

July 6, 2004

**1422 Operator qualification and certification.**

(a) The employer must ensure that, prior to operating any equipment covered under Section 1400, the operator is either qualified or certified to operate the equipment in accordance with one of the Options in paragraphs (b) – (f), or is operating the equipment during a training period in accordance with paragraph (g).

(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 (k)(1) and (2) and Appendix Q.

(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 (k)(1) and (2) and Appendix Q.

(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 is valid for 5 years.

(c) *Option (2): Certification by an accredited educational institution or program.*

(1) For purposes of this paragraph, for an educational institution or program to be considered accredited, it must meet the requirements of at least one of the following:

- (i) Be accredited by a national or regional accrediting agency listed by the U.S. Secretary of Education (SOE).
- (ii) Be accredited by a State agency that has been recognized by the SOE for approval of public postsecondary vocational education.

(2) For an accredited educational institution or program to certify operators under this Subpart, it must:

- (i) Meet industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment and personnel.
- (ii) Administer written and practical tests that assess the operator applicant regarding, at a minimum, the knowledge and skills listed in (k)(1) and (2) and Appendix Q.
- (iii) Provide different levels of certification based on equipment capacity and type.
- (iv) Have procedures for operators to re-apply and be re-tested in the event an operator applicant fails a test or is decertified.
- (v) Have testing procedures for re-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in (k)(1) and (2) and Appendix Q.

(3) A certification issued under this Option is portable.

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

(d) *Option (3): 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)), or an accredited educational institution or program (see paragraph (c)), or
  - (ii) Approved by an auditor in accordance with the following requirements:

(A) The auditor is certified to evaluate such tests by either: an accredited crane/derrick operator testing organization (see paragraph (b)), or an accredited educational institution or program that meets the requirements of paragraph (c).

(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 are valid and reliable in assessing the operator applicants regarding, at a minimum, the knowledge and skills listed in (k)(1) and (2) and in Appendix Q.

(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 either: an accredited crane/derrick operator testing organization (see paragraph (b)), or an accredited educational institution or program that meets the requirements of paragraph (c).

(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-certification designed to ensure that the operator continues to meet the technical knowledge and skills requirements in (k)(1) and (2) and Appendix Q. The re-certification procedures shall be audited in accordance with paragraph (d)(1) and (2).

(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 is:

(i) Not portable.

(ii) Valid for 5 years.

(e) *Option (4). 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 is:

(i) Not portable.

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

(f) *Option (5). 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 (f)(2) 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 (k)(1) and (2) and in Appendix Q.

(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 (2)(i) and (ii) have been met.

(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.

(g) *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 (g)(2) are met.

(2) An employee who has passed neither the written nor 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") 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 while operating the equipment shall be within the trainee's ability.

(iii) *Supervisor.* While operating the equipment, the trainee 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 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) - (f), and is familiar with the proper use of the equipment's controls.

(C) While supervising the trainee, the operator's supervisor performs no tasks that detract from the supervisor's ability to supervise the trainee.

(D) The operator's supervisor and the trainee shall be in direct line of sight of each other. In addition, they shall communicate verbally or by hand signals.

(iv) *Continuous supervision.* The trainee shall be supervised by the operator's supervisor at all times, except for short breaks where the following is 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 supervisor informs the trainee of the specific tasks that the trainee is to perform and limitations that the trainee is to adhere to during the supervisor's break.

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

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

(A) If any part of the crane, load line or load (including rigging and lifting accessories), if operated up to the crane's maximum working radius in the work zone (see paragraph 14XX(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-crane lifts.

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

(h) 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.

(i) [Reserved].

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

(k) *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 Q applicable to the specific type of equipment the individual will operate. Use of the Appendix Q 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.

(D) 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 (i), where written in a language in which the individual is literate.

(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 section 1415(c) (pre-shift inspection).

(ii) Operational and maneuvering skills.

(iii) Application of load chart information.

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

(l) [Reserved].

(m) *Phase-in.*

(1) As of the effective date of this standard, until four years after the effective date of the standard, 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) – (k) and (where required) Appendix Q, is [4 years after the effective date of the standard].

( ) *Definitions.*

(1) “*Portable.*” Any employer of an operator with a certification that is portable under this Section meets the requirements of paragraph (a) 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) only where the operator is employed by (and operating the equipment for) the employer that issued the qualification.

## APPENDIX Q

### APPENDIX D TO § 1926.1422 – 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. Use of this Appendix is mandatory under Section 1422.

(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 Sections 1418 and 1419.
  - (ii) Capacity and when multi-part rope is needed.
  - (iii) Relationship between line pull and safe working load.
  - (iv) How to determine the manufacturer's recommended rope for the crane.
- (3) Rigging devices and their use, such as:
  - (i) Slings.
  - (ii) Spreaders.
  - (iii) Lifting beams.
  - (iv) Wire rope fittings, such as clips, shackles and wedge sockets.
  - (v) Saddles (softeners).
  - (vi) Clamps (beams).
- (4) The technical limitations of protective measures against electrical hazards:
  - (i) Grounding.
  - (ii) Proximity warning devices.
  - (iii) Insulated links.
  - (iv) Boom cages.
  - (v) Proximity to electric power lines, radii, and microwave structures.
- (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 pre-operation and inspection.
  - (11) How to use the safety devices and operational aids required under §§ 1414 and 14XX.
  - (12) The difference between duty-cycle and lifting operations.
  - (13) How to calculate net capacity for every possible configuration of the equipment using the manufacturer's load chart.
  - (14) How to use manufacturer-approved attachments and their effect on the equipment.
  - (15) How to obtain dimensions, weight, and center of gravity of the load.
  - (16) The effects of dynamic loading from:
    - (i) Wind.
    - (ii) Stopping and starting.
    - (iii) Impact loading.
    - (iv) Moving with the load.
  - (17) The effect of side loading.
  - (18) The principles of backward stability.
- (b) Site information.
- (1) How to identify the suitability of the supporting ground/surface to support the expected loads of the operation. Elements include:
    - (i) Weaknesses below the surface (such as voids, tanks, loose fill).
    - (ii) Weaknesses on the surface (such as retaining walls, slopes, excavations, depressions).

- (2) Proper use of mats, blocking/cribbing and outriggers 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 the manufacturer's specifications for operating in various weather conditions, and understand how environmental conditions affect the safe operation of the equipment.
- (7) How to properly level the equipment.
- (8) How to verify the weight of the load and rigging prior to initiating the lift.
- (9) [How to determine where the load is to be picked up and placed and how to verify the radii.
- (10) Know basic rigging procedures.
- (11) How to carry out the shift inspection required in this Subpart.
- (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 extensions.
- (vi) Lifting loads from beneath the surface of the water.
- (vii) Using various approved counterweight configurations.
- (viii) Handling loads out of the operator's vision ("operating in the blind").
- (ix) Using electronic communication systems for signal communication.

(14) Know the proper procedures for load control and the use of hand-held tag lines.

(15) Know the emergency response procedure for:

- (i) Fires.

- (ii) Power line contact.
- (iii) Loss of stability.
- (iv) Control malfunction.
- (v) Two-blocking.
- (vi) Overload.
- (vii) Carrier or travel malfunction.

(16) Know how to properly use outriggers 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 extended or retracted, jib erected or offset, and various counterweight configurations.
  - (iii) The difference between structural capacity and capacity limited by stability.
  - (iv) What is included in load chart capacity.
  - (v) The range diagram and its relationship to the load chart.
  - (vi) The work area chart and its relationship to the load chart.
  - (vii) Where to find and how to use the “parts-of-line” information.
- (4) Know how to use the load chart together with the load indicators and/or load moment devices.