstances:

(i) An employee is in the fall zone of the boom or load.

(ii) An employee is being hoisted.

(iii) The load or boom is directly over a power line, or over any part of the area extending the Table A (of § 1926.1408) clearance distance to each side of the power line.

(iv) The load is over a shaft.

(v) The load is over a cofferdam, except where there are no employees in the fall zone.

(vi) Lifting operations are taking place in a refinery or tank farm.

(2) The use of equipment in which the boom is designed to free fall (live boom) is permitted only where none of the circumstances listed in paragraph (a)(1) of this section are present and:

(i) The equipment was manufactured prior to October 31, 1984, or

(ii) The equipment is a floating crane/derrick or a land crane/derrick on a vessel/flotation device.

(b) *Preventing boom free fall.* Where the use of equipment with a boom that is designed to free fall (live boom) is prohibited (see paragraph (a)(1) of this section), the boom hoist shall have a secondary mechanism or device designed to prevent the boom from falling in the event the primary system used to hold or regulate the boom hoist fails, as follows:

(1) Friction drums shall have:

(i) A friction clutch and, in addition, a braking device, to allow for controlled boom lowering.

(ii) A secondary braking or locking device, which is manually or

automatically engaged, to back-up the primary brake while the boom is held (such as a secondary friction brake or a ratchet and pawl device).

(2) Hydraulic drums shall have an integrally mounted holding device or internal static brake to prevent boom hoist movement in the event of hydraulic failure.

(3) Neither clutches nor hydraulic motors shall be considered brake or locking devices for purposes of this subpart.

(4) Hydraulic boom cylinders shall have an integrally mounted holding device.

(c) *Preventing uncontrolled retraction.* Hydraulic telescoping booms shall have an integrally mounted holding device to prevent the boom from retracting in the event of hydraulic failure.

(d) *Load line free fall.* In each of the following circumstances, controlled load lowering is required and free fall of the load line hoist is prohibited:

(1) An employee is directly under the load.

(2) An employee is being hoisted.

(3) The load is directly over a power line, or over any part of the area extending the Table A clearance distance to each side of the power line.

(4) The load is over a shaft or cofferdam.

§ 1926.1427 Operator qualification and certification.

(a) The employer must ensure that, prior to operating any equipment covered under § 1926.1400, the operator is either qualified or certified to operate the equipment in accordance with one of the options in paragraphs (b) through (e) of this section, or is operating the equipment during a training period in accordance with paragraph (f) of this section. Exceptions: Operator qualification or certification under this section is not required for operators of derricks (see § 1926.1436), sideboom cranes (see § 1926.1440), and equipment with a rated hoisting/lifting capacity of 2,000 pounds or less (see § 1926.1441).

(b) *Option 1: Certification by an accredited crane/derrick operator testing organization.*

(1) For a testing organization to be considered accredited to certify operators under this subpart, it must:

(i) Be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel have been met.

(ii) Administer written and practical tests that:

(A) Assess the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section.

(B) Provide different levels of certification based on equipment capacity and type.

(iii) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified.

(iv) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section.

(v) Have its accreditation reviewed by the nationally recognized accrediting agency at least every three years.

(2) A certification issued under this option is portable.

(3) A certification issued under this paragraph (b) is valid for 5 years.

(c) *Option 2: Qualification by an audited employer program.* The employer's qualification of its employee shall meet the following requirements:

(1) The written and practical tests shall be either:

(i) Developed by an accredited crane/derrick operator testing organization (see paragraph (b) of this section), or

(ii) Approved by an auditor in accordance with the following requirements:

(A) The auditor is certified to evaluate such tests by an accredited crane/derrick operator testing organization (see paragraph (b) of this section).

(B) The auditor is not an employee of the employer.

(C) The approval shall be based on the auditor's determination that the written and practical tests meet nationally recognized test development criteria and are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section.

(2) *Administration of tests.*

(i) The written and practical tests shall be administered under circumstances approved by the auditor as meeting nationally recognized test administration standards.

(ii) The auditor shall be certified to evaluate the administration of the written and practical tests by an accredited crane/derrick operator testing organization (see paragraph (b) of this section).

(iii) The auditor shall not be an employee of the employer.

(iv) The audit shall be conducted in accordance with nationally recognized auditing standards.

(3) The employer program shall be audited within 3 months of the

beginning of the program and every 3 years thereafter.

(4) The employer program shall have testing procedures for re-qualification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section. The re-qualification procedures shall be audited in accordance with paragraphs (c)(1) and (2) of this section.

(5) *Deficiencies.* If the auditor determines that there is a significant deficiency ("deficiency") in the program, the employer shall ensure that:

(i) No operator is qualified until the auditor confirms that the deficiency has been corrected.

(ii) The program is audited again within 180 days of the confirmation that the deficiency was corrected.

(iii) The auditor files a documented report of the deficiency to the appropriate Regional Office of the Occupational Safety and Health Administration within 15 days of the auditor's determination that there is a deficiency.

(iv) Records of the audits of the employer's program are maintained by the auditor for three years and are made available by the auditor to the Secretary of Labor or her designated representative upon request.

(6) A qualification under this paragraph (c) is:

(i) Not portable.

(ii) Valid for 5 years.

(d) *Option 3. Qualification by the U.S. military.*

(1) For purposes of this section, an operator is considered qualified if he/she has a current operator qualification issued by the U.S. military for operation of the equipment.

(2) A qualification under this paragraph (d) is:

(i) Not portable.

(ii) Valid for the period of time stipulated by the issuing entity.

(e) *Option 4. Licensing by a government entity.*

(1) For purposes of this section, a government licensing department/office that issues operator licenses for operating equipment covered by this standard is considered a government accredited crane/derrick operator testing organization if the criteria in paragraph (e)(2) of this section are met.

(2) *Licensing criteria.*

(i) The requirements for obtaining the license include an assessment, by written and practical tests, of the operator applicant regarding, at a minimum, the knowledge and skills listed in paragraphs (j)(1) and (2) of this section.

(ii) The testing meets industry recognized criteria for written testing

materials, practical examinations, test administration, grading, facilities/equipment and personnel.

(iii) The government authority that oversees the licensing department/office, has determined that the requirements in paragraphs (e)(2)(i) and (ii) of this section have been met.

(iv) The licensing department/office has testing procedures for re-licensing designed to ensure that the operator continues to meet the technical knowledge and skills requirements in paragraphs (j)(1) and (2) of this section.

(3) A license issued by a government accredited crane/derrick operator testing organization that meets the requirements of this option:

(i) Meets the operator qualification requirements of this section for operation of equipment only within the jurisdiction of the government entity.

(ii) Is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.

(f) *Pre-qualification/certification training period.*

(1) An employee who is not qualified or certified under this section is permitted to operate equipment where the requirements of paragraph (f)(2) of this section are met.

(2) An employee who has not passed both the written and practical tests required under this section is permitted to operate equipment as part of his/her training where the following requirements are met:

(i) The employee ("trainee/apprentice") shall be provided with sufficient training prior to operating the equipment to enable the trainee to operate the equipment safely under limitations established by this section (including continuous supervision) and any additional limitations established by the employer.

(ii) The tasks performed by the trainee/apprentice while operating the equipment shall be within the trainee's ability.

(iii) *Supervisor.* While operating the equipment, the trainee/apprentice shall be continuously supervised by an individual ("operator's supervisor") who meets the following requirements:

(A) The operator's supervisor is an employee or agent of the trainee's/apprentice's employer.

(B) The operator's supervisor is either a certified operator under this section, or has passed the written portion of a certification test under one of the options in paragraphs (b) through (e) of this section, and is familiar with the proper use of the equipment's controls.

(C) While supervising the trainee/apprentice, the operator's supervisor performs no tasks that detract from the

supervisor's ability to supervise the trainee/apprentice.

(D) For equipment other than tower cranes: the operator's supervisor and the trainee/apprentice shall be in direct line of sight of each other. In addition, they shall communicate verbally or by hand signals. For tower cranes: the operator's supervisor and the trainee/apprentice shall be in direct communication with each other.

(iv) *Continuous supervision.* The trainee/apprentice shall be supervised by the operator's supervisor at all times, except for short breaks where the following are met:

(A) The break lasts no longer than 15 minutes and there is no more than one break per hour.

(B) Immediately prior to the break the operator's supervisor informs the trainee/apprentice of the specific tasks that the trainee/apprentice is to perform and limitations that he/she is to adhere to during the operator supervisor's break.

(C) The specific tasks that the trainee/apprentice will perform during the operator supervisor's break are within the trainee's/apprentice's abilities.

(v) The trainee/apprentice shall not operate the equipment in any of the following circumstances:

(A) If any part of the equipment, load line or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone (see § 1926.1408(a)(1)), could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV.

(B) If the equipment is used to hoist personnel.

(C) In multiple-equipment lifts.

(D) If the equipment is used over a shaft, cofferdam, or in a tank farm.

(E) For multiple-lift rigging, except where the operator's supervisor determines that the trainee's/apprentice's skills are sufficient for this high-skill work.

(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.

(h) Written tests under this section are permitted to be administered verbally, with answers given verbally, where the operator candidate:

(1) Passes a written demonstration of literacy relevant to the work.

(2) Demonstrates the ability to use the type of written manufacturer procedures applicable to the class/type of equipment for which the candidate is seeking certification.

(i) [Reserved.]

(j) *Certification criteria.* Qualifications and certifications must be based, at a minimum, on the following:

(1) A determination through a written test that:

(i) The individual knows the information necessary for safe operation of the specific type of equipment the individual will operate, including the following:

(A) The controls and operational/performance characteristics.

(B) Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.

(C) Procedures for preventing and responding to power line contact.

(D) Technical knowledge similar to the subject matter criteria listed in Appendix E of this subpart applicable to the specific type of equipment the individual will operate. Use of the Appendix E of this subpart criteria meets the requirements of this provision.

(E) Technical knowledge applicable to:

(1) The suitability of the supporting ground and surface to handle expected loads.

(2) Site hazards.

(3) Site access.

(F) This subpart, including applicable incorporated materials.

(ii) The individual is able to read and locate relevant information in the equipment manual and other materials containing information referred to in paragraph (j)(1)(i) of this section.

(2) A determination through a practical test that the individual has the skills necessary for safe operation of the equipment, including the following:

(i) Ability to recognize, from visual and audible observation, the items listed in § 1926.1412(d) (shift inspection).

(ii) Operational and maneuvering skills.

(iii) Application of load chart information.

(iv) Application of safe shut-down and securing procedures.

(k) *Phase-in.*

(1) As of the effective date of this subpart, until four years after the effective date of the subpart, the following requirements apply:

(i) Operators of equipment covered by this standard are required to be competent to operate the equipment safely.

(ii) Where an employee assigned to operate machinery does not have the required knowledge or ability to operate the equipment safely, the employee shall be provided with the necessary training prior to operating the equipment. The employer shall ensure

that the operator is evaluated to confirm that he/she understands the information provided in the training.

(2) The effective date of paragraphs (a) through (j) and (m) of this section is [4 YEARS AFTER THE EFFECTIVE DATE OF THE FINAL RULE].

(l) [Reserved.]

(m) *Definitions.*

(1) "*Portable.*" Any employer of an operator with a certification that is portable under this section meets the requirements of paragraph (a) of this section with respect to that operator.

(2) "*Not portable.*" Where an operator has a qualification that is not portable under this section, the qualification meets the requirements of paragraph (a) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the qualification.

§ 1926.1428 Signal person qualifications.

(a) The employer of the signal person shall ensure that each signal person meets the Qualification Requirements (paragraph (c) of this section) prior to giving any signals. This requirement shall be met by using either Option (1) or Option (2) (see paragraphs (a)(1) and (a)(2) of this section).

(1) *Option (1)—Third party qualified evaluator.* The signal person has documentation from a third party qualified evaluator showing that the signal person meets the Qualification Requirements (see paragraph (c) of this section).

(2) *Option (2)—Employer's qualified evaluator.* The employer has its qualified evaluator assess the individual and determine that the individual meets the Qualification Requirements (see paragraph (c) of this section) and provides documentation of that determination. An assessment by an employer's qualified evaluator under this option is not portable—other employers are not permitted to use it to meet the requirements of this section.

(3) The documentation for whichever option is used shall be available while the signal person is employed by the employer.

(b) If subsequent actions by the signal person indicate that the individual may not meet the Qualification Requirements (see paragraph (c) of this section), the employer must not allow the individual to continue working as a signal person until retraining is provided and a reassessment is made in accordance with paragraph (a) of this section that confirms that the individual meets the Qualification Requirements.

(c) *Qualification Requirements.* Each signal person must:

(1) Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals.

(2) Be competent in the application of the type of signals used.

(3) Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.

(4) Know and understand the relevant requirements of § 1926.1419 through § 1926.1422 and § 1926.1428.

(5) Demonstrate that he/she meets the requirements in paragraph (c)(1) through (4) of this section through a verbal 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 the following requirements are met:

(1) The operation is limited to those functions necessary to perform maintenance, inspect or verify the performance of the equipment.

(2) The personnel either:

(i) Operate the equipment under the direct supervision of an operator who meets the requirements of § 1926.1427 (Operator qualification and certification), or

(ii) Are familiar with the operation, safe limitations, characteristics and hazards associated with the type of equipment.

(b) Maintenance and repair personnel shall meet the definition of a qualified person with respect to the equipment and maintenance/repair tasks performed.

§ 1926.1430 Training.

The employer shall provide training as follows:

(a) *Overhead powerlines.* Employees specified in § 1926.1408(g) (Power line safety; training) shall be trained in accordance with the requirements of that paragraph.

(b) *Signal persons.* Employees who will be assigned to work as signal persons who do not meet the requirements of § 1926.1428(c) shall be trained in the areas addressed in that paragraph.

(c) *Operators.*

(1) Operators who are not qualified or certified under § 1926.1427 shall be trained in the areas addressed in § 1926.1427(j). Retraining shall be provided if necessary for re-qualification or re-certification or if the operator does not pass a qualification or certification test.

(2) Operators shall be trained in the following practices:

(i) On friction equipment, whenever moving a boom off a support, first raise the boom a short distance (sufficient to take the load of the boom) to determine if the boom hoist brake needs to be adjusted. On other types of equipment, the same practice is applicable, except that typically there is no means of adjusting the brake; if the brake does not hold, a repair is necessary.

(ii) Where available, the manufacturer's emergency procedures for halting unintended equipment movement.

(d) *Competent persons and qualified persons.* Competent persons and qualified persons shall be trained regarding the requirements of this subpart applicable to their respective roles.

(e) *Crush/pinch points.* Employees who work with the equipment shall be instructed to keep clear of holes, and crush/pinch points and the hazards addressed in § 1926.1424 (Work area control).

(f) *Tag-out.* Operators and other employees authorized to start/energize equipment or operate equipment controls (such as maintenance and repair employees), shall be trained in the tag-out procedures in § 1926.1417(f).

(g) *Training administration.*

(1) The employer shall ensure that employees required to be trained under this subpart are evaluated to confirm that they understand the information provided in the training.

(2) Refresher training in relevant topics shall be provided when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.

§ 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 worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold, would be more hazardous, or is not possible because of the project's structural design or worksite conditions. This paragraph does not apply to work covered by subpart R (Steel Erection) of this part.

(b) *Use of personnel platform.*

(1) When using equipment to hoist employees, the employees shall be in a personnel platform that meets the

requirements of paragraph (e) of this section.

(2) *Exceptions:* A personnel platform is not required for hoisting employees:

(i) Into and out of drill shafts that are up to and including 8 feet in diameter (see paragraph (o) of this section for requirements for hoisting these employees).

(ii) In pile driving operations (see paragraph (p) of this section for requirements for hoisting these employees).

(iii) Solely for transfer to or from a marine worksite in a marine hoisted personnel transfer device (see paragraph (r) of this section for 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).

(c) *Equipment set-up.*

(1) The equipment shall be uniformly level, within one percent of level grade, and located on footing that a qualified person has determined to be sufficiently firm and stable.

(2) Equipment with outriggers shall have them all extended and locked. The amount of extension shall be the same for all outriggers and in accordance with manufacturer procedures and load charts.

(d) *Equipment criteria.*

(1) *Capacity: use of suspended personnel platforms.* The total load (with the platform loaded, including the hook, load line and rigging) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.

(2) *Capacity: use of boom-attached personnel platforms.* The total weight of the loaded personnel platform shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment (except during proof testing).

(3) *Capacity: hoisting personnel without a personnel platform.* When hoisting personnel without a personnel platform pursuant to paragraph (b)(2) of this section, the total load (including the hook, load line, rigging and any other equipment that imposes a load) shall not exceed 50 percent of the rated capacity for the radius and configuration of the equipment, except during proof testing.

(4) When the occupied personnel platform is in a stationary working position, the load and boom hoist brakes, swing brakes, and operator actuated secondary braking and locking features (such as pawls or dogs) or automatic secondary brakes shall be engaged.

(5) *Devices.*