

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1926

[Docket ID—OSHA—2007—0066]

RIN 1218—AC96

Cranes and Derricks in Construction: Operator Qualification

AGENCY: Occupational Safety and Health Administration (OSHA), Labor.

ACTION: Final rule.

SUMMARY: OSHA is updating the agency's standard for cranes and derricks in construction by clarifying each employer's duty to ensure the competency of crane operators through training, certification or licensing, and evaluation. OSHA is also altering a provision that required different levels of certification based on the rated lifting capacity of equipment. While testing organizations are not required to issue certifications distinguished by rated capacities, they are permitted to do so, and employers may accept them or continue to rely on certifications based on crane type alone. Finally, this rule establishes minimum requirements for determining operator competency. This final rule will maintain safety and health protections for workers while reducing compliance burdens.

DATES: *Effective date:* This final rule is effective on December 10, 2018, except the amendments to 29 CFR 1926.1427(a) and (f) (evaluation and documentation requirements), which are effective February 7, 2019.

Compliance date: See Section C., Paperwork Reduction Act, of this document regarding dates of compliance with collections of information in this final rule.

ADDRESSES: In accordance with 28 U.S.C. 2112(a)(2), the agency designates Edmund C. Baird, Acting Associate Solicitor of Labor for Occupational Safety and Health, Office of the Solicitor, Room S-4004, U.S. Department of Labor, 200 Constitution Avenue NW, Washington, DC 20210, to receive petitions for review of the final rule.

Docket: To read or download material in the electronic docket for this rulemaking, go to <http://www.regulations.gov> or to the OSHA Docket Office at Technical Data Center, Room N-3653, OSHA, U.S. Department of Labor, 200 Constitution Avenue NW, Washington, DC 20210; telephone: (202) 693-2350, TTY number (877) 889-5627. Some information submitted (e.g.,

copyrighted material) is not available publicly to read or download through this website. All submissions, including copyrighted material, are available for inspection at the OSHA Docket Office. Contact the OSHA Docket Office for assistance in locating docket submissions.

FOR FURTHER INFORMATION CONTACT:

General information and press inquiries: Mr. Frank Meilinger, OSHA Office of Communications; telephone: (202) 693-1999; email: Meilinger.Francis2@dol.gov.

Technical inquiries: Mr. Vernon Preston, Directorate of Construction; telephone: (202) 693-2020; fax: (202) 693-1689; email: preston.vernon@dol.gov.

Copies of this Federal Register notice and news releases: Electronic copies of these documents are available at OSHA's web page at <http://www.osha.gov>.

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I. Executive Summary

OSHA is amending 29 CFR 1926 subpart CC to revise sections that address crane operator training, certification/licensing,¹ and

¹ The term "certification/licensing" covers each of the certification options in the proposed rule (third-party certification or an audited employer certification program) as well as state or local operator licensing requirements. Operators employed by the U.S. military are also addressed

competency. The purposes of these amendments are to alter the requirement that crane-operator certification be based on equipment "type and capacity," instead permitting certification based on equipment "type" or "type and capacity"; continue requiring training of operators; clarify and continue the employer duty to evaluate operators for their ability to safely operate equipment covered by subpart CC; and require documentation of that evaluation.

This rule alters the requirement that crane operators be certified by equipment "type and capacity," which, based on the record, creates regulatory burden without additional safety benefit and artificially limits the potential for crane operators to obtain certification. Allowing certification by equipment "type" or "type and capacity" removes a regulatory burden that did not create an additional safety benefit.

This rule continues to require operator training. It likewise clarifies and continues the employer duty to evaluate operators for their ability to safely use equipment. Just as an employee's driver's license does not guarantee the employee's ability to drive all vehicles safely in all conditions an employer may require, crane-operator certification alone does not ensure that an operator has sufficient knowledge and skill to safely use all equipment. The record makes clear that employers need to evaluate operators and provide training when needed to ensure that they can safely operate cranes in a variety of circumstances. Similarly, and also consistent with many employers' current practices, employer evaluation of a crane operator's experience and competency with respect to the particular equipment assigned is essential to ensuring the safe operation of cranes on construction sites. This final rule accordingly continues the common-sense requirements that employers train operators and assess their competence and ability to work safely.

OSHA's final economic impact analysis determined that the most significant costs of the changes to the standard are associated with the requirements to perform the operator competency evaluation, document the evaluations, and provide any additional training needed by operators. OSHA estimates employers impacted by this rule employ approximately 117,130 crane operators. OSHA accordingly estimates the annual cost to the industry

in this standard and must be "qualified" by the military. OSHA is not making any substantive changes to the military qualification provision.

will be \$1,481,000 for the performance of operator competency evaluations, \$62,000 for documenting those evaluations, and \$94,000 for any additional training needed for operators. OSHA's estimate of the total annual cost of compliance is \$1,637,000.

OSHA also expects some cost savings from the changes to the rule. In particular, OSHA estimates a large one-time cost savings of \$25,678,000 from dropping the requirement that crane operators be certified by capacity because that change eliminates the need for a very large number of operators to get an additional certification. OSHA also estimates that a small number of ongoing annual certifications due to an operator moving to a higher capacity crane would also no longer be needed, producing an additional annual cost savings of \$426,000. These various elements lead, at a 3 percent discount rate over 10 years, to net annual cost savings of \$1,752,000. At a discount rate of 7 percent there are annual cost savings of \$2,388,000.

The agency has concluded that, on average, the impact of costs on employers will be low because most employers are currently providing some degree of operator training and performing operator competency evaluations to comply with the previous 29 CFR 1926.1427(k), and were previously doing so to comply with §§ 1926.550, 1926.20(b)(4), and 1926.21(b)(2). Employers who currently provide insufficient training will incur new compliance costs. Although OSHA anticipates that a few employers might incur significant new costs, the agency has concluded that, for purposes of the Regulatory Flexibility Act, the changes to the standard will not have a significant economic impact on a substantial number of small entities.

The agency has also determined that the final rule is technologically feasible because many employers already comply with all the provisions of the revised rule and the revised rule would not require any new technology. In addition, because the vast majority of employers already invest the resources necessary to comply with the provisions of the revised standard, the agency concludes that the revised standard is economically feasible.

II. Background

Explanation of record citations in this document.

References in parentheses in this preamble are to exhibits or transcripts in the docket for this rulemaking. Documents from the subpart CC—Cranes and Derricks in Construction rulemaking record are available under

Docket OSHA-2007-0066 on the Federal eRulemaking Portal at <http://www.regulations.gov> or in the OSHA Docket Office. The term "ID" refers to the column labeled "ID" under Docket No. OSHA-2007-0066 on <http://www.regulations.gov>. This column lists individual records in the docket. This notice will identify each of these records only by the last four digits of the record, such as "ID-0032" for OSHA-2007-0066-0032. Identification of records from dockets other than records in OSHA-2007-0066 will be by their full ID number.

A. Operator Competency Requirements

OSHA promulgated a new standard for cranes and derricks in construction, referred to in the Background section as the "2010 crane standard," on November 10, 2010 (75 FR 47905). It was based on a proposal drafted as the result of negotiated rulemaking and issued on October 9, 2008 (73 FR 59714). Under this cranes standard, except for employees of the U.S. military and the operation of some specified equipment, employers were required to allow only certified operators to operate equipment after November 10, 2014.² In lieu of certification, the rule also allowed operators to operate cranes if licensed by state or local governments whose programs met certain minimum requirements.

This cranes standard included a four-year, phased-in effective date for the certification requirements. That phase-in period was intended to provide time for existing accredited testing organizations to develop programs that complied with the standard's requirements; for operators and employers to prepare for certification testing; and for more testing organizations to become accredited to make certifications available for the operation of the wide variety of cranes used in construction. During the phase-in period, employers were required to continue complying with two broad provisions: to ensure that crane operators were competent to operate the equipment safely and, if necessary, to train and evaluate employees who did not have the required knowledge or ability to operate the equipment safely (§ 1926.1427(k)(2)(i) and (ii)) ("employer duties"). These employer duties are essentially the same as those required by § 1926.20(b)(4) and § 1926.21(b)(2), which are discussed in more detail in

² The term "equipment" was used in the cranes standard's regulatory text because the rule covers cranes, derricks and other types of equipment. When OSHA uses "cranes" in this preamble, it is meant to apply to all covered equipment.

the "Operator Certification Requirement" section that follows.

B. Operator Certification Requirement

In 1979, OSHA published 29 CFR 1926.550, which specified requirements for crane and derrick operation that were adopted from existing consensus standards. Among these requirements was an employer's duty to comply with manufacturer specifications and limitations (§ 1926.550(a)(1)). In addition, employers were subject to general requirements elsewhere in the OSHA construction safety standards that required employers to permit only those employees "qualified by training or experience" to operate equipment (§ 1926.20(b)(4)) and to "instruct each employee in the recognition and avoidance of unsafe conditions" (§ 1926.21(b)(2)). However, crane incidents continued to be a significant cause of injuries and fatalities in the construction industry over the next few decades. In response, industry stakeholders called on OSHA to update its existing construction crane standard, including addressing advances in equipment technology and industry-recognized work practices.

Between 1998 and 2003, OSHA's Advisory Committee for Construction Safety and Health (ACCSH) tasked a workgroup with studying crane issues and ultimately recommended that OSHA revise the construction crane standard through negotiated rulemaking. The ACCSH workgroup reviewed the requirements of the most recent American Society of Mechanical Engineers (ASME)/American National Standard Institute (ANSI) B30 series standards applicable to various types of cranes and recommended that OSHA include work practices and protections from the ASME/ANSI B30 series standards in the new crane standard to the extent possible. The workgroup's recommendations included a request that OSHA require training and qualification provisions specific to crane operators, such as those of the ANSI B30 series, to supplant and augment the general provisions under §§ 1926.21(b)(2) and 1926.20(b)(4) (see ACCSH transcript Docket ID OSHA-ACCSH2002-2-2006-0194; pp. 129-135).

In 2003, OSHA commenced rulemaking by establishing a federal advisory committee, the *Cranes and Derricks Negotiated Rulemaking Advisory Committee* (C-DAC), to develop a proposal through consensus (see OSHA-S030-2006-0663-0639). The committee comprised industry stakeholders including employer users of cranes, crane manufacturers and

suppliers, labor organizations, an operator training and testing organization, a crane maintenance and repair organization, and insurers. C-DAC met eleven times between July 30, 2003, and July 9, 2004, and produced a consensus document that OSHA proposed for comment. Like the ACCSH workgroup, C-DAC acknowledged that the qualification and training requirements of §§ 1926.20(b)(4) and 1926.21(b)(2) were ineffective, and it proposed that OSHA require written and practical testing of crane operators (73 FR 59810). C-DAC also concluded that significant advances in crane/derrick safety would not be achieved without operator testing verified by accredited, third-party testing. Therefore, per C-DAC's recommendation, OSHA's proposal included a requirement for operator certification by "type and capacity" of the equipment in lieu of the previous general requirement that employers ensure their operators were competent to operate the machinery. However, OSHA proposed to retain the general employer duty during a four-year phase-in period for the operator certification (see discussion of § 1926.1427(k) at 73 FR 59938).

On October 12, 2006, ACCSH supported the C-DAC consensus document and recommended that OSHA use it as the basis of a proposed rule (see Docket ID OSHA-ACCSH2006-1-2006-0198-003).

On October 17, 2006, the Small Business Advocacy Review Panel (SBAR) submitted its final report on OSHA's draft proposal (OSHA-S030A-2006-0664-0019). The SBAR recommendations included a suggestion that OSHA solicit comment on whether "equipment capacity and type" needed clarification, which OSHA did (see 73 FR 59725). Regarding operator training, many Small Entity Representatives (SERs) thought the C-DAC's training requirements were too broad and should be focused on the equipment the operator will use and the operations to be performed. Two SERs recommended OSHA's powered industrial truck standard as a model for crane operator training requirements.

OSHA published its proposal on October 9, 2008 (73 FR 59714) and received over 350 public comments. The comments discussed a wide range of topics addressed by the crane standard. In response to requests from several public commenters, OSHA conducted a public hearing in March 2009. None of the commenters or hearing participants asked OSHA to remove the requirement that operators be certified by equipment capacity in addition to type. There were

a few stakeholders who expressed some concern about the proposal to phase-out the employer duty and replace it with the requirement for employers to ensure operator competence through third-party testing (see ID-0341-March 19, 2009, page 41 and ID-0445). However, most stakeholders overwhelmingly supported the certification requirements in the rule as proposed.

On November 8, 2010, the final rule for cranes and derricks in construction, including requirements for crane operator certification, became effective. The original date by which all operators must be certified was November 10, 2014, but OSHA subsequently extended that date to November 10, 2017 (79 FR 57785 (September 26, 2014)) and then further extended it to November 10, 2018 (82 FR 51986 (November 9, 2017)). Prior to the amendments to the standard contained in this current final rule, the separate employer duty to evaluate operators was to cease on the date when operator certification was required.

C. Certification by Crane Rated Lifting Capacity

The 2010 crane standard required operators to become certified and permitted four options for doing so, one of which is certification by a third-party organization. A third-party certification is portable (a new employer can rely on it), but in relying upon a third-party certification as confirmation of an operator's knowledge and operating skills, employers need to know what kind of equipment the certification applies to when making determinations about which equipment an operator can operate at the worksite. Therefore, C-DAC recommended the requirement, which was included in the 2010 final rule, that third-party certification must indicate the equipment types and the rated capacities that an individual is certified to operate. The other certification options, which are not portable, do not require certification by capacity.

To address the concerns that testing organizations might offer certification for a variety of crane capacities but yet not offer a certification for the particular capacity of crane matching the equipment to which operators would be assigned, OSHA added subparagraph § 1926.1427(b)(2) to the 2010 crane standard. That paragraph clarified that the certification must list the type and rated lifting capacity of the crane in which the operator was tested, and for purposes of complying with the 2010 crane standard the operator would be "deemed qualified" to operate cranes of the same type that have equal or lower rated lifting capacity of the crane in

which they were tested. During the rulemaking process for the 2010 crane standard, none of the commenters asked OSHA to remove the requirement that operators be certified by equipment capacity in addition to type.

D. Post-2010 Rulemaking Concerns

In OSHA outreach sessions following the publication of the 2010 crane standard, two accredited testing organizations that offered certifications by type but not capacity, as well as other stakeholders, questioned the need for specifying rated lifting capacities of equipment on their certifications to comply with the new 2010 crane standard. They expressed concern that meeting the capacity requirement would require significant changes from their previous certification practices without resulting in any real safety benefit because they believed that certification by capacity is not a meaningful component of operator certification testing. They asserted that employers already take steps to ensure that even certified operators are capable of safely operating the cranes at their worksites, regardless of the rated lifting capacities of those cranes. Thus, these testing organizations expressed the view that the certification by capacity requirement is unnecessary.

Those two testing organizations and many other stakeholders also expressed surprise and concern that on November 10, 2014, when OSHA's operator certification requirements were to take effect, the temporary requirements of § 1926.1427(k)(2)—the employer duty to ensure that operators are competent—would no longer be in effect and a similar requirement under 29 CFR 1926.20(b)(4), *qualification and experience*, would not apply. A number of stakeholders described this as a step backwards in safety.

OSHA also heard from many stakeholders that the employer should play a direct role in ensuring that their operators are competent because a standardized test cannot replicate all of the conditions that operators will need to safely navigate on the jobsite. They indicated that the employer typically has more information than a certifying organization to ensure that an operator has the skills, knowledge, and judgment required for safely completing a particular assignment on a particular crane. Many stakeholders likened operator certification to a learner's permit to drive a car. They cautioned that certification should be one of several factors to be weighed by an employer before allowing an employee to operate a crane.

E. Pre-NPRM Discussions With the Construction Industry Stakeholders

Discussions With Companies, Unions, and Organizations That Train, Assess, and/or Contract Crane Operators

In order to gather factual information for this rulemaking, OSHA conducted more than 40 site visits, conference calls, and meetings with stakeholders between June 6, 2013, and March 27, 2015, regarding their experiences with training, evaluating, and ensuring the competency of crane operators. Among these stakeholders were:

- 3 crane rental companies [1 large (more than 100 cranes), 1 medium (more than 20 cranes), 1 small (fewer than 20 cranes)]
- 10 construction companies that own/operate cranes [homebuilders, tank builders, propane delivery, steel erector]
 - 3 large construction/operator training companies
 - 5 crane manufacturers
 - 3 construction labor unions
 - 2 safety consultants/trainers
 - 4 state agencies
 - British Columbia's qualification program
 - 1 sole proprietor/owner operator homebuilding company
 - 3 crane insurers
 - 3 certification testing bodies and accrediting entities

During discussions with stakeholders, OSHA personnel took notes that were consolidated into draft reports, which were provided to the employer or organization for their corrections or comment before the reports were finalized. Twenty-eight of the discussions were drafted into written reports. The other conversations were not documented because they were either informal or the organization's representatives did not want their comments to be cited in the rulemaking record other than being referenced anecdotally. The twenty-eight reports, as well as a detailed summary of the reports, are in the docket for this rulemaking (ID-0673). Overall, the stakeholders described their business models for bringing cranes to construction sites, operator competency programs, methods for ensuring that cranes brought to the worksite are safely run by competent operators, and views on the use of operator certification in their operator competency programs.

F. Consulting ACCSH—Draft Proposal for Crane Operator Requirements

OSHA presented draft revisions to the 2010 cranes standard to the Advisory Committee for Construction Safety and Health (ACCSH) at a special meeting conducted March 31 and April 1, 2015,

in Washington, DC. In response, ACCSH recommended that OSHA (OSHA-2015-0002-0037):

- Move forward with the certification requirement and pursue employer qualification of crane operators.
- Clarify the requirement for certification so that certification can be by type, or by type and capacity.
- Reconsider the language in the draft revisions that appears to require the employer to observe the operator operate the crane in each and every configuration to determine whether the operator was competent.
- Use the text submitted by William Smith (OSHA-2015-0002-0051) as a substitute for the draft language on evaluation in the draft revisions.³
- Delete the annual re-evaluation provision in the draft revisions, and instead consider employer re-evaluations that coincide with the re-certification period.
- Consider adding a provision that if the operator operates the equipment in an unsafe manner, the operator must be re-evaluated by the employer.

G. Promulgation of Notice of Proposed Rulemaking

OSHA published a proposed rule on May 21, 2018 (83 FR 23534), and subsequently extended the comment period by an additional 15 days (83 FR 28562). The agency received over 1,200 public comments before the comment period closed on July 5, 2018.

H. National Consensus Standards

In adopting a standard, section 6(b)(8) of the Occupational Safety and Health (OSH) Act (29 U.S.C. 651 *et seq.*) requires OSHA to consider national consensus standards, and where the agency decides to depart from the requirements of a national consensus standard, it must explain why the departure better effectuates the purposes of the Act. As OSHA explained when adopting the updated crane rule in 2010, the ASME B30 Standard is a series of voluntary consensus standards that apply to most of the types of equipment, including cranes and derricks, covered by subpart CC as a whole (75 FR 48129-48130). The B30 standards each have chapters that address the operation of

³ William Smith, commenting as a private citizen, presented revisions to 29 CFR 1926.1427(a) by the Coalition for Crane Operator Safety (OSHA-2015-0002-0051). The document recommended revising § 1926.1427(a) by adding provisions that an operator must meet OSHA's qualified person standard and mandating training if an operator cannot safely operate the equipment. In § 1926.1427(b), he recommended removing the language that an operator will be deemed qualified if he or she is certified. Throughout § 1926.1427, he recommended removing references to capacity.

the equipment, which typically include a section on crane operator qualification and crane operator responsibilities (ID-0002, 0003, 0004, 0005, 0006, 0007, 0027, 0028). OSHA considered those provisions in drafting the proposed rule. Similarly, OSHA considered the general requirements of ANSI/American Society of Safety Professionals (ASSP) Z490.1,⁴ which generally addresses the requirements of occupational safety and health training.

An association of occupational safety and health professionals asked OSHA to revise the 2010 crane standard to incorporate by reference the Z490.1 standard and the "soon to be published A10 Standard for Construction and Demolition training" (ID-1824). The commenter specifically requested that OSHA require that "any occupational safety and health training program recognized in the rule must meet the requirements in the ANSI/ASSP Z490.1 Standard and/or the soon to be published A10 Standard for Construction and Demolition Training" (Id.). The commenter also requested that "any training accreditation organization recognized in the proposed rule," and any training curricula, also meet the requirements of those consensus standards (Id.).

OSHA is not incorporating either standard by reference in this rulemaking. First, OSHA cannot legally incorporate by reference a standard that has not yet been published. Second, the training requirements of ANSI/ASSE Z490.1 outline a general training program that is not specific to cranes. After years of interactions with stakeholders, OSHA believes that its revised training requirements will be more relevant to employers of crane operators. Third, given the comprehensive nature of ANSI/ASSE Z490.1, it does not appear to provide the same level of flexibility as OSHA's standard. OSHA developed this final rule with enough flexibility so that employers in the crane industry could adapt existing practices to comply with the standard and ensure safety in a variety of contexts.

The final rule takes many of the underlying concepts regarding operator qualification that are consistent across the B30 standards and ANSI/ASSE Z490.1, and it places them in one standard. This allows employers and crane operators to look to one place for OSHA requirements for operator competence and safety, rather than throughout fourteen relevant B30

⁴ The American Society of Safety Engineers (ASSE) changed the name of the organization to the American Society of Safety Professionals (ASSP).

standards. OSHA's standard re-frames the provisions of those standards as enforceable employer duties, as the OSH Act requires, rather than as employee responsibilities or non-mandatory suggestions.

OSHA believes the revisions in this final rule to the 2010 cranes standard will better effectuate the purposes of the OSH Act than any applicable national consensus standard because the revisions consolidate all crane operator qualification requirements for ease of reference and integrate the permanent operator evaluation and documentation requirements into the standard, along with the existing training requirements and certification requirement, in a manner that OSHA can enforce under the Act.

I. The Need for a Rule

Based on the information collected from stakeholders and the recommendations of ACCSH, OSHA proposed to amend 29 CFR part 1926 subpart CC by revising sections that address crane operator training, certification/licensing, and competency. The purposes of the amendments are to clarify and continue training requirements for operators; to alter the requirement that crane-operator certification be based on equipment "type and capacity," instead permitting certification based on equipment "type" or "type and capacity"; to clarify and continue an employer's duty to evaluate operators and operators-in-training for their ability to safely operate assigned equipment covered by subpart CC; and to require that employers document the evaluation. OSHA is also reorganizing and clarifying the operator certification requirements in § 1926.1427.

Throughout this document OSHA refers to the "previous" or "prior" rule or standard as meaning 29 CFR part 1926 generally, § 1926.1427, or the paragraphs therein, as promulgated in 2010 and revised prior to this rulemaking. Discussion of the "revised" or "amended" standard refers to the amended standard as finalized through this rulemaking.

Employer's Duty To Evaluate Its Operators

In the NPRM for this rulemaking, OSHA proposed a permanent employer duty to evaluate operators that would not expire on the date certification is required. For the reasons discussed below, this final rule revises the prior 2010 crane standard to add that permanent employer evaluation duty. The key difference between this revision and the previous version is that the revision permanently maintains the

employer's duty to evaluate its operators, and provides greater specificity as to what that duty entails in order to provide a clear and enforceable standard.

In the NPRM, OSHA requested comment on making the employer evaluation a permanent requirement in addition to certification. The agency received supportive comments for keeping the employer evaluation requirement in conjunction with certification (ID-0719, 1235, 1611, 1619, 1719, 1735, 1744, 1768). Generally, these comments supported making the employer duty permanent because certification alone is insufficient for an operator to competently operate the crane safely in a variety of workplace conditions, and the employer is in the best position to evaluate an operator's ability to use the specific crane for the specific tasks the employer assigns. As one of these commenters stated, "[t]he intent should be to ensure that operators are fully qualified to be perform their tasks no matter what certifications they may hold and only the employer can ensure that," (ID-0719).

These comments are consistent with the feedback OSHA received from stakeholders prior to publication of the NPRM (ID-0673). In those discussions, most employers stated that they value third-party certification, but do not treat it as sufficient, by itself, to establish competency. Every employer with whom OSHA spoke stated that the employer's role in ensuring the competency of crane operators should be allowed to continue. All of the company representatives stated that they would not let an operator run any of their cranes based solely on his/her possession of an operator's certifications (see e.g. Report #1, 4, 6, 9, 11, 12, 16, 18, 20, 21, 22, 25 of ID-0673). Several industry representatives told OSHA that regardless of what OSHA's crane standard requires, construction and insurance industry influences would prevent many employers of crane operators from relying solely on certification to verify the competence of their crane operators (see e.g. Report #2, 3, 15, 19 of ID-0673). OSHA confirmed from these discussions that, regardless of whether an operator has a certification, all of the employers contacted evaluate their operators to ensure competency (see e.g. Reports #1, 2, 3, 6, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 22, 23, 26, 27, 28 of ID-0673). All stakeholders said it is essential that the operator's employer determine whether the operator is competent to safely operate a crane for a particular construction activity (see e.g. Report #1, 3, 4, 6, 7, 10, 12, 18, 20, 21, 22, 25, 28).

OSHA received no comments on the proposed rule that opposed making the employer duty permanent through an evaluation requirement. The agency received comments recommending revisions to the evaluation requirement. Those comments are addressed below in the discussion of Paragraph (f)—Evaluation.

Under the 2010 crane standard, the employer duty to ensure operator competence (§ 1926.1427(k)(2)(i)) ends in November 2018, after which operator certification would be the only required way to assess operator safety qualification. There were no other requirements for operator safety qualifications beyond certification after that date. Under the revised standard, the employer's evaluation is established as a critical element to ensure safe equipment operations on construction worksites. Third-party certification is portable so that operators do not need to be re-certified just because they switch employers; employers can rely on previous training the operator has received from other employers (or labor organizations) because the revised standard requires that every employer evaluate an employee first as an operator-in-training before permitting him or her to operate equipment without oversight. The evaluation process is performance-oriented and discussed in more detail in the explanation for revised § 1926.1427(f).

During its testimony in support of retaining an employer duty to assess operators, the International Union of Operating Engineers (IUOE) stated that removal of that duty would endanger operators and workers in the vicinity of cranes, "[c]rane operators would be in a far worse position than they were before issuance of the final rule in August 2010" (ID-0486). William Smith of Nations Builders Insurance Services (NCCCO board member and C-DAC member) agreed, commenting that "[l]eaving the rule as written [with certification but without a continued employer duty after the initial deadline of November, 2014] would take us back in time not forward in protecting lives" (ID-0474). A U.S. crane manufacturer stated that the lack of employer evaluation of an operator would be a problem, and certification is a foundation, but should not be a substitute for an employer competency evaluation. (Report #4 of ID-0673).

An employer's evaluation assesses different operator skills than certification tests. The reports from stakeholders prior to publication of the proposed rule showed that most stakeholders viewed certification only as a verification of an operator's basic

operating skills and crane knowledge such as reading load charts, recognizing basic crane hazards, inspecting the equipment, knowledge of applicable regulations, and familiarity with basic crane functions to control the boom and load line (ID-0673). The rulemaking record includes a list of activities from the IUOE that require specific skills that are not evaluated during the certification practical exam, but can be covered during an employer evaluation. These activities include inspecting the equipment; assessing unstable loads; hoisting loads of irregular size; operation from a barge; personnel hoisting; rigging the load; leveling the crane; hoisting in tight spaces where there is greater opportunity for damaging parts of the crane other than the load line; making judgments about wind speed and other environmental factors that can impact the performance of the equipment; performing multiple crane lifts; traveling with or without a load; operating near power lines; hoisting light loads; and hoisting blind picks where the operator cannot see the load (*see, e.g., Docket ID-0527, p. 3*). IUOE has also noted that different skills are required to operate equipment with different attachments and identified in particular the unique skills required to operate with clam bucket or drag line attachments (Id.). By way of contrast, the IUOE stated that the operator certification practical test covers only basic operation functions (hoisting and lowering a load and guiding it through a course), and "does not test on the breadth of activities that are involved in the operation of cranes" (Id.). Local 49 of the IUOE added: "It is understood in the industry that it is not economically feasible to simulate on a training site all scenarios that arise on a construction site and that training and evaluations of training must occur on an ongoing basis" (ID-1719). Without the employer duty to evaluate operators on the equipment to which they are assigned, an employer could permit a certified operator to operate tower cranes and other large equipment in any configuration with any number of attachments without determining if the operator possesses the requisite knowledge and skills necessary to ensure safety and address the issues identified by IUOE and others.

Some employers described certification as a "learner's permit" (ID-0539, Reports #15, 26 of ID-0673), and a number of employers with whom OSHA spoke stated that they would not allow a certified operator to use their equipment without first also evaluating the operator to verify competence

(Reports #1, 6, 18, 20, 22 of ID-0673). The Executive Director of the IUOE's certification program stated that he does "not know any contractors . . . at least the union contractors that we're associated with, who fail to make sure that their people are qualified" (OSHA-2015-0002-0036). A trade association commented that "[t]he record makes clear . . . that the fact that an employee has been certified as competent to operate a crane does not mean that the employee is qualified to operate the employer's particular equipment" (ID-1768). A training company representative stated that operators with very little experience can acquire a sufficient basis of knowledge of the crane to pass a certification exam without being truly qualified to operate independently and safely on a construction worksite (Report #21 of ID-0673). Two stakeholders expressed concern that relying solely on certification could be dangerous because it would create a false sense of qualification, leading some contractors to be less vigilant in evaluating the competence of operators to safely operate equipment for all of their tasks (Reports #9, 11 of ID-0673).

In addition to the commenters identified earlier as supporting an evaluation requirement, OSHA had already heard from many stakeholders that the employer should play a direct role in ensuring that their operators are competent (ID-0539, Reports #1, 2, 3, 4, 6, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 21, 22, 25, 26 of ID-0673). A commenter asserted that extending the employer duty is "logical" because the employer should "have the ability to make an evaluation of an operator's ability to operate equipment in a safe and responsible manner" (ID-1779). One commenter stated many of its members believe "certification itself is not sufficient to establishing crane operator competency, and believe that employers must initially evaluate and continue to re-evaluate their crane operators to determine their ability to safely operate a crane" (ID-1735). Because a standardized test cannot replicate all of the conditions that operators must safely navigate on the jobsite, the employer is typically in a better position than a certifying organization to fully evaluate an operator to ensure that he or she has the skills, knowledge, and ability to recognize and avert risks required for a particular assignment on a particular crane. Just as an employee's driver's license would not guarantee the employee's ability to drive all vehicles safely in all conditions an employer may require, crane operator certification

alone does not ensure that an operator has sufficient knowledge and skill to safely use equipment.

Many stakeholders indicated that in their experience operator competency needed to be crane-specific (Reports #1, 2, 3, 4, 6, 16, 19, 21 of ID-0673). A comment to the proposed rule supporting a permanent employer duty stated "employers have a duty to evaluate all crane operators to ensure that they are qualified to perform the assigned work on the type and model used" (ID-1719). Similarly, a certification body believes that "[i]t's always been the employer's duty to qualify an operator for the specific crane and task" (ID-1235). Some of the stakeholders raised concerns about the importance of these different crane characteristics in discussing whether OSHA should require certification to be by type and capacity or just by type. For example, one employer told OSHA that certification could be by type alone, provided the employer was responsible for evaluating operator competency on assigned equipment (Report #1 of ID-0673). A crane operator training company that OSHA interviewed noted that no one certification test could ever capture all of the types, configurations, and capacities of cranes and the activities they may be used to perform at the jobsite. Therefore, it is important that the employer typically verify the operator's skill level through an experienced assessor (Report #20 of ID-0673).

As OSHA noted in the NPRM, an extensive analysis of crane accidents published by HAAG Engineering in 2014 concluded that crane incidents are more likely to be reduced if a company ensures that an operator possesses equipment-specific skills and knowledge in addition to certification:

The certification process ensures that an operator has demonstrated a core knowledge set of the principles of cranes and crane operations, OSHA regulations, and ASME standards requirements . . . has successfully demonstrated both knowledge and the physical skill set to operate a type of crane.

Comparing responsibility failure trends between crane types gives strong evidence that crane model-specific training is an overwhelmingly good idea. . . . In order for the industry to theoretically provide a quality certification for each model crane, the process would take decades just to develop certifications for existing model cranes, and with new models coming out every year, that development process would also be never-ending. Each time a new model crane was released, its use would be prohibited until a qualified certification process was developed if model-specific certification was required. Model specific qualification is an issue that cannot and should not be done by the

certification process, but should be done through training and examination by the individual company and corresponding operator in addition to earning type-specific certifications which ensure the knowledge and skill sets discussed above.

Understanding of crane principles, general crane characteristics, individual responsibilities, and national standard guidelines is the basis for certification; however, an operator's familiarity with the particular unit is invaluable in the goal to reduce operator associated incidents.⁵

(83 FR 23541). No commenters challenged this assessment of the significance of equipment-specific evaluations.

The evaluation requirement is a mechanism to help ensure that operators possess the skill to account for and safely use the variations within even a single type of crane; without the evaluation requirement there would be no distinction between the competency required to operate the same type that has differing controls. It is OSHA's intent with the revised standard, including the evaluation, to avoid accidents such as the *Deep South* collapse, in which an operator was assigned to a crane of a type for which he was certified, but the controls and operations were significantly different from those with which he was familiar. Operator error factored into the collapse of the crane, killing four people. The reviewing court upheld the Occupational Safety and Health Review Commission's finding that the operator was not qualified to operate that crane. The Commission noted that the crane that collapsed was "significantly different" from the cranes that the operator had previously operated and that the operator had not had previous experience with the crane in a similar configuration (see *Deep S. Crane & Rigging Co.*, 23 BNA OSHC 2099 (No. 09-0240, 2012), *aff'd Deep S. Crane & Rigging Co. v. Harris*, 535 F. App'x 386, 390 (5th Cir. 2013)).

The evaluation requirement is also necessary to ensure safety as the crane industry moves away from traditional training models. A crane insurance representative stated that the industry is moving away from assigning two employees to work on a crane, where the less experienced employee is mentored by the other, to where only one person is assigned to work on a crane, and expressed concern that this shift may impact the availability of sufficiently qualified operators and the safety of the industry (Report #25 of ID-

0673). Such an approach increases the importance of an employer evaluation requirement because informal monitoring would be less frequent. Requiring certification by crane type or type and capacity, and retaining the employer duty to evaluate operators should help to ensure that crane operators have sufficient training to maintain safety when two employees are no longer assigned to work on a crane. The previous certification requirement ensures baseline knowledge and skills to operate a crane, while retaining the employer duty to evaluate operators provides some assurance that the operator can safely handle the specifics of operating particular equipment and performing more challenging tasks in a variety of contexts.

The only concerns that commenters on the proposed rule expressed about the evaluation requirement focused on the specifics of the requirement, not the proposition that an employer should have a duty to ensure operator competency. OSHA discusses the specific requirements of the evaluation more fully in the preamble explanation of revised § 1926.1427(f). It is also important to note that OSHA is not creating a totally new duty. All employers were required to assess their operators prior to the 2010 crane rulemaking, continued to have such a duty under the previous § 1926.1427(k), and none of the commenters raised any hardships caused by an employer duty to assess operators. To promote consistency and effectiveness and ensure safety, this rulemaking simply clarifies what that evaluation involves and makes the duty permanent.

OSHA requested comment on whether there are more effective ways of ensuring that operators are fully qualified to use cranes for the specific activities that they will be required to complete. Specifically, OSHA asked whether "independent third-party evaluations" should be required (83 FR 23542). One commenter responded, opposing such a requirement on the grounds that third-party evaluators might not be commercially available and, even if available, would not be more effective than evaluations conducted by the operator's employer (ID-1615).

A different commenter suggested that OSHA should implement an "operator training program such as an oiler was in the past" so that "the training is complemented with knowledge of the machine he will be operating . . . seat time will give knowledge of the load charts to understand the difference between structural, tipping capacity's

[sic] from a trained operator" (ID-698). OSHA envisions the revised rule functioning in a flexible manner that will lead to the results the commenter describes: A combination of training and experiential learning that ensures that the operator can safely operate the equipment to which he or she is assigned.

OSHA considered several alternative approaches to the provisions in paragraph (f) adopted through this rulemaking, but concluded that those alternatives would not be as effective as the adopted measures in ensuring crane operator competency and safety. The first approach was to remove the phase-out of the employer duty without providing further guidance or criteria. As discussed later in the preamble section for paragraph (f), OSHA believes that evaluations of operator competency are critical to safe crane operations and that proposing a general requirement for this purpose, without providing additional criteria, would be inadequate.

The second approach considered was adopting the ACCSH recommendation to use the Coalition for Crane Operator Safety's language requiring employers to ensure that operators "meet the definition of a qualified person" before operating the equipment. As explained later in the preamble discussion of paragraph (f), OSHA is adopting a compromise version of this regulatory text as proposed by a commenter. OSHA is concerned that the ACCSH recommendation, like the general duty under § 1926.21(b)(4), fails to provide sufficient specifics to ensure operator competence. Moreover, the ability to "resolve problems," which is a key component in the definition of a "qualified person," only captures one aspect of what safe crane operation entails. And by relying on the definition of a "qualified person," which can be met in some cases solely through "possession of a . . . certificate," the whole point of having some additional assurance of operator competency beyond operator certification would be lost: An operator could still conceivably become both certified *and* a qualified person through the completion of a single certification test. For these reasons, OSHA believes that this final rule better establishes the employer's obligation to ensure crane operator competency.

In the third approach, OSHA explored the practicality of modeling a crane operator evaluation process on one implemented in the provinces of Canada. In those provinces, a quasi-governmental agency tracks the base level of certification and operating

⁵ Wiethron, Jim D., *Crane Accidents: A Study of Causes & Trends to Create a Safer Work Environment*, 1983-2013, pp. 105-106 (HAAG Engineering, 2014)

experiences of the operators in an internet database. For example, the British Columbia system has at least three different levels of "qualification," and employers are responsible for observing, evaluating, and ensuring the operators are competent to perform the work required at each level (ID-0672). OSHA concluded, however, that this level of oversight would be impractical on a national scale in the United States. The expertise needed to develop and maintain a system that works for the entire regulated community across the United States, and to verify the information in such a system, would be substantial. Moreover, even after providing certification for its operators, employers in Canada still have the obligation to ensure the competency of operators to safely perform assigned work, which is similar to the operator evaluation requirements of this final rule.

Based on all of the reasons in the foregoing discussion, OSHA concludes that it will improve crane safety to continue and make permanent the requirement for employers to evaluate their operators and operators-in-training in addition to ensuring that they are properly certified. Employer evaluation increases safety by focusing on specific knowledge and skills that operators need for the safe use of particular equipment for particular tasks in a variety of contexts. The specific evaluation requirements are set out in paragraph § 1926.1427(f) and are explained later in this document in the preamble discussion of that paragraph.

Elimination of the Requirement To Certify Based on Capacity of Crane

As discussed above, OSHA proposed altering the requirement for different certifications based on different lifting capacities of equipment after receiving feedback that the capacity requirement does not provide a significant safety benefit because the lifting capacity of the equipment is not a meaningful component of operator certification testing. In its request for comments on this issue, the agency specifically asked for information that demonstrated the safety benefits of certification by capacity.

OSHA received one comment claiming that "[r]etaining capacity will require more stringent testing resulting in an increase in crane safety, thus fewer accidents," (ID-1235), but this commenter did not provide any evidence of how certification by capacity increases safety or reduces accidents. OSHA received a comment from an association stating that its members were split on this issue, but

the association did not share why some of its members opposed the removal of capacity (ID-1824). Another association commented that it "concur[s] with the proposed rule" and suggested that it would be "better than the current rule," but the rest of its comment on this point was not clear (ID-1632). Without further explanation, that commenter added that it supported certification organizations having a choice and "believes it would be best for the safety of crane operations to certify by type and capacity" (Id.). However, the commenter did not offer any information about the safety benefits of certification by capacity.

While testing organizations differed over whether a certification by capacity provided any useful information to an employer, most commenters agreed that capacity is just one factor to be considered in the employer's overall evaluation of the operator's ability. The majority of commenters that responded to this issue support removing the certification by capacity requirement (ID-0690, 0703, 0719, 1611, 1616, 1619, 1628, 1632, 1719, 1735, 1744, 1755, 1764, 1768, 1801, 1816, 1826, 1828). A certification body commented that "virtually unanimity exists in the industry that certification by 'capacity' should be eliminated from the regulatory requirement" (ID-1816). Another certification body echoed that point, stating that "The industry has been clear in its comments that, whereas equipment 'type' is critical when delineating knowledge and skill, equipment 'capacity' is just one of many other factors (like configuration) to be considered in the employer's overall evaluation of an operator's ability" (ID-1755).

The majority of comments responding to this request did not know of any safety benefits related to certification by capacity (ID-1615, 1628, 1755, 1768). One comment claimed that capacity "did very little to advance the safe operation of cranes at construction jobsites" (ID-1619). Two certification bodies that offer certification by capacity did not offer any safety evidence to the agency in public hearings or stakeholder meetings (ID-1719). Referring to consensus standards and industry best practices, one commenter noted that ASME B30.5 "does not describe testing or examination by capacity," and the organization "is not aware of any state or local regulatory body . . . that requires certification or licensing by both type and capacity" (ID-1816).

In addition to many commenters stating that certification by capacity has no demonstrable safety benefit, many also consider the requirement to be

burdensome (ID-0616, 0690, 0703, 0719, 1619). One of these commenters stated that they paid for their operator to be certified, but the operator only passed the test for cranes up to a capacity of 21 tons and was forced to also take an entirely different exam for cranes up to 75 tons in order to operate a crane of 23 tons, just over the capacity limit of the lower test (ID-0616). A different commenter concluded that some of their members find the capacity requirement "unwieldy and exceptionally burdensome" (ID-1824). One commenter explained that if the OSHA capacity requirement went into effect, "approximately 83% of those possessing certification" would not be compliant with the 2010 cranes standard (ID-1801).

One commenter believes "[t]he industry has been clear . . . 'capacity' is just one of many other factors (like configuration) to be considered in the employer's overall evaluation of an operator's ability" (ID-1755). One commenter agreed with OSHA that the employer evaluation was the appropriate time to consider the crane's capacity among other factors (see discussion of § 1926.1427(f)(1) later in this document) (ID-1735).

Based on this record and the continued employer duty to evaluate operators, which provides an additional means for ensuring that the operator can safely use equipment for the range of tasks assigned, OSHA has determined that employee certification by capacity of crane should no longer be required; rather, it may be an option for those employers who wish to use it. Employers can comply with the third-party certification requirements of OSHA's crane standard by ensuring that their operators are certified by an accredited organization by type of crane or, alternatively, by both type of crane and by capacity.

J. Significant Risk

Section 3(8) of the OSH Act requires that OSHA standards be "reasonably necessary or appropriate to provide safe or healthful employment" (29 U.S.C. 652(8)), which the Supreme Court has interpreted as requiring OSHA to show that "significant risks are present and can be eliminated or lessened by a change in practices" (*Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 642 (1980) (plurality opinion) ("*Benzene*"). The Court clarified that OSHA has considerable latitude in defining significant risk and in determining the significance of any particular risk, noting that "[i]t is the Agency's responsibility to determine, in the first instance, what it considers to be

a 'significant' risk" (*Benzene*, 448 U.S. at 655).

Although OSHA makes significant risk findings for both health and safety standards, the methodology used to evaluate risk in safety rulemakings is more straightforward. Unlike the risks related to health hazards, which "may not be evident until a worker has been exposed for long periods of time to particular substances," the risks associated with safety hazards such as crane tipovers, electrocution, and striking or crushing workers with a hoisted load, "are generally immediate and obvious." *Benzene*, 448 U.S. at 649, n.54. The final rule for OSHA's 2010 cranes standard contained an extensive analysis in which the agency examined fatality and injury data available in 2008 and concluded that employees working in or around cranes and derricks face a significant risk of death or serious injury (see 75 FR 48093).

When, as here, OSHA has previously determined that its standard substantially reduces a significant risk, it is unnecessary for the agency to make additional findings on risk for every provision of that standard (see, e.g., *Public Citizen Health Research Group v. Tyson*, 796 F.2d 1479, 1502 n.16 (DC Cir. 1986) (rejecting the argument that OSHA must "find that each and every aspect of its standard eliminates a significant risk"). Rather, once OSHA makes a general significant risk finding in support of a standard, the next question is whether a particular requirement is reasonably related to the purpose of the standard as a whole. (*Asbestos Information Ass'n/N. Am. v. Reich*, 117 F.3d 891, 894 (5th Cir. 1997); *Forging Indus. Ass'n v. Secretary of Labor*, 773 F.2d 1436, 1447 (4th Cir. 1985); *United Steelworkers of Am., AFL-CIO-CLC v. Marshall*, 647 F.2d 1189, 1237-38 (DC Cir. 1980)).

As explained elsewhere in this preamble, this final rule meets this test. OSHA previously concluded that the 2010 crane standard would substantially reduce risk through a combination of mandatory operator certification and other requirements, but OSHA did not claim that the standard would eliminate the significant risk entirely. The employer evaluation is reasonably related to the reduction of significant risk because it reduces employee exposure to the previously identified hazards. It reflects current industry best practices and helps to ensure the employee has the skills and knowledge to operate the crane safely during the lifts to which he or she is assigned.⁶

⁶ The removal of the requirement for certification by crane lifting capacity is not implicated in this

The agency notes that there is ample evidence in the record that workers could continue to be exposed to the hazards that OSHA sought to reduce through the 2010 cranes standard. OSHA relied on fatality data available in 2008 when it promulgated the crane standard, but unfortunately crane-related fatalities have continued to occur. According to the Census of Fatal Occupational Injuries, 47 crane operators were killed between 2011 and 2014 (this does not include accidents with non-fatal injuries or crane incidents causing fatalities or injuries to workers other than the crane operator).⁷

Another useful data source is a report by an engineering forensics firm, HAAG Engineering, of a large dataset of crane accidents that it has investigated over a period of 30 years (Wiethorn, 2014, the "HAAG Report") (ID-0674). The final dataset has 507 incidents, covering all types of cranes and accidents. This dataset is likely biased towards larger accidents since these are more likely to warrant significant investigation for insurance and litigation issues. But while it is not a representative sample of all crane accidents, it is a large sample and may be suggestive of more general trends. The HAAG report states that of 141 employee fatalities among its reported crane incidents, 28 were operators, meaning there were approximately 4 times more non-operator employees killed than operators from crane accidents in this sample ((141-28)/28=4.03).⁸ Similarly for injuries, out of 267 employee injuries, 29 were to operators, so that there were 8.2 non-operator injuries for every operator injury ((267-29)/29=8.2).⁹ These two categories are not mutually exclusive (there are often injuries when there is a fatality).

As noted in more detail in the "Benefits" section of the Final Economic Analysis for this rule, three recent fatalities in particular illustrate the dangers from improper equipment operation that could be prevented by the evaluations included in this amendment to the standard. In one instance, the crane operator was not familiar with the controls of the equipment. In another incident, an operator hoisting pipes longer than he had previously hoisted used an improper boom angle, indicating that he did not possess

significant risk discussion because it removes a requirement and does not impose any new duties.

⁷ Bureau of Labor Statistics, *Census of Fatal Occupational Injuries (2011 forward)*, Fatalities to Crane and Tower Operators, series ID FWU50X53702X8PN00, available at <http://www.bls.gov/iif/data.htm>.

⁸ The HAAG report, p. 31.

⁹ Id.

adequate knowledge and skills to address the additional challenges of the task he was required to perform. In the third incident, a fatality occurred when an employee operated a new, unfamiliar machine with controls in different locations than the machines with which the operator was accustomed. While the employee's use of that equipment arose from unexpected circumstances, the result nonetheless demonstrates the risk inherent with operating a crane without a method to ensure the operator knows how to operate new equipment where there are differences in control locations and functions.

None of the commenters disagreed that OSHA does not need to make a separate determination of significant risk, nor did anyone challenge the relevance of any of the fatalities noted by OSHA. As explained in the "Background" and "Need for Rulemaking" sections of the preamble, commenters have raised serious concerns that the current level of risk would increase if OSHA did not continue the employer duty to ensure operator competency on the actual equipment they operate. The nearly unanimous message to OSHA is that crane operator certification is designed to ensure a basic level of general operating competency, but is not by itself sufficient to ensure that operators have the necessary skills and knowledge to operate all assigned equipment or to perform all assigned tasks safely in all workplace conditions.

III. Summary and Explanation of the Amendments to Subpart CC

Discussion of the Final Rule's Organization and General Terms Used in Its Summary and Explanation

The following discussion summarizes and explains each new or revised provision in this final rule and the substantive differences between the revised and previous versions of OSHA's crane operator requirements in subpart CC of 29 CFR part 1926. As a general matter, OSHA has reorganized this section of the rule to improve comprehension of the requirements. In the "Background" section of this notice, OSHA summarizes the rationale for making permanent the employer duty to evaluate operators and removing the requirement for certification by equipment capacity.

Paragraph (a)—Duty To Train, Certify or License, and Evaluate Operators

Paragraph (a) sets out the employer's responsibility to ensure that each operator completes three steps before the employer permits the operator to

operate equipment covered by subpart CC without continuous supervision. In the regulatory text, OSHA refers to this entire three-step process as "qualification." Each operator must be trained to do the crane activities that will be performed, be certified/licensed in accordance with subpart CC, and be evaluated on his or her competence to safely operate the equipment that will be used. In addition, paragraph (a) sets out exceptions to these requirements for certain equipment, as well as continuing to note that qualifications issued by the U.S. Military to its non-uniformed employees satisfy OSHA's crane standard (OSHA continues to apply the term "qualification" within the final rule for operators working for the U.S. military, as it did in the previous version of the rule). The new approach provides a clearer structure than the previous format of the standard, which was not designed to accommodate both certification and evaluation.

In addition, the final rule makes clear that post-certification training is required. OSHA adopted this change because the previous version of the standard focused on pre-certification training. The final rule outlines the ongoing training necessary for certified operators to learn to operate new equipment or perform new tasks. The new final rule contemplates operators still needing additional training after they are certified, such as training to operate a new type of crane, perform new tasks, or handle new controls in a crane that differ from previous models they have operated. The employer is obligated to train employees, as necessary, even after they are certified, until the employer has evaluated them in accordance with paragraph (f). The training components are otherwise nearly the same under both the previous and revised versions of the standard.

As under the previous version of the standard, (see prior § 1926.1430(g)(2)), refresher training would also be required when indicated by deficiencies in the employee's demonstrations of crane knowledge or equipment operation.

The current certification/licensing requirement, which is the centerpiece of the previous operator requirements, remains largely unchanged under the revised standard, with the exception that different certifications for different capacities of cranes would no longer be required. The reference to "certified/licensed" is intended to encompass each of the certification options in the standard (third-party certification or an audited employer certification program) as well as state or local operator licensing requirements.

Several commenters requested that OSHA remove the existing requirement for operator certification from the standard (see, e.g., ID-1605, 1615, 1821, 1826). These commenters faulted OSHA for failing to re-justify the requirement for operator certification or did not think it should be applied to their specific industry.

However, operator certification was central to the 2010 final rule, which was based on the industry stakeholder recommendations through a negotiated rulemaking. Comment was requested on the proposal in that rulemaking, and OSHA held several days of hearings on the proposal. OSHA published the rationale and justification for the inclusion of the certification requirement in the standard in the 2010 preamble, and so there was no need to re-explain the agency's lengthy analysis in this new rulemaking. In the NPRM for this rulemaking OSHA did not signal that it was considering removing certification: To the contrary, one of the main purposes of the rulemaking was to implement a change to the certification requirement (removing capacity) in recognition of the limited safety benefits of that requirement. This would reduce needless regulatory burden and ensure that the employers of a majority of operators would be able to comply with the certification requirement. OSHA also proposed to clarify and make permanent other employer evaluation duties, but those were proposed *in addition to* the operator certification requirements and the proposal re-organized the standard to encompass both.

With certification already a requirement of the standard, the main issue in this rulemaking besides the content of the certificate was the additional employer evaluation requirement. One commenter claimed that OSHA's "policy shift" to include additional employer evaluation duties in the current rulemaking "demonstrates that even it does not believe that certification is necessary to verify basic crane operating skills and knowledge needed to safely operate the equipment" (ID-1605, p. 2). OSHA disagrees. OSHA accepted the construction industry stakeholders' recommendation for a third-party certification requirement in 2010 after OSHA's previous construction cranes standard, which included a generic duty for employers to assess operators but no independent certification of the operator's knowledge or abilities, appeared ineffective in reducing fatalities and injuries caused by crane operator errors. OSHA proposed the employer evaluation in this current

rulemaking as an *addition to* certification, not as an *alternative to* certification, because those provisions are intended to work in tandem as explained in more detail elsewhere in this preamble. The certification provides an independent assessment of general baseline knowledge and skill and the employer evaluation focuses on specific knowledge and skills needed for the safe operation of particular equipment for particular tasks.

OSHA also disagrees with the claim that adoption of a permanent requirement for employer evaluation of operators undercuts the need for certification (see also ID-1821). Many of the industry stakeholders who participated on the negotiated rulemaking committee (C-DAC) who recommended independent operator certification saw a need to verify baseline crane operating knowledge and skills, and OSHA incorporated that recommended requirement into its standard after public comment and extensive analysis, as explained at length in its 2010 final rule and accompanying preamble (75 FR 47905). But following that rulemaking, industry stakeholders noted a distinction between the basic operating knowledge and skill needed to pass a certification examination, on the one hand, and on the other the knowledge and skill needed to safely operate specific equipment to complete a specific task on a construction site. Employers had traditionally addressed this distinction when complying with OSHA's general construction requirement in § 1926.20(b)(4) ("The employer shall permit only those employees qualified by training or experience to operate equipment and machinery"). But the inclusion of specific operator training and certification requirements in the 2010 standard supplanted that general requirement, apparently to the surprise of some former C-DAC members, who then began advocating for a replacement (see e.g. ID-0539). With additional information from industry, the agency has taken action through this rulemaking to prevent individuals from performing construction work using even the types of machinery for which they are certified until employers confirm that they are sufficiently familiar with the particular machines they will operate and the specific tasks they will perform in order to ensure safety.¹⁰

¹⁰ The employer evaluation requirements should also allay stakeholder concerns about the removal of the requirement for certification by different crane capacities, which OSHA had previously incorporated as a means of addressing significant

OSHA also disagrees with the assertion that OSHA had previously stated that certification would, by itself, eliminate unqualified operators, and that OSHA further stated that the “intent of certification . . . was clear all along: The test would demonstrate the operator’s technical knowledge specific to the equipment—meaning certification equated to qualification” (ID–1605). In support of the claim, the commenter selectively quoted language in the regulatory text in previous § 1926.1427(b)(2) that operators would be “deemed qualified” to operate equipment once certified. However, OSHA used “deemed” in the description “deemed qualified” in the previous § 1926.1427(b)(2), as well as separate references to certification and qualification as alternatives, to avoid the impression that certification resulted in a fully qualified operator.¹¹ As OSHA previously explained in the NPRM, OSHA only used the term “deemed qualified” to recognize under a single rubric the full spectrum of options for complying with OSHA’s standard: Certification, military authorization, state-licensing, and “qualification by an audited employer program.” (See 83 FR 23549, n. 10.)

Many commenters requested exemptions from the operator certification requirements or the entire rule. These comments, which included several mass mailings of identical or nearly identical comments, focused on exemptions for the use of cranes in three industries: Delivery and installation of propane tanks; using equipment attached to scaffolding to hoist loads up to the scaffolding; and using equipment to install signs (see, e.g., ID–1184, 1631, 1830).¹² OSHA noted in the proposed

differences between machinery within a single type of crane.

¹¹ In providing an overview of the function of the requirements of section 1427, OSHA used the terms “certification” and “qualification” separately in describing the process for compliance: “In the final rule, paragraph (a) of this section specifies that the employer must ensure that the operator . . . is either qualified or certified to operate the equipment in accordance with the provisions of this section. . . .” Also, in describing the alternative permitted under 1427(b), OSHA stated in the 2010 final rule: “As noted above, the proposed rule provided four options for a crane operator to be qualified or certified.” 75 FR 48017.

¹² One commenter from the pre-cast concrete industry requested an exemption from the certification requirements for operators of knuckleboom cranes, noting that these cranes “are present in a large number of precast concrete plants” (ID–1047). The commenter continued that “[a]dding a national certification requirement for knuckle-boom cranes would not likely have an impact on improving safety within the plant. . . . This assessment is backed by data from the Bureau of Labor and Statistics, which identifies general industry, of which the precast concrete industry is a part, as accounting for a significantly lower rate

rule that broad requests for exemptions from existing requirements were beyond the scope of this rulemaking, but requested comment on whether there should be exemptions from the revised *employer evaluation* requirements (83 FR 23544). Thus, exemptions from the revised employer evaluation requirements were the only exemptions OSHA proposed in the NPRM.

To the extent that commenters from these industries addressed employer evaluations of operators, they suggested that they were already performing the types of evaluations that would be required by the revised standard.¹³

of workplace accidents involving cranes than the private construction industry.” The commenter described the burden on “these small manufacturers” and also stated: “While some precast concrete plants have crane operators who would need to be certified on other classes of cranes, there are likely thousands of plant personnel who operate only a knuckle-boom style of crane.” Taken together, the references to the employers as manufacturers engaged in general industry work, the use of the cranes in “the plant,” and their presence in a “large number of . . . plants,” the commenter seems to misinterpret OSHA’s construction crane rule as applicable to that industry’s general industry activities. The operator certification requirement only applies when equipment is used for construction work, not for the manufacture of pre-cast concrete in a manufacturing plant. A different commenter (ID–1190) also requested an exemption for “pre-cast concrete manufacturers” and referred to “drivers” requiring certification. OSHA has previously clarified that manufacturers who simply deliver their products to the ground on a construction site are not considered to have engaged in construction activity, so the drivers in that scenario would not require certification under OSHA’s construction crane standard.

A different commenter, without identifying his industry, asked for an exemption for “small truck mounted booms” under the theory that employers, rather than pay for operators to be certified, would simply “eliminate these valuable tools that will ultimately lead to more back injuries because proper tools are not available to the employee” (ID–1373). OSHA notes that its standard already exempts from the certification requirement operators of “equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less” (revised 29 CFR 1926.1427(a)(2)).

A third commenter noted his opposition to operator certification because “I believe that there are only three entities that are recognized for this outside of the Operating Engineers for union shops. OSHA . . . must provide a clear process for employers to seek accreditation that is independent of the currently accredited entities” (ID–0704). OSHA’s standard does not restrict the number of third-party certifying entities or their accrediting bodies. OSHA’s standard also allows individual employers to comply with the certification requirement by certifying their own employees through a program audited by a third-party (see revised 29 CFR 1926.1427(e)).

¹³ For example, a representative of the propane industry explained that “experienced propane field technicians provide hands-on training to new employees in coordination with or subsequent to review of written training materials” (ID–1631). Their industry also “utilizes competency training materials that provide training on the use of cranes to deliver and retrieve a propane container,” and “utilizes the crane training materials along with

Indeed, despite the fact that employers in these industries have been required to perform some sort of operator assessment for the last eight years under § 1926.1427(k), they provided no examples of hardship or obstacles that have arisen during these assessments that would indicate that the new evaluation requirements would also pose an undue burden. OSHA is therefore not persuaded that employers in these industries should be exempt from the requirement to evaluate operators. Other than for operators of sideboom cranes, derricks, or equipment with a lifting capacity of less than two tons, the evaluation requirements in the new standard apply to all operators.¹⁴

The third element in the introductory text of revised paragraph (a) refers to the employer’s duty to assess the operator to ensure that an operator has the skills, knowledge, and ability to recognize and avert risks to operate equipment safely. The updated duty to evaluate operators is similar to the duty in the prior version of the standard at § 1926.1427(k)(2)(i), which specified that employers must ensure that operators are able to operate equipment safely. That employer duty in the 2010 crane standard was scheduled to be phased out once the operator certification requirements become effective on November 10, 2018. In the final rule, OSHA is permanently retaining an employer assessment duty but has re-located it to paragraph (a) to increase comprehension of the standard’s requirements. The revised standard also includes requirements for the individual who performs the evaluation and requirements for

other industry-developed training materials to provide new training before an employee is assigned a new responsibility as well as at regular intervals to serve as refresher training” (ID–1631). A representative of the precast concrete industry explained that their organization’s “engineers have visited hundreds of plants and have observed . . . owners ensuring operators competency” (ID–1047). The rationale for the employer evaluation seems equally applicable to these industries and the commenters do not provide any persuasive evidence disputing that it is important that employers evaluate operators to assess whether they have the knowledge and skills to safely operate the equipment which they are assigned to use to perform construction tasks.

¹⁴ One of the same group of commenters also suggested, if removal of certification is not an option, that OSHA consider allowing “one certification based on function,” such as a single certification for operators of propane delivery cranes (as opposed to a certification for each type of crane) (ID–1631). A different commenter requested that OSHA remove the existing exemption from the certification requirements for cranes with a lifting capacity lower than 2,000 pounds (§ 1926.1427(a)(3)), asserting that those smaller cranes can also pose safety hazards (ID–1475). Neither of these requests address any of the changes proposed in the NPRM and are therefore outside the scope of the rulemaking.

documenting the evaluation. It retains the previous duty for employers to re-evaluate operators when necessary (see previous § 1926.1430(g)(2)), but moves the requirement to the evaluation section to improve comprehension of the requirements (see full discussion of revised paragraph (f)—*Evaluation* below.)

Paragraphs (a)(1) to (3) provide limited exceptions to the general requirement in paragraph (a) that operators must be trained, certified, and evaluated before operating equipment.

Paragraph (a)(1) permits an employee to operate equipment as an “operator-in-training” prior to being certified and evaluated, provided that he or she is supervised and operates the equipment in accordance with the training requirements in paragraph (b). This is the only means by which an individual may operate equipment prior to being trained, certified, and evaluated as competent to do so. This exception is substantively similar to the provision in the previous crane standard at § 1926.1427(a), which permitted uncertified operators to operate equipment only when the employer complied with the requirements specified under previous § 1926.1427(f)—*Pre-qualification/certification training period*. The revised standard also permits certified/licensed operators to operate equipment as operators-in-training before successfully completing an evaluation. For example, this provision allows experienced and certified operators to become accustomed to performing new crane operations or operating somewhat different equipment while being evaluated by the employer for that purpose. It also allows a newly hired operator to run the equipment while a new employer gauges the operator’s crane knowledge, operating skills, and training needs. In addition, experienced operators who are not certified may operate the equipment when all operator-in-training requirements are met.

The standard recognizes that on-the-job training is an important component of gaining the practical operating experience necessary to safely operate a crane and to pass a competency evaluation. Other employers agreed that, depending on a number of factors, determining the competency of a new, inexperienced operator to become an independent, safe, and efficient operator is a process that can vary in time depending in part on having a crane available and demand for the crane services (e.g., Reports # 2, 11 of ID-0673). This competency process is often informal and integrated in day-to-day

work, with operators-in-training working closely with experienced operators in on-the-job training who mentor them and show them how to use equipment (Reports # 1, 2, 3, 6, 11, 15, 16, 18, 19, 23 of ID-0673). Operators receive experience not only in the cab, but also in many tasks or operations related to hoisting, such as rigging, assembly/disassembly or set-up, or inspections. Moreover, many employers who train new operators require them to complete operator certification at the beginning, or in the middle of, their training program, while employer evaluation of competency is generally a later step in the process and may occur many times over an operator’s career. Therefore, OSHA believes that permitting an operator-in-training to operate equipment under the conditions specified in paragraph (b) is appropriate and necessary to ensure the safety of operators-in-training while they train for competency evaluations by employers.

In addition, revised paragraph (a)(1) expressly states that an operator-in-training may only operate equipment *under supervision* to ensure that employers understand that supervision is a mandatory component of operating in accordance with revised paragraph (b), and therefore also required under this exception. Because the previous crane standard also required operators-in-training to be supervised, adding that requirement to paragraph (a) is a non-substantive, clarifying amendment (see paragraph (b) for a more thorough discussion of on-the-job and general training requirements).

OSHA did not propose any substantive changes to the existing exemptions for derricks, sideboom cranes, and equipment with a maximum manufacturer-rated hoisting/lifting capacity of 2,000 pounds or less from the training and supervision requirements in revised paragraph (b) and the certification/licensing requirements in revised paragraphs (c) and (d).

OSHA did propose a change to the regulatory text in § 1926.1427(a)(2). While the prior regulatory text in § 1926.1427(a) had exempted operators of this group of equipment from only the “Operator qualification or certification” requirements of section § 1926.1427, corresponding scope provisions in § 1926.1436(q) (derricks), § 1926.1440(a) (sideboom cranes), and § 1926.1441(a) (cranes with capacity of a ton or less) each specify that *none* of the requirements of § 1926.1427 apply to operators of those types of equipment. Therefore, OSHA proposed in the NPRM to better align § 1926.1427 with §§ 1926.1436, 1926.1440, and

1926.1441. However OSHA proposed to apply the new employer evaluation requirement to operators of these types of equipment, so the proposed language of § 1926.1427(a)(2) included an exception from only the certification “and training” requirements of § 1926.1427 (see also the discussion of the proposed amendments to §§ 1926.1436, 1926.1440, and 1926.1441). In light of OSHA’s decision not to apply the new evaluation and documentation requirements to operators of this group of equipment (see discussion of revised paragraph § 1926.1427(f) later in this preamble) OSHA has revised the paragraph to preserve the previous categorical exclusion for this group of equipment from all of the requirements in § 1926.1427.

In the NPRM, OSHA also proposed a new note to § 1926.1427(a)(2) to specify that operators of sideboom cranes must comply with § 1926.1430, which contains the general training requirements in the cranes standard. Sideboom cranes were not previously exempted from the training requirements in § 1926.1430, but training is not expressly addressed in the section of the standard dedicated to these cranes, § 1926.1440. OSHA, therefore, proposed this note to clarify the training requirements that operators of this equipment had to meet. OSHA is retaining the note in the final rule. OSHA did not receive any comments on the note in proposed paragraph (a)(2).

Paragraph (a)(3) preserves a previous provision that states that non-uniformed personnel employed and qualified as operators by the U.S. military meet the licensing/certification requirements of § 1926.1427. OSHA moved this provision from the other certification/qualifications options because it operates as an exception: It specifies that no certification/licensing or training obligation for construction employers is needed beyond verifying that the employee is employed by, and qualified by, the military. For the purpose of confirming that a military operator has the basic crane knowledge and operating skills required through licensing and certification, OSHA defers to the operator qualification process of the U.S. military as the employer. All of the provisions of the crane standard apply when an operator operates equipment for an employer other than the U.S. military.

OSHA requested comment on whether the relocation of this provision was appropriate and whether it is clear that this is an exclusion from all qualification and training requirements of this standard, not just certification.

OSHA did not receive any comments on the introductory text or restructuring of paragraph (a) (other than the requests for additional exceptions, as addressed earlier). OSHA is therefore adopting the changes as proposed.

Paragraph (b) Operator Training.

The requirement for employers to train and evaluate operators before permitting them to operate equipment is contained in paragraph (a). Paragraph (b) now sets forth minimum requirements for training, specifies requirements for trainers, and establishes limitations on the scope of activities for operators-in-training. This paragraph specifies the conditions under which an individual may operate a crane prior to acquiring certification or successfully completing an employer evaluation. These training provisions are intended to provide a safe avenue for employees to gain experience operating cranes in a variety of circumstances.

The training requirements of revised paragraph (b) are largely the same as the previous rule but also clarify that employers must continue to address operator training needs after the operator has been certified and demonstrated competency through employer evaluation on specific equipment. Paragraph (b) further clarifies that the employer's training duty is both equipment-specific and task-specific, and extends until the employer has satisfactorily evaluated the operator-in-training in accordance with paragraph (f)—*Evaluation*, or if any retraining or subsequent training is required to perform the assigned tasks. The revised standard recognizes that even a certified and evaluated operator may need additional training to safely operate new equipment or perform significantly different types of lifts. Therefore, the employer's duty to train remains an ongoing responsibility that must be met as the operator's experiences expand. The prior version of the standard was not as clear (except with respect to when an individual's deficient operating performance or crane knowledge triggers retraining) that the employer's duty to train extends beyond when the individual is certified and evaluated. This updated paragraph clarifies that the employer's duty to train is aimed at ensuring that the employee can safely use the equipment that will be operated.

Under the previous standard, OSHA divided the training requirements between two sections. First, previous § 1926.1427(f)—*Pre-qualification/certification training period*, set forth the limited conditions under which an

operator-in-training could safely operate equipment before being certified. Secondly, previous § 1926.1430—*Training Requirements*, brought together the triggers for operator training requirements, including those for retraining. As discussed in the explanation for this section, OSHA has removed the substantive operator training requirements from § 1926.1430 and replaced them with a cross-reference to new § 1926.1427(b) so that the substance of the training requirements for operators, as well as all operator-in-training requirements, are under one section. Relocating the requirements of previous § 1926.1427(f) to revised § 1926.1427(b) also ensures that the organization of the crane operator requirements corresponds with the order of a typical operator competency program—*i.e.*, initial training generally precedes certification and an operator being determined competent by employer evaluation.

The introductory language to paragraph (b) in the NPRM required the employer to “provide each operator-in-training with sufficient training, through a combination of formal and practical instruction, to ensure that the operator-in-training develops the skills, knowledge, and judgment necessary to operate the equipment safely for assigned work.” (83 FR 23567). OSHA is retaining this language in the final rule except for one change. For reasons discussed later in response to comments to paragraph (f), OSHA decided to remove the term “judgment” from that section and replace it with “the ability to recognize and avert risk.” OSHA is making the same change in the training section. OSHA proposed corresponding language in the training and evaluation sections because an operator-in-training should be trained and evaluated to the same standard. In addition, this revised requirement specifies that training must include a combination of formal and practical instruction.

OSHA notes that this paragraph (b) does not mean that employers must provide novice-level or redundant training when they hire an experienced operator as a new employee. An employee who is an experienced operator may need far less training than a less experienced employee. Employers must determine what level of practical and formal training an operator-in-training would need under paragraph (b) to ensure that they develop the skills, knowledge and ability to recognize and avoid risks necessary for safe crane operation in a variety of conditions. Ultimately, the training methods chosen by the employer must

be effective and responsive to each operator's training needs.

One commenter, while urging OSHA to remove the requirement for operator certification, also urged OSHA to “limit the operator training requirements to employer-based programs that can best be customized to train operators on the specific equipment used at each individual company” (ID-1826). OSHA is not altering the training requirements in paragraph (b), which require training on the subjects listed in § 1926.1427(j)(1) and (2). OSHA believes these requirements provide enough flexibility to allow an employer to efficiently customize its training programs. For example, the standard continues to require the operator to have knowledge of “the information necessary for safe operation of the specific type of equipment the individual will operate” (§ 1926.1427(j)(1)) (emphasis added). There are some general requirements not tied to the operation of particular machines, such as the requirement for training on “Procedures for preventing and responding to power line contact,” that address serious hazards that vary by location, not equipment. The mandated training criteria are longstanding requirements that were adopted by OSHA on the recommendation of its negotiated rulemaking committee because most were included in OSHA's pre-2010 cranes standard (§ 1926.550) or were in industry consensus standards.

A different commenter suggested that OSHA incorporate requirements from the Powered Industrial Truck standard into the crane operator training requirements. This recommendation included more prescriptive language in the regulatory text language specific to training on the controls and instrumentation of the equipment, the operator's manual, and when further training is required (ID-1719). Although the commenter acknowledges that “the proposed rule offers clear guidance on the subject matters that initial training must cover,” it believes its recommended revision is necessary to “provide sufficient guidance on the triggers for supplemental training and re-training/remedial training” (ID-1719).

OSHA is not convinced that more prescriptive language for operator training requirements is required. OSHA believes that the incorporation of the paragraph (j), and subsequently Appendix C, provides employers with thorough lists of subjects on which operators must be trained, including elements such as the equipment's controls. OSHA concludes that the more flexible, less prescriptive language

proposed for the training requirements is more appropriate for crane operator training than the prescriptive list of elements offered by the commenter.

OSHA has not retained the introductory text in previous paragraph (f), which required that a non-certified employee could only operate as an operator-in-training within the limitations of paragraph (f). That introductory text has now been supplanted by the language in revised paragraphs § 1926.1427(a)(1) and (b), without substantive change other than the addition of the evaluation requirement.

Most of the specific training requirements in paragraph (b) are identical or similar to the previous training requirements. Paragraph (b)(1) requires the employer to provide the operator-in-training with instruction on the subjects in paragraph (j). This requirement is identical to the requirement in previous § 1926.1430(c)(1)—*Operators-in-Training for equipment where certification or qualification is required by this subpart*. However, under the revised standard, even after the operator-in-training is determined competent by employer evaluation, the employer's training duty can continue when the operator operates new equipment or performs tasks that require new skills or knowledge. An individual may be a fully certified and evaluated operator with respect to one piece of equipment such that he or she is allowed to operate that equipment independently, but simultaneously be an operator-in-training (and thus subject to the operating restrictions in the standard) with respect to different equipment or tasks that require significantly different skills or knowledge to ensure safety.

Section 1926.1427(j)—*Certification criteria*, which remains unchanged, specifies the mandatory subject matter for third-party licensing and certification, as recommended by C-DAC. It requires a written and a practical test. Paragraph (j)(1)(i) specifies areas of information that must be covered by the written certification test for the type of crane that an individual will operate, such as controls, operational/performance characteristics, load calculations, and ground conditions. This paragraph also references a more comprehensive list of areas of technical knowledge in Appendix C—*Operator Certification: Written Examination; Technical Knowledge Criteria*. Paragraph (j)(2) identifies the operating skill areas that must be covered by the practical certification test.

OSHA concludes that operators-in-training must continue to receive training in the subject matter identified in this section as recommended by C-DAC. However, as proposed, OSHA relocated the training requirement in § 1926.1430(c)(1) to revised § 1926.1427(b) so that the requirements for operators-in-training may all be found in one place. New language in revised § 1926.1430—*Training*, discussed separately below in this preamble, references § 1926.1427(a) and (b) rather than repeat the same requirement.

Paragraph (b)(2) requires the employer to ensure that a trainer continuously monitors operators-in-training during all crane operations. This requirement is identical to the previous requirement for continuous monitoring under previous paragraph (f)(3).

Paragraph (b)(3) requires the employer to assign the operator-in-training only tasks that are within his or her ability. This requirement is substantively identical to the requirement under previous paragraph (f)(2). OSHA made minor changes to the language of this requirement to clarify that it is the employer's duty to assign tasks to the operator-in-training.

OSHA also relocated the requirements of previous paragraph (f)(1). The previous paragraph (f)(1) required the employer to provide each operator-in-training with training sufficient to operate safely under the limitations of previous paragraph (f). Its requirements are retained in revised paragraphs (b)(1) and (3), which state that the operator-in-training must be trained on the subject matter specified in paragraph (j) of this section and may only perform tasks that are within his or her abilities.

Paragraph (b)(3) retains a revised version of the limitations specified in previous paragraph (f)(5), which precluded operators-in-training from operating equipment next to energized power lines; from hoisting personnel; or from performing multiple-equipment lifts, multi-lift rigging operations, or lifts over shafts, cofferdams or in a tank farm. OSHA previously determined in the 2010 final rule that these equipment operations and worksite conditions are too complex, or present such heightened risks, that it would be unreasonably dangerous if an operator-in-training were to operate the equipment in these circumstances (75 FR 48024). However, in the NPRM OSHA announced that it would consider revising these limitations because they may have the effect of preventing operators from gaining the experience necessary to conduct these lifts.

OSHA received comments supportive of removing these limitations on operators-in-training. A labor union commented that these tasks "should not be prohibited" because "an operator must be trained in how to safely perform them" (ID-1615). Another commenter, in urging OSHA to remove operation in tank farms from the list, argued that "[t]he continuous monitoring requirement specified in the Rule along with other safe work practices (e.g., work permits, joint jobsite visits, etc.) are sufficient to identify and mitigate hazards that an operator-in-training may encounter in a tank farm" (ID-1647). OSHA did not receive additional comments on this issue.

In response to these comments, OSHA revised the language of the regulatory text to provide a measured expansion of the prior rule that removes the prohibition as requested by the commenters. Operators-in-training will now be allowed to perform these lifts, but only if they have been certified in accordance with § 1926.1427(c). The 2010 crane standard only allowed an operator to perform these lifts after becoming certified, so OSHA is preserving the status quo in that respect. OSHA continues to agree with C-DAC that these lifts are too complex and potentially dangerous to be attempted by an operator candidate who may lack the basic knowledge and skills required for general crane operation. But the prior regulatory text left no way forward for even a certified operator to gain the experience necessary to perform those functions safely, and did not leave room for an employer to have an operator evaluated on these tasks in accordance with revised § 1926.1427(f). This language change therefore respects C-DAC's intent to prevent operators who have not acquired the baseline knowledge of crane operation provided by certification from performing these complex lifts, while allowing operators-in-training the opportunity to train performing these lifts under the direction of a trainer prior to being evaluated to perform these lifts as an operator. Note that the employer must still train the operator on these specialized lifts before allowing the operator to attempt them, even under supervision, because paragraph (b)(3) only permits the employer to assign tasks to an operator-in-training that are "within the operator-in-training's ability."

Paragraph (b)(4) prescribes minimum requirements for monitored training of operators-in-training and trainers who monitor operators-in-training. Revised (b)(4)(i) specifies requirements for the

required trainer which are similar to requirements in paragraph (f)(3) of the 2010 crane standard. Paragraph (b)(4)(i)(A), which requires that the trainer must be an employee or agent of the operator-in-training's employer, is identical to paragraph (f)(3)(i) of the 2010 crane standard.

Paragraph (b)(4)(i)(B) requires that the trainer must "have the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use." This requirement is the same as the proposal but is different from the requirements of paragraph § 1926.1427(f)(3) of the 2010 crane standard, which required that a trainer either be a certified operator or have passed the written part of a certification test, and have familiarity with the equipment's controls. This revision recognizes that some uncertified trainers may have the knowledge and experience to be competent to teach or monitor the equipment operations of an operator-in-training.

In the NPRM, OSHA explained that it proposed this change for three reasons. First, merely requiring that the trainer must have passed the written part of a certification test is insufficient to confirm a trainer's ability to train other operators. Paragraph (f)(3) of the 2010 crane rule presumed that all certified operators or individuals who passed only written certification tests have the skills to monitor an operator-in-training, but as explained above, certification alone is insufficient to ensure that operators are competent to safely operate a crane. Under the final rule, even after the basic crane knowledge and operating skills of operators have been confirmed through certification testing, employers must still determine through evaluation if operator training already provided is sufficient or if more is necessary, based on the complexity of equipment that will be used and activity that will be performed. Thus, requiring an individual to pass a written certification exam appears to be likewise insufficient as the sole criterion for confirming a trainer's ability to monitor and train an operator-in-training.

Second, using certification as a required criterion for the trainer could exclude individuals from the role who have extensive operating experience and familiarity with the controls of the relevant equipment but do not possess a certification. Under the trainer requirements of the 2010 crane rule, an experienced but uncertified operator may have been required to be monitored by a less experienced but certified individual. In stark contrast, an uncertified person who has significant

experience operating the particular equipment used during the training may have more insight into the function of its controls and the nuances of its operation than someone who is certified for that type of equipment but has never operated that particular equipment. Allowing only certified operators in these training roles is also inconsistent with the industry practice of pairing inexperienced operators with experienced trainers who monitor the safety and professional development of the inexperienced operator.

Third, passing a written certification test is not a definitive indicator of safe training practices in the industry and requiring certification of all trainers could significantly alter many previous work practices in the industry. Stakeholder feedback suggests that many different employees or agents of an employer successfully fulfill the role of a trainer but may not be certified. Some formal training might be administered by an individual who is not certified but has extensive knowledge of a particular make and model of crane. For example, some crane manufacturers offer technical training to their customers regarding the operation, maintenance, and troubleshooting of cranes they sell (see Reports # 4, 5, 13 of ID-0673). On-the-job training is often conducted by a seasoned crane operator with years of experience (see Reports # 1, 2, 19, 23, 28 of ID-0673) or in some cases by a retired operator (see Report # 26 of ID-0673). These operators may no longer be certified. In addition, an employer might employ various non-certified employees, such as an experienced safety manager, foreman, or site manager, to monitor some work training activities, or an experienced small business owner might fill the role of trainer in some cases (see Reports # 1, 2, 15, 26 of ID-0673). And OSHA spoke with three companies that offer other employers private training from experienced operators who are not certified (see Reports # 20, 21, 22 of ID-0673). In sum, stakeholders reported that some individuals who have the necessary knowledge, training, and experience but do not possess a certification or have not passed the written certification exam can, nevertheless, be successful trainers.

In the proposed revision of this provision, OSHA proposed language similar to the requirement in ASME B30.5 (2014) at 5-3.1.2(e) that training must be performed by a "designated person who, by experience and training, fulfills the requirements of a qualified person." The language is also similar to the "qualified person" definition that is

familiar to the construction industry. Under this language, employers have some flexibility in determining the level of knowledge and experience that the trainer must possess based on the skill level of the operator-in-training and the nature of the activity performed.¹⁵

OSHA received comments supporting the proposed changes to the trainer criteria. A trade association agreed with the proposed language because it provides employers with "flexibility in determining the level of knowledge and experience that the trainer must possess based on the skill level of the operator-in-training and the nature of the activity performed . . . even when the individual has not passed the written certification exam, possesses an operator certification, or has prior experience operating a crane" (ID-1801). One commenter agreed with OSHA that certification or passing the written part of the certification test is not determinative of whether an individual can train an operator-in-training, stating that it "fails as a measure of a trainer's competencies and capabilities" (ID-1821). Similarly, a comment supporting the proposed language asserted that "[t]he current requirement that trainers obtain certification or at least pass the written portion of the certification requirement does not necessarily correlate with the individual's ability to provide practical instruction or impart valuable knowledge to other employees" (ID-1631).

A different commenter supported the "requirement that the trainer should be a 'qualified person,'" as defined in the cranes standard, without other requirements (ID-1828). OSHA believes that the proposed new language, which the commenter did not directly oppose, comes close to that approach while still providing the additional focus on the training.

Several other commenters opposed the proposed change and preferred that the trainers at least pass the written portion of the certification exam. One commenter responded that trainers possessing certification have been "a long established standard and best practice among the industry," and interprets ASME B30.5's term "qualified operator" to mean "one who possesses a certification for the type of equipment for which he/she is instructing an operator-in-training" (ID-1816). OSHA disagrees with that interpretation of

¹⁵ OSHA expects that in many cases, the trainer will possess a certification. However, this final rule allows the possibility that the trainer's experience with the task and equipment used could be sufficient for providing training even without the trainer possessing a certification.

ASME B30.5 because that definition, like the definition of "qualified person" in OSHA's cranes standard, clearly states that certification is only one of two paths to become a qualified person.¹⁶

That commenter also compared operator certification to a driver's license and stated that "one would not want a driving instructor who herself does not possess a driver's license," (id.), but there may be many reasons why an experienced crane operator may no longer possess a valid certification. Many seasoned crane operators who have safely operated cranes for decades have the knowledge, operating experience, and ability to effectively train and direct an inexperienced operator even though they never had a need to acquire a certification during the course of their operating careers or let their certifications expire after transitioning into new roles. Contrary to the commenter's assertion, the seasoned operator may be preferred as a trainer because of the greater experience, particularly if that experience is with the particular equipment that will be operated. OSHA concludes that the emphasis of the trainer qualifications should be on a person's ability to train and direct an operator-in-training, rather than whether the trainer possesses a certification.

Another commenter stated that it is "infeasible to consider how a trainer or evaluator can determine an operators qualifications if they have never operated a crane . . . OSHA should consider going to the original definition they are using for the trainer" (ID-1623). That comment incorrectly assumes that trainers without a current certification, or those who have not passed the written portion of a certification exam, have not previously operated a crane. In some cases, the trainers may be retired or semi-retired operators who are fully capable of training other operators but who have not elected to take an operator certification examination because they no longer operate cranes. The record of the 2010 rulemaking and this rulemaking also contains a number of statements indicating that some employers have very experienced operators who have difficulty with written exams (see, e.g., 73 FR 59816-59817). In some cases, the language or literacy barriers that impede an experienced operator from passing a written exam may have no relevance to that person's ability to instruct an

operator-in-training. OSHA does not agree that such a trainer should be disqualified from training an operator so long as there is effective communication between the operator-in-training and the trainer.¹⁷

One certification organization conceded that "certification may not be an appropriate 'sole' criterion or a sufficient indication of competence as a trainer," but contended that it is an "appropriately necessary condition of establishing such competence and ensuring a 'baseline' of knowledge and skills" (ID-1755). That commenter suggested that OSHA go further than the previous rule and require that trainers be both certified and possess the requisite knowledge, training, and experience.

OSHA does not agree that it is necessary to go as far as the commenter suggests in order to ensure that appropriate trainers are instructing operators-in-training. As stated earlier, OSHA anticipates that many trainers will be certified operators. As one commenter noticed, the proposed language "does not preclude employers from following the existing trainer requirements if they so choose" (ID-1801). Moreover, a certification could provide partial evidence of the knowledge, training, and experience necessary to train an operator-in-training, but is not sufficient for verifying competency and safe crane operation. The requirement for even a partially certified trainer would come at the price of excluding the experienced trainers currently relied on by the earlier commenter (ID-1826). The final rule will preserve greater flexibility for the employer seeking to ensure safety through available resources, and is also more closely aligned with the existing industry guidance in ASME B30.5.

One of the certification organizations asserted that "[r]equiring that a trainer have a baseline of knowledge and skills as an operator is likely, not only to improve the quality of training, but also to increase safety during training in the event the operator-in-training engages in an unsafe act and the trainer is forced to intervene" (ID-1755). The agency

¹⁷ A different membership organization agreed with OSHA's proposal and drew on its members' experience in using experienced but un-certified instructors. The commenter considered OSHA's revised language "appropriate" because members of their organization often assign as trainers experienced operators who may not have passed the written certification exam, but have more experience with the equipment than some certified operators. (See ID-1826). Not moving forward with the proposed language, this commenter warned, "would prevent certain operators who are highly qualified, experienced and knowledgeable on certain equipment from serving as trainers" (ID-1826).

agrees that it is important for the trainer to be able to direct an operator-in-training should their operation potentially result in an incident or near miss and has included that requirement in the standard ("Have the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use"). But requiring that a trainer must have passed the written part of the certification test does not indicate that a trainer would be able to do more. OSHA's standard, both as revised and prior to this revision, does not permit anyone other than a certified operator to be at the controls absent supervision, so a trainer who has only passed the written exam would not be permitted to operate the crane without another person serving as a trainer to that person. It does not follow that a person who has passed the written portion of the certification exam, but not necessarily demonstrated any practical skill at operating a crane, would be inherently better prepared to correct an operator than a person who has the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use.

It is true that a trainer who is a certified operator (and properly evaluated under the new standard) would be permitted to sit in the cab and take over the controls in the event of perceived unsafe action, but there is no record that this is a common occurrence or has been shown to be effective. In the absence of a clearer record on this point, OSHA is hesitant to disturb C-DAC's judgment that requiring all trainers to be fully certified operators was unnecessarily restrictive (see 75 FR 48024). In its 2008 NPRM explanation of the trainer requirements, which were included without change in the final rule, OSHA acknowledged that full certification was unnecessary and explained that the trainer's knowledge of the particular equipment being operated was paramount to certification:

The Committee determined that a supervisor who had passed the written portion of a certification test would not need to be sufficiently proficient to pass the practical portion in order to effectively supervise a trainee/apprentice. However, both in the instance where the supervisor is certified and in the instance where he/she is not certified but has passed the written portion of the certification test, the Committee believed that it is necessary that he/she be familiar with the proper use of the equipment's controls, since such knowledge is essential to being able to effectively supervise a trainee/apprentice.

(73 FR 59815 (Oct. 9, 2008)). OSHA does not find any of the comments persuasive enough to further restrict

¹⁶ See definition of "qualified person" in ASME B30.5 (2004) ("by possession of a recognized degree in an applicable field or certificate of professional standing, or who, by extensive knowledge, framing, and experience . . .") (emphasis added).

employer options or to shift the focus away from the trainer's knowledge of the equipment to be used by the operator-in-training.

As stated previously, OSHA proposed language for its similarity to language from ASME B30.5 and OSHA's qualified person standard, and the flexibility it offers employers in choosing trainers for their crane operators. OSHA considered simply requiring a trainer to be a "qualified person," but relying solely on the definition of qualified person as criteria for trainers presents a problem. In § 1926.1401, OSHA defines a qualified person as one "who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, successfully demonstrated the ability to solve/ resolve problems relating to the subject matter, the work, or the project." However, even under the previous standard OSHA did not intend for the possession of a certificate to be enough for an individual to be a trainer—the previous standard also required knowledge of the equipment's controls. Relying on the definition of "qualified person" in the crane standard as the lone criteria for trainers would mean that anyone possessing a certificate would automatically be a "qualified person," regardless of their knowledge of any of the controls or other aspects of the equipment to be operated. OSHA will retain its proposed language.

The remainder of paragraph (b)(4) does not contain any substantive changes from the previous rule, did not receive any comments, and is promulgated as proposed. Paragraph (b)(4)(ii) prohibits the trainer from performing any task that detracts from his or her ability to monitor the operator-in-training. It is identical to previous paragraph (f)(3)(iii).

Paragraph (b)(4)(iii) requires the operator's trainer and the operator-in-training to be in each other's direct line of sight, and that they communicate verbally or with hand signals. This requirement is substantively the same as previous paragraph (f)(3)(iv), with minor simplifying changes. The revised standard relocates this provision to an independent subparagraph to clarify that the employer has the ultimate responsibility for ensuring compliance with this requirement. This revised paragraph also retains an exception for tower cranes so that the trainer and operator-in-training must be in direct communication with each other, but are not required to maintain a direct line of sight because the height of the operator's station may make it infeasible. (See also, the discussion of

previous paragraph (f)(3)(iv) in the preamble to the 2010 final crane rule at 75 FR 48024.) This exclusion in this final rule is also substantively the same as paragraph (f)(3)(iv) of the 2010 crane rule, with minor simplifying language changes.

Paragraph (b)(4)(iv) requires that an operator-in-training be monitored while operating the equipment at all times except for short breaks and retains the conditions specifying monitoring under paragraph (f)(4) of the 2010 crane rule. Paragraph (b)(4)(iv)(A) requires that a trainer's break while the operator-in-training runs the crane can last no longer than 15 minutes and can occur no more than once per hour. Paragraph (b)(4)(iv)(B) requires the employer to ensure that the trainer and operator-in-training communicate about the tasks, if any, that can and cannot be performed in the trainer's absence while on break. Paragraph (b)(4)(iv)(C) limits tasks performed during the trainer's break to only those that are within the abilities of the operator-in-training.

Paragraph (b)(5) requires the employer to provide retraining when, based on the performance of the operator or an assessment of the operator's knowledge, there is an indication that retraining is necessary. This language is identical to the requirement in previous § 1926.1430(g)(2) but is included in paragraph (b) to consolidate all substantive training requirements to the extent practical for operators covered under § 1926.1427. Because the requirements of § 1926.1430(g) apply more broadly to all employees covered by this standard, however, OSHA is not deleting that requirement from § 1926.1430(g). Thus, identical language will appear in two different paragraphs of the final standard. This retraining requirement is consistent with the retraining described as already implemented by employers who spoke with OSHA during interviews and site visits (see Reports # 1, 2, 3, 15, 18, 19, 22, 26 of ID-0673). Note that the need for retraining under paragraph (b)(5) would also trigger the requirement for re-evaluation under paragraph (f)(7) (see also preamble discussion below of paragraph (f)—*Evaluation*).

OSHA received one substantive comment proposing revisions to the retraining requirements. The commenter recommends incorporating language from the Powered Industrial Trucks standard that states when retraining is necessary, including unsafe operation, an accident or near-miss, a failed evaluation, or insufficiency of training (ID-1719). OSHA does not believe this is necessary because the revised retraining requirements allow the

employer to determine whether an operator needs additional training based on their performance and their knowledge. This final rule not only requires that retraining be triggered based on an operator's performance, but it also requires an employer to conduct retraining if the operator indicates it is necessary (see revised § 1926.1427(b)(5)). OSHA concludes that this approach gives employers more flexibility in determining when retraining is needed to ensure safety.

One commenter also noted that OSHA uses the words "retraining" and "refresher training" interchangeably in proposed paragraph (b)(5) without defining either term, and requested clarification (ID-1719). Another commenter agreed that additional clarification would be helpful.¹⁸ In response to such comments, OSHA will replace the term "refresher training" with "retraining".

Paragraph (c) Operator Certification and Licensing.

At the ACCSH meeting on March 31–April 1, 2015, ACCSH members unanimously recommended that OSHA move forward with a rulemaking that retains certification and permanently extends the employer's duty to ensure the competency of operators (OSHA–2015–0002–0037). Paragraph (c) retains the certification and licensing structure of the 2010 crane standard with only a few minor modifications intended to improve comprehension of certification/licensing requirements.

First, OSHA moved the military qualification provisions of previous § 1926.1427(e)(4) to the exception in paragraph (a), as noted earlier.

Second, OSHA removed the reference to an "option" with respect to mandatory compliance with previous state and local licensing requirements.

¹⁸ "OSHA discusses in detail an employer's obligation to provide ongoing training as necessary when an operator's experience expands or is assigned to operate new equipment or perform new tasks. However, this concept is not explicitly stated anywhere in the proposed regulatory text. Only refresher training, required when indicated by deficiencies in the employee's demonstrations of crane knowledge and equipment operation, is present in proposed paragraphs (b)(5) and (f)(5), which do not apply to new equipment or an expansion of experience. If OSHA's intent is to clarify an employer's obligation to provide ongoing training, we believe the proposed regulatory text fails to make this clear." (ID-1801). In response to the comment that OSHA does not explicitly include ongoing training provisions in the regulatory text, the agency disagrees. This requirement extends from the duty in paragraph (b)(1) that employers must train operators to ensure they have the knowledge, skills, and ability to recognize and avert risk necessary to operate the equipment safely for assigned work. This ongoing training requirement need not be restated elsewhere in the regulatory text.

When a state or local government issues operator licenses for equipment covered under subpart CC, and that government licensing program meets the requirements specified in the standard, then employers must ensure that equipment operators are properly licensed when working in the state or local jurisdiction, even if the operator is also certified by a nationally accredited certification organization. However, the state or local license would satisfy OSHA's certification requirement: OSHA will not *require* an operator who obtains such a state or local license to also obtain a separate certification from a nationally accredited certification organization or an employer-audited program.

The content of revised paragraph (c)(1) is virtually identical to provisions in § 1926.1427(e)(2) of the 2010 crane rule, with one exception: Revised (c)(1)(v). For a more detailed explanation of the other provisions in this paragraph, see the preamble discussion of § 1926.1427(e)(2) in the 2010 crane rule at 75 FR 48021–23 (August 9, 2010).

As in the 2010 crane standard, this final rule includes minimum “federal floor” criteria for state and local crane operator licensing. If a license does not meet the minimum “federal floor” criteria specified in OSHA's crane standard (see revised § 1427(c)(1) and (j)), then the state or locality could still enforce its own licensing requirements, but employers operating cranes for construction within that jurisdiction could not rely on that license to satisfy OSHA's operator certification requirement. The employer must then comply with one of the other options for certification/qualification specified by this final rule. In the NPRM, OSHA proposed amending § 1926.1427(c)(1)(v) to add a new requirement to the “federal floor”: The license must specify the “type, or type and capacity” of equipment for which the license is applicable. The purpose of this proposed change was to make it easier to determine whether the licensing procedure required the operator to have knowledge about the “type” of crane to be operated, as required by OSHA's standard in § 1926.1427(j)(1).

OSHA received three comments (ID–1611, 1779, 1824) warning that inserting any additional requirements into the “federal floor” for state or local licenses could make it more likely that some states or localities would not meet that “federal floor.” For employers in jurisdictions where the state or local licensing program did not comply with the federal floor, they would need to ensure that their operators were not

only licensed as required by the state or locality but also certified through a third-party program or audited employer program in order to comply with OSHA's standard. One commenter expressed concern that OSHA's proposed change would result in “duplicative or multiple layers of identical certification requirements” for employers, and that a change designed primarily to facilitate compliance (rather than to add a substantive safety requirement) would not warrant the potential impact for employers (ID–1779). “Provided that the state or local licensing requirement is in fact equivalent or more stringent than the OSHA expectation of determining competency,” the commenter stated, “then duplicative certification is unduly burdensome, especially for small businesses” (Id.).

OSHA is sensitive to concerns raised about unnecessary regulatory duplication, particularly when the purpose of the change is to facilitate compliance rather than adding a new safety measure. To avoid needless burden, OSHA has decided not to implement the proposed change. Proposed paragraph (c)(1)(v) has been removed and proposed paragraph (c)(1)(vi) is designated (c)(1)(v).

The remainder of the requirements of paragraph (c)(1) are substantively the same as those in § 1926.1427(a)(1), (a)(2), and (e) of the previous rule, except that OSHA combined the requirements of those three paragraphs into one paragraph and clarified some of the language to facilitate better comprehension of state or local government entity requirements. Paragraph (c) restates more clearly the requirement in previous paragraph (a)(1) that the employer must ensure operators are certified and licensed. Paragraph (c)(1) substantially incorporates the requirements of previous paragraph (a)(1)(i) and combines it with the licensing criteria in previous paragraph (e)(2)(i)–(iv). Paragraph (c)(1)(v) is substantially the same as previous paragraph (e)(3)(ii).

Paragraph (c)(2) specifies the certification requirements for two remaining situations: The construction occurs in a state or local jurisdiction that does not require licensing of equipment operators, or the construction occurs in a state or local jurisdiction where the licensing program does not meet the “federal floor” of requirements established in this standard. In each of those situations, the operator would have to be certified in accordance with paragraph (d) (third-party certification) or (e) (audited employer program) of

this section. Paragraph (c)(2) is identical to previous § 1926.1427(a)(2), except that it references only the paragraphs containing criteria for certification by an accredited testing organization and an audited employer program—and not the option for qualification by the U.S. military which is addressed as a scope exclusion in Paragraph (a)(3). Revised paragraphs (d) and (e), discussed later, correspond to previous paragraphs § 1926.1427 (b) and (c), respectively.

Paragraph (c)(3) requires employers to provide at no cost to employees the certification or licensing required by § 1926.1427. This revised requirement is almost identical to that of § 1926.1427(a)(4) of the previous rule, except that it has been revised to clarify that it applies to all operators certified or licensed after the effective date of the new standard, not just those operators who were “employed by the employer on November 8, 2010,” as previous § 1926.1427(a)(4) stated.¹⁹ This revision is in line with, and will be enforced similarly to, other OSHA provisions that require employers to provide personal protective equipment, medical examinations, or other functions at no cost to the employees. The requirement would also be consistent with the way in which OSHA assessed costs in the 2010 economic analysis. In the final economic analysis of subpart CC, OSHA modeled all of the costs for compliance with the previous certification requirements as if all employers always paid for the certifications/licenses they provide for operators. Note, however, that this provision does not mandate an employer to maintain its employment of an employee/operator who cannot pass certification testing or who is not a good operator candidate. Furthermore, an employee who does not possess a certification may still be allowed by the employer to operate a crane, but only as an operator-in-training and through the employer's compliance with all requirements of paragraph (b) of this section.

Paragraph (c)(4) retains, without change, the content of previous § 1926.1427(g), which states that 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.

¹⁹ As in previous § 1926.1427(a)(4), revised paragraph (c)(3) does not require employers to cover the costs to employees of licensing that does not conform to the requirements of § 1926.1427.

Paragraph (d)—Certification by an Accredited Crane Operator Testing Organization.

As noted above, paragraph (c)(2) provides two options for certification: Compliance with paragraph (d) (third-party certification) or paragraph (e) (audited employer program). Compliance with the requirements of paragraph (d) is the option that OSHA expects the vast majority of employers to use. Paragraph (d) retains, with some non-substantive language clarification and two exceptions discussed below, the requirements of previous paragraph § 1926.1427(b) and is unchanged from the proposal.

First, the most significant change is that paragraph (d)(1)(ii)(B) replaces the references to certification by “type and capacity” that appeared in previous paragraph (b)(1)(ii)(B) with “type, or type and capacity,” as recommended by ACCSH (see OSHA–2015–0002–0037 pg. 71). OSHA has therefore also reworded previous paragraph § 1926.1427(b)(1)(ii)(B) to remove the requirement that an operator’s certificate list a lifting capacity for which the operator was certified. The need for these changes is explained in the “Need for a Rule” section of this preamble. These revisions remove the requirement to obtain a certification for a designated crane capacity, but also clarify in the regulatory text that OSHA considers testing organizations whose programs provide certifications that specify “type and capacity” equally acceptable.

The “type, or type and capacity” language was requested by Crane Institute Certification and recommended by ACCSH. Several other commenters also made this request (OSHA–2015–0002–0036). The language has been included in the final rule to make clear that while all certifying bodies must certify by type of crane for their certifications to meet OSHA’s requirements, testing organizations may also choose to specify for their certifications different levels of rated lifting capacity of cranes.

As explained in the section *Elimination of the Requirement to Certify Based on Capacity of Crane* of this final rule, almost all the comments received relating to the proposed removal of the requirement to certify by capacity were in favor of its removal. The commenters were split, however, on whether OSHA should keep the “type, or type and capacity” language in the regulatory text. One of those commenters specifically requested OSHA to keep the proposed language because many of its members “currently

require certification by type and capacity, and have expressed that they find both types of certification to be beneficial to establishing a baseline operator competency,” and added that this language “will help alleviate confusion about the changes to the requirement and allow employers to maintain their current certification requirements as they see fit” (ID–1735). The one commenter who opposed OSHA’s decision to remove the requirement for certification by capacity concluded that if OSHA did remove that requirement, then ACCSH’s recommended language of “type, or type and capacity” should stay in the rule (ID–1235).

The agency also received comments requesting that OSHA not include the language “or type and capacity” in the standard. Two of these comments were submitted by certification bodies that currently provide certification by type only. Both believe removing this language will add clarity and reduce confusions among the regulated community (ID–1755 and 1816). One of them is concerned that keeping the language will inaccurately convey that “the only options for certification are either (a) by type, or (b) by type and capacity,” whereas “testing organizations may in fact seek to consider factors other than ‘type’ or capacity when developing operator certification programs (ID–1755). A different commenter believes removing the reference to capacity “does not restrict crane certifying bodies from certifying according to capacity should they so choose” (ID–1611). Another commenter suggested OSHA revise the proposed language to require certification “by type and/or type and capacity” (ID–1828).

OSHA has decided to retain the proposed “type, or type and capacity” language for paragraph (d)(1)(ii)(B) because it makes it clear that the agency will accept certifications that are otherwise compliant with the standard from any of the four accredited certification bodies of which OSHA is aware. OSHA does not believe that including this language will lead to confusion in the industry because, currently, certifications are offered by type or type and capacity. None of the comments recommending the removal of certification expressed any confusion about including this language.²⁰

²⁰ The requested revision that the language read “by type and/or type and capacity” creates confusion because it could be read as requiring an employer to have either a certification by “type” or “type and capacity” or to have two certifications—one by “type” and another by “type and capacity.” OSHA’s revised language makes clear that, for a

Second, the revision does not include the reference in previous § 1926.1427(b)(2) to an employee being “deemed qualified” to operate equipment under certain conditions if no accredited testing organization offers certification examinations for a specific type of equipment. A credentialing organization suggested that OSHA “remove misconceptions regarding what it means to be ‘certified’” by replacing “deemed certified” with “deemed to have complied with the certification requirements of this section” because it is “more precise while remaining entirely consistent with the language currently proposed by OSHA” (ID–1668). OSHA agrees with the commenter and is revising the regulatory text to adopt their suggested language. This change is intended to avoid the misconception that an operator could be considered competent to safely operate equipment without also being evaluated and determined competent by the operator’s employer.²¹

All other provisions in paragraph (d) are unchanged from previous paragraph (b), and discussion and justification of these provisions can be found in the preamble to the 2010 final cranes rule (75 FR 48017).

A labor union commented that paragraph (d)(2) should be revised to establish a benchmark for the types of cranes for which a separate certification is required. They argue that without a benchmark, OSHA will be “effectively delegating to an accredited testing organizations responsibility for determining the number of types of cranes for which a separate certification is required” This concerns the organization because “for-profit testing organizations, which benefit financially from an increased number of mandatory certifications, have an incentive to develop testing for additional types of crane, regardless of whether extra testing will improve safety” (ID–1719). They propose that operators of

certification to be compliant with OSHA standards, the certification must, at the very least, include the type of crane on which the operator was certified. Furthermore, retaining this language is responsive to the recommendation from ACCSH.

²¹ OSHA had included the “deemed qualified” language simply as a means of clarifying that an operator would be considered qualified to operate a crane of the same capacity or less than the one on which the operator was tested. The use of “qualified” instead of “certified” at that time was meant to reflect the varying paths to compliance with the standard: Certification through a third party or employer-audited program, or other qualification through a state or licensing program or meeting the requirements specified by the U.S. military. In this final rule, OSHA has clarified the language by replacing “deemed qualified” with “deemed to have complied with the certification requirements of this section.”

equipment for which there is no certification must still be certified on the equipment most similar to the equipment they will operate, but only if a national consensus standard does not recommend a separate certification for the equipment. In explaining their reliance on national consensus standards for making this determination, they point to the National Commission for the Certification of Crane Operator's (NCCCO) Crane Type Advisory Group, a group that has yet to publish a standard but is considering "the skill sets required to operate various types of cranes for which separate certifications are not offered and a comparison of those skill sets to determine if they are already encompassed in existing testing (ID-1719).

OSHA explained its rationale in the preamble of the 2010 cranes rule for including similar language in previous § 1926.1427(b)(2). When OSHA was informed that there were not certification tests for a number of cranes, it decided to add "flexibility in the certification requirement to deal with specialized types of cranes or newly developed equipment for which certification examinations might not be available." (75 FR 48018). To do this, OSHA applied C-DAC's proposed requirement for dedicated pile drivers—that operators be certified on the equipment most similar to the equipment they operated if there was no available certification test for the equipment they operated. OSHA has not adopted the recommendation of the labor union (ID-1719) because the agency does not believe it is in the best position to determine the various types of cranes for which certifications should be necessary. It would be unwise for OSHA to consider a major change to the standard before the NCCCO Crane Type Advisory Group concludes its work, which could include a consensus standard that identifies crane types that require a similar skillset and knowledge to operate.

OSHA requested comment on whether it should delete the requirement for operator recertification every five years, which was proposed as § 1926.1427(d)(4). OSHA mostly received comments in support of retaining the recertification requirement. One certification organization was not convinced that retraining and re-evaluation are sufficient substitutes for recertification. The commenter contrasted the retraining and re-evaluation requirements with recertification, asserting that:

Recertification procedures of an accredited certification program are, by their nature, subject to standardized psychometric rigor and impartiality. By incorporating the rigorous test development and administration standards required by accrediting bodies, recertification requirements provide substantial benefits that are likely to enhance public confidence and improve safety at the worksite.

(ID-1755). Similarly, a different commenter warned:

Remanding the recertification process to the discretion of employers will result in inconsistencies in how operators are assessed on their continuing knowledge and skills as well as an increased risk of endangering the public. As operators move between employers, there will be confusion in the marketplace about skill levels, the potential need for costly retraining, and increased safety concerns.

(ID-1668). A consultant added that "[r]ecertifying by 3rd party is completely unbiased," and focuses on new information that may not be conveyed during an evaluation (ID-1764). Another commenter expressed concern about relying on retraining in lieu of recertification, arguing that "a training program does not indicate skill mastery or competency as measured against a defensible set of standards set through an industry-wide process" (ID-1150).

Many commenters agreed that recertification was necessary to continue establishing a baseline knowledge of crane operation (ID-1150, 1719, 1744, 1755, 1768, 1816, 1828). For example, one commenter stated certification is an ongoing process and recertification is necessary for an operator to maintain the knowledge and skills necessary for safe crane operation because "unused skills atrophy and there are ever-evolving technological changes in newly-manufactured cranes and periodic regulatory changes" (ID-1719). To this point, a certification body submitted comments that at least 3,755 certified operators have failed their recertification exams, operators that "[i]f OSHA were to delete the requirement for operator recertification every five years . . . would be legally able to continue operating cranes—even though an independent, third-party assessment would have determined them to lack the baseline competence to do so" (ID-1755).

Additionally, many of the comments supportive of keeping the recertification requirement pointed out accreditation organizations ANSI and NCCA require recertification as part of an accredited certification program (ID-1150, 1668, 1719, 1744, 1755, 1794, 1816, 1828). An affiliate of one of these organizations

commented that ISO 17024, a consensus standard "recognized by several federal agencies as a requirement for credentialing organizations that offer certification," requires recertification (ID-1150). Another comment noted that many states and localities also require recertification of crane operators (ID-1719).

Some supporters of the recertification requirement recommended that OSHA also require a set number of hours an operator must spend gaining experience with the crane prior to recertifying. One of these commenters explained that each certification body requires an operator to document 1,000 hours of "crane-related experience" in the five years prior to recertification and, accordingly, recommended that OSHA require operators attempting to recertify to meet this standard (ID-1816). During its 2010 rulemaking, OSHA considered and rejected a nearly identical request for seat-hour requirements (75 FR 48019).

The record amply demonstrates the sufficiency of the accreditation process that must be passed for a testing organization to become accredited. That process is designed to ensure that accredited testing organizations use a sufficiently reliable process for certifying operators. The record also shows that such a mechanism is an effective one for determining operator competence There is insufficient information in the record to include an additional requirement for 1,000 hours of "crane related experience" The commenter does not specify what should be included in "crane related experience," or why 1,000 hours would be the appropriate amount of such experience for this purpose." (75 FR 48019). The commenter has not presented any new evidence to persuade OSHA to change its position. If all accrediting bodies did require the certification bodies they accredit to include a minimum amount of time for "crane related experience," then the commenter would not need to ask OSHA to mandate that requirement. Even after nearly a decade following OSHA's consideration of that point in the 2010 rulemaking, the prominent accrediting bodies that accredit the four major crane certification organizations have not imposed this approach. OSHA continues to rely on the accreditation process to determine whether, based on analytics and careful scientific study of the issue, recertification requires a prescribed number of hours gaining experience with the equipment. If the accrediting bodies determine it is necessary, then they will presumably require the certification organizations to

include it as part of their testing criteria. The agency believes there is insufficient evidence in the record to support such a new requirement, especially one that may be very onerous on crane operators who may not have the opportunity to gain 1,000 hours experience with the equipment.

Another commenter recommended language that would allow a minimum number of hours of crane experience to substitute for the practical recertification test, also citing the 1,000 hours of "industry experience" as a threshold accredited testing organizations accept in place of retaking the practical test (ID-1719). The commenter also cites state laws that require recertification, but those requirements vary vastly. For example, while California requires operators to recertify every five years and have 1,000 hours operating experience on the crane for which recertification is sought, Washington only requires that a certification be renewed to ensure operators maintain qualified operator status (ID-1719). Similarly, a different commenter opposed a recertification requirement because "if an operator has been operating safely for five years, there is no need to recertify" (ID-1615). The commenter continued, stating "most employers provide their operators with updates on new equipment and changes to government regulations" (ID-1615).

OSHA is not persuaded that merely gaining "industry experience" for a certain number of hours, without any true measure of the safety of operation during that period, or operating "safely" for five years, should replace a third-party validation of the operator's knowledge, skills, and abilities. Besides the vagaries of "crane experience" and "industry experience" already noted in response to the prior commenter, as well as the subjective nature of "operating safely," OSHA notes the previously discussed comments from the certification organization about the importance of staying abreast of "ever-evolving technological changes in newly-manufactured cranes and periodic regulatory changes," as well as the 3,755 certified operators who failed their recertification exams but would otherwise have been legally able to continue operating cranes (ID-1755). Even if "most" employers do actually provide their operators with updates on equipment and changes in regulations, it is not clear that the operators comprehend those changes, and it does not take into account the operators who are not fortunate enough to work for employers that provide these updates. The fact that an operator has logged

1,000 hours or five years in the cab of a crane, even without injury, does not mean that the operator is aware of technological and regulatory changes that have occurred during that period, that the operator has operated without near misses or other issues, or that the next hazard the operator faces will not result in injury.

Another commenter urged removal of the recertification requirement, stating that recertification is unnecessary because it is duplicative of the refresher training provided to crane operators at regular intervals in their industry (ID-1631). As OSHA explained in the 2010 rulemaking, "the rulemaking record shows that a training requirement alone is insufficient to ensure that crane operators have the requisite level of competence," and cannot substitute for third-party validation of the operator's comprehension of that training (75 FR 48013).

OSHA agrees with the comments submitted in support of retaining the recertification requirement. As the agency has previously concluded, certification is a necessary component for safe crane operation. Recertification establishes a standardized, baseline knowledge of equipment operation for operators and indicates to an employer that a certified operator has at least a certain knowledge of how to operate a crane. Recertification helps to ensure that an operator does not lose this baseline knowledge over time. It also helps to ensure continuing education for certified operators so they are aware of any regulatory changes that impact their work. The agency believes there are some employers that would find it difficult to make sure their operators are up to date on changes to equipment and updates to regulations that affect their operation unless they had the ability to have their operators recertified. Therefore, OSHA is retaining the requirement for recertification as proposed.

Paragraph (e) Audited Employer Program

The substantive content of paragraph (e) is the same as previous § 1926.1427(c), and it is promulgated as proposed. It sets out the parameters for a nonportable certification program administered by the employer and audited by a third party. The changes to the regulatory text for the audited employer program are the removal of the word "qualification" and the replacement of three cross references with updated references to their new locations in the revised standard.

OSHA has removed reference to "qualification" from the heading of the

paragraph. It has been removed to avoid the misconception by some that the term signaled full competency, rather than its intended meaning as an equivalent to certification. The employer-audited program will continue to be an alternative to certification by an independent third party.

Three cross references have also been changed. First, the reference in previous § 1926.1427(c)(1)(i) to "paragraph (b)" was revised to "paragraph (d)" in the updated rule. Second, the reference in previous § 1926.1427(c)(1)(ii)(A) to "paragraph (b)" was revised to "paragraph (d)." Finally, the reference in previous § 1926.1427(c)(4) to "paragraphs (c)(1) and (2)" was revised to "paragraphs (e)(1) and (2)." OSHA did not receive any comments to the proposed changes to this paragraph.²²

Finally, in § 1926.1427(e)(5), OSHA explains what an employer must do in the event an auditor discovers a significant deficiency in an employer's operator qualification program. OSHA considers a significant deficiency anything that would result in an employer-audited program being noncompliant. For example, failure to meet requirements listed in § 1926.1427(e)(1)-(4) would result in a

²² OSHA received one comment asking the agency to make the audited employer program "more feasible," by "expanding" its definition of 'auditor' so that more accredited auditing organizations are available as resources to meet the requirements of this option," even asking OSHA to designate staff to audit employer programs (ID-1647). The commenter asserted that OSHA's standard requires an audited employer program to use tests developed by an accredited crane operator testing organization and to obtain approval from an auditor certified by an accredited crane operator testing organization to evaluate these tests. The commenter stated that this creates "a conflict of interest for the crane operator testing organization to the detriment of the audited employer program option. As long as all auditing must go through one of these three organizations, there is little incentive for them to approve or audit an employer program since such auditing would remove certification candidates from their own programs" (ID-1647).

In the NPRM, OSHA explained that it was proposing only minimal changes to the audited-employer program provisions—the removal of "qualification" and the updating of cross-references—and requested commented on the "proposed variations from the existing § 1926.1427(c)." The comment discussed above is not responsive to that request because its suggestion is outside the scope of the proposed variations from existing § 1926.1427(c). Furthermore, OSHA proposed and finalized this requirement in the 2010 cranes standard based largely on C-DAC's recommendation "that independent, third-party involvement was needed to ensure the reliability and integrity of any testing program." (75 FR 48020). Relying on the written and practical tests developed by an accredited crane operating testing organization or an auditor's approval that these tests meet industry recognized criteria ensures that operators certified under this section have the baseline knowledge of safe crane operation.

significant deficiency that would trigger the requirements in § 1926.1427(e)(5).

Paragraph (f) Evaluation

Paragraph (f) sets out specific requirements that employers must follow to conduct an operator evaluation, including evaluation criteria, minimum qualifications for the person conducting the evaluation, documentation, and re-evaluation requirements.

The rationale for the evaluation requirement is explained earlier in the "Need for a Rule" section of this preamble; the discussion here focuses on OSHA's rationale for when and how the evaluations will be conducted. OSHA's goal in paragraph (f) is to give employers flexibility to conduct evaluations in the course of normal business, but at the same time to provide enough specificity to ensure that an evaluation satisfies the minimum criteria necessary for the safe operation of cranes by operators.

Paragraph (f)(1) requires employers to evaluate their operators and specifies the two goals of the evaluation: Ensure that the operator has (1) the ability to safely perform the assigned work, and (2) the necessary skills, knowledge, and ability to recognize and avert risks in order to safely operate the actual equipment that will be used. These performance-based evaluations are intended to be more directly focused on the operator's ability to perform assigned work than the general knowledge and skills tested during the certification process. In paragraph (f)(1)(i), OSHA provides a list of performance-based criteria to ensure that the evaluation encompasses various aspects of the equipment, such as safety devices, operational aids, software, and the size and configuration of the equipment. Paragraph (f)(1)(ii) focuses on the importance of the operator's ability to perform specific tasks, such as blind lifts, personnel hoisting, and multi-crane lifts.

In developing the performance-based evaluation criteria, OSHA considered the training requirements in the powered industrial truck operator training standard at subpart O—Motor Vehicles, Mechanized Equipment, and Marine Operations, § 1926.602(d), which incorporates the requirements of § 1910.178(l). That standard requires the employer to evaluate a powered industrial truck operator's performance as it relates to several topics at least once every three years. Powered industrial trucks share many of the same operating hazards as cranes, such as those related to ground conditions, load limits, and hazards in the area

surrounding the equipment. But powered industrial trucks are generally far less complex, smaller, and less hazardous pieces of equipment in terms of the extent to which they expose other employees to their risks.

Almost all employers who spoke with OSHA said that, when they observe operators handling loads at construction worksites, they can tell whether the operators appear competent (Reports #1, 2, 3, 6, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 22, 23, 26, 27, 28 of ID-0673). These employers are accustomed to assessing operator skills because having competent operators that can safely and productively handle loads quickly, smoothly, and without corrections, eliminates injuries and reduces costs.

A number of commenters provided suggestions about the language of the evaluation requirement in § 1926.1427(f). Commenters expressed support for providing flexibility for employers, as opposed to trying to specify a definitive list of evaluation criteria in the regulatory text. As OSHA explained in the NPRM, it would be very difficult, if not impossible, to specify in regulatory text a definitive list of minimum equipment characteristics that an operator competency evaluation must cover to ensure operators are competent to safely operate equipment in all of its possible configurations. However, there was significant disagreement among commenters about the extent of the flexibility and guidance that OSHA should provide.

Three industry associations supported the language proposed by OSHA. One of these commenters found the proposed language "sufficiently flexible" because it contains phrases such as "includes but is not limited to" and "including, if applicable" (ID-1611). A different commenter praised OSHA's proposed text and urged the agency to "maintain this flexibility in the final rule so that employers have the ability to continue their existing programs or craft new programs that meet the needs of their company's workplace" (ID-1735). Another of those commenters appreciated the fact that the language is "general and not exhaustive" because "[a]ny attempt to develop an exhaustive list of factors runs the risk of including factors that are not relevant, leaving out factors that are important, and 'freezing' the list in time requiring a rulemaking process to update the list as technology develops and industry practice changes . . . the employer should have the discretion to develop its own list of factors affecting an operator's ability to safely operate equipment" (ID-1779).

AGC of Texas (ID-1615), expressed concern that OSHA's proposed language would require too many evaluations:

As written this requirement is infeasible. Cranes have multiple configurations (counterweight, attachments, boom configurations etc.) as well as capacities based on those and the radius of any given lift. It is not possible to evaluate an operator on each potential configuration that could be encountered throughout the day. Set up/configuration will vary dependent on the work involved and will be job specific so this will vary from job to job. Rarely if ever would the required components for every possible configuration of any given crane be available on a job . . . The (f) Evaluation section of the rule as written makes it nearly impossible for an employer to evaluate operators on each machine and it's [sic] many different capacities and configurations prior to any given lift in a timely and efficient manner.

OSHA understands the concern about an excessive number of evaluations, but the agency disagrees that its revised standard would require the frequency of evaluation suggested by the commenter. For example, the standard does not require operators to be evaluated on "every possible configuration of any given crane." Later in this preamble section OSHA provides additional guidance about when evaluations are required, and when they are not.

Associated General Contractors (AGC, ID 1801) expressed its preference for retaining the existing language in § 1926.1427(k). The Specialized Carriers & Rigging Association (SC&RA) agreed, asserting that "[t]here is no supporting evidence indicating employers are not fulfilling their obligations to train and evaluate their operators for the cranes to which they are assigned. As such, there is no need for further clarification, requirements or language" (ID-1828). SC&RA went on to advocate for slightly different language (see the discussion of the ACCSH proposal in the next paragraphs).

As OSHA explained in the NPRM, the agency does not agree that the employer duty under prior § 1926.1427(k) provided sufficient direction to employers. That language was intended originally only as a temporary measure to preserve the pre-2010 status quo pending the application of the certification requirement and was drawn from the language in § 1926.20(b)(4) ("The employer shall permit only those employees qualified by training or experience to operate equipment and machinery"). Part of the genesis for the 2010 final rule was that OSHA had concerns about relying primarily on the general guidance in § 1926.20(b)(4) rather than more clearly defined measures specific to crane operators, noting that C-DAC had

implicitly deemed it insufficient for operator safety by recommending a new standard.

The Coalition for Crane Operator Safety (ID-1744), a group of national labor, construction management, equipment manufacturers and distributors, insurance underwriters and accredited certification organizations, and two of its members writing separately (Specialized Carriers & Rigging Association, ID 1828 and William Smith, ID 1623), as well as the North America's Building Trades Union (ID-1768), advocated for OSHA to adopt ACCSH-recommended language. ACCSH recommended that OSHA replace the entire evaluation requirement with an employer duty to "ensure that operators of equipment covered by this standard meet the definition of a qualified person in § 1926.1401 to operate the equipment safely." These commenters did not respond, however, to OSHA's explanation in the NPRM (83 FR 23556) that this approach would fail to accomplish the purpose of additional evaluation beyond certification. Relying on the definition of a "qualified person," which can be met in some cases solely through "possession of a . . . certificate," would return the standard to the inadequate "certification only" approach that prompted the same commenters to urge OSHA to propose the permanent employer evaluation duty in the first place (ID-0670). Under this approach, an operator would become both certified and a "qualified person" through the completion of a certification test. Nor did the commenters respond to OSHA's explanation that the ACCSH language fails to provide employers with "sufficient specifics to ensure operator competence," including the "specific step[s]" that an employer must take to "qualify" operators.

Mr. Smith also expressed concern that the evaluation OSHA proposed "is flawed because there are no standards for the industry to follow in the evaluation therefore each evaluator will do it differently. The results will be ambiguous at best because there is no baseline to consider for qualifications" (ID-1623). OSHA recognizes that employer evaluations may not be uniform. That is the tradeoff for allowing the flexibility that OSHA has allowed employers in the standard. However, OSHA expects that the criteria it has included in the regulatory text, as well as the examples it provides in this preamble, will provide meaningful markers for effective evaluations to ensure safety. OSHA also notes that this commenter's concern about insufficient

specification of criteria in the regulatory text supports, rather than contradicts, OSHA's decision not to adopt the more simplified regulatory text proposed by ACCSH that he recommends.

AGC (ID-1801) offered alternative regulatory text that modified and combined paragraphs (f)(1)(i) and (ii) into a single paragraph (f)(1) stating, "Through an evaluation, the employer must ensure that each operator demonstrates the skills, knowledge, and ability necessary to operate the equipment safely for the assigned work or task."

While OSHA views this approach as more workable than relying on the definition of a "qualified person" because it retains the goals of the evaluation, the agency is concerned that this alternative still lacks the level of specificity necessary to provide effective guidance to employers.

One local chapter of a member of the Crane Safety Coalition, the International Union of Operating Engineers (IUOE Local 49) (ID-1719), provided a separate comment that included a different alternative that OSHA believes would be a better bridge between the ACCSH proposal and OSHA's proposed text. In its comment, IUOE acknowledged OSHA's prior rationale for rejecting the "qualified person" approach and responded with a combination of the ACCSH recommendation and OSHA's proposed text:

- Evaluation. Through an evaluation, the employer must ensure that each operator is qualified by a demonstration of: * * * [The skills, knowledge, and the ability to recognize and avert risk necessary to operate the equipment safely, including The ability to perform the hoisting activities required for assigned work, including]

This alternative is similar to the ACCSH recommendation because it still contains the requirement that the operator be qualified, but avoids OSHA's concern about relying on the term "qualified person" with a requirement to ensure that "each operator is qualified by a demonstration of" OSHA is adopting this compromise language in the final rule because it incorporates part of the language recommended by ACCSH while still preserving the criteria that provides guidance to employers. OSHA notes that while "qualified" is not defined in the cranes standard, there is a definition of that term in § 1926.32 that applies generally to construction and that definition also equates the possession of a certificate with being "qualified." OSHA is therefore adding a new paragraph § 1926.1427(f)(3) to clarify that the definition of "qualified" in § 1926.32 does not apply to

§ 1926.1427(f). Unlike the ACCSH recommendation that relied on the definition of "qualified person" in § 1401 for its substance, the use of "qualified by a demonstration of" does not necessitate a separate definition of "qualified" because the remainder of paragraph (f)(1) provides a functional definition.

IUOE's alternative also eliminates the requirement to evaluate the operator's "judgment" and as a result helps to address the following objection raised by AGC concerning the term (ID-1801):

First, the term is not used in any other OSHA standard or requirement that we are aware of. * * * Second, an operator's proper judgement is almost impossible to discern during the evaluation process and there are a variety of factors that could impair an individual's judgement which are unrelated to their assigned work and operational ability. Lastly, this could be a catch-all in the event of an incident as an operator's judgement could always be cited as a factor.

The American Public Power Association shared similar concerns:

As a practical matter, employers will be evaluating operator judgement when the evaluation is taking place. However, we are concerned that the term "judgment" if contained in the Final Rule will lead to unintended consequences, especially in an enforcement context.

(ID-1779). The Associated General Contractors of Texas (AGC of Texas), commenting separately, suggested that OSHA replace judgment with "competence," which would include the "authorization to take prompt corrective measures" (ID-1615).

In the earlier quotation of the IUOE text, "judgment" was replaced with "ability to recognize and avert risk." OSHA has adopted this change in the final rule. This approach focuses on one part of the definition of judgment previously identified by OSHA. In the NPRM, OSHA explained that "judgment" referred to not only an operator's ability to apply the knowledge and skill that he or she possess, but also "an operator's ability to recognize risky or unusual conditions that call for additional action such as re-evaluating a lift plan, stopping work, or asking for the help of another competent and/or qualified person" (83 FR 23550). OSHA had also explained that the term "judgment" connotes the "successfully demonstrated ability" of a "qualified person," as defined by OSHA's standards in § 1926.1401, "to solve/resolve problems relating to the subject matter, the work, or the project" and the capability of a "competent person" to identify "previous and predictable hazards" (Id.). OSHA is implementing this language instead of referring to a

“competent person” because that term is used elsewhere in the standard and for this purpose OSHA prefers the emphasis on the ability of an operator to identify and avert risk rather than focusing on his or her authority.

Adopting IUOE’s more focused version of this component of the evaluation also addresses AGC’s point that employers may have difficulty examining an operator’s judgment on a wide variety of subjects during the evaluation process. During an evaluation, the operator must demonstrate his or her ability to recognize and avert risks.

For example when operating a floating crane, an experienced operator should recognize that a change in tidal ranges could affect the boom angles at which work must be performed, potentially affecting the safety of hoisting operations during particular times of day. Another example is when an operator appropriately recognizes that a different crane will be needed because the ground conditions at a particular jobsite prevent him or her from setting up the current crane at the only locations where picks with that crane would be safe. A knowledgeable operator would also know that even though the current crane can boom out sufficiently from an alternate set-up position, the weight of the loads will easily exceed that permitted by the load chart at that boom length and radius. Another crane will be needed for that job if the alternate set-up area must be used. Another example of an operator’s ability to recognize and avert risk would be when an operator knows to consider the wind speed and direction when determining where on the jobsite air turbulence is likely and may torque broad loads, making them more unstable. An experienced operator can also demonstrate the ability to recognize and avert risk by engaging site authorities, such as the project manager, site supervisor, or project engineer, during the planning of the project’s progression. It is then that the operator can recommend plans for utilizing the crane more efficiently and making safer picks, such as those that are in plain view, not adjacent to power lines, and not over people or other structures.

One commenter requested that OSHA replace the employer’s duty to “ensure” that the operator possesses the requisite skills, knowledge, and ability to recognize and avert risk with a simpler duty “to take reasonable measures to evaluate operators’ ability to operate equipment in a safe manner” (ID-1779). OSHA is not adopting this change for two reasons. First, OSHA views this reduced duty as an unnecessary and

significant departure from OSHA’s common practice of requiring employers “to ensure” compliance with performance standards. OSHA notes, for example, that 29 CFR 1926.1400(f) includes a similar mandate in the scope of the cranes standard, requiring employers to establish, communicate, and enforce work rules “to ensure compliance with such provisions.” Similarly in § 1926.1402(c)(1), OSHA requires controlling entities to “ensure that ground preparations necessary to meet the requirements” of the standard are met. For crane assembly and disassembly near power lines, OSHA provides one compliance option in which employers must “ensure” that no part of the equipment, load line or load gets closer than 20 feet to a power line (§ 1926.1407(a)(2)).

Second, OSHA is concerned that the suggested language would be so vague as to potentially render the entire duty ineffective and unenforceable. Employers might, for example, perceive a requirement to “take reasonable measures to evaluate” operators as requiring no more than appointing an evaluator. Because OSHA has framed the evaluation requirement as a flexible performance measure as requested by stakeholders and commenters, it is particularly important that the employer have a duty to satisfy the performance requirement, not just take steps towards doing so.

For the reasons identified in the previous discussion, the revised rule retains the performance-based character of the previous evaluation requirements in § 1926.1427(k)(2)(i), but makes clear that the operator must possess the necessary skills and knowledge to operate “the equipment” safely, as well as the ability to recognize and avert risk in order to operate the equipment safely. Those skills, knowledge, and abilities must be relevant to the actual equipment that will be operated. While the specifications and characteristics of equipment and operations can be learned in a classroom setting, the application of equipment operation and hoisting techniques can only be fully learned from hands-on experience at worksites. For example, the operator must not only know what each control does and where it is located, but also be able to demonstrate how and when to use particular controls or operational aids.

Much of the subject matter on which the operators must be evaluated is specified in the testing criteria listed in paragraph (j), but it is critical to ensuring safety that the employer evaluation is equipment- and task-specific. For example, an experienced

and certified operator may have previously demonstrated the ability to lift a crate of materials onto a roof using one crane. However, if the company gets a new crane that has different controls, the employer would need to evaluate the operator’s knowledge and skill at using the new controls in the new crane (note that the employer would not need to re-evaluate the operator’s general knowledge about crane operations). The employer’s evaluation could focus exclusively on the operator’s familiarity with the controls in their different locations. As another example, if an inexperienced operator has already been evaluated for operation of a new model of crane, but has only used that equipment to hoist packaged materials, the employer would likely need to evaluate the operator’s ability to control a wrecking ball attachment before allowing that operator to use the wrecking ball in a demolition project (note that the employer would not need to re-evaluate that operator’s knowledge of the controls or general operation of the crane).

A commenter from the insurance industry expressed concern about the impact of the rule on employers that work in the Petro Chemical and Refinery industries who use Union halls to “ramp up when 30 to 75 crane operators are needed for a shut/down turnaround on a 30 day period.” These employers would, the commenter asserted, “have to evaluate and set up every crane to be used in the refinery and evaluate each newly hired operator prior to the job and before letting them work in the plant” (ID-1623). OSHA disagrees. An operator could be evaluated on a single crane and then allowed to operate other equipment that do not require substantially different skills, knowledge, or abilities to identify and avert risk. OSHA also notes that the American Fuel & Petrochemical Manufacturers, which describes itself as “a national trade association comprising virtually all U.S. refining and petrochemical manufacturing capacity,” also submitted comments on the rule but did not raise similar concerns about the evaluation requirements (ID-1628). Neither comment explained how the use of cranes at refineries and petrochemical plants would constitute construction work.

Stakeholders who spoke with OSHA said that most employers are already able to determine the subject matter and crane knowledge that their operators need to safely perform hoisting activities with their cranes (Reports #2, 3, 4, 9, 11, 15, 18, 21, 26, 28 of ID-0673). However, not all employers do so. OSHA’s requirements should encourage

consistency throughout the industry in confirming the basic knowledge, operating skills, and abilities of all operators in construction work, as well as ensure that all operator evaluations cover subject matter that is specific to the equipment used and the construction activities performed.

Paragraph (f)(1)(i) also specifies that the operator's knowledge, skills, and ability to identify and avert risk must be "specific to the safety devices, operational aids, software, and the size and configuration of the equipment." This list of equipment characteristics, which stakeholders identified as critical for safe operation (Reports #1, 4, 5, 6, 10, 11, 18, 19, 20, 21, and 25 of ID-0673), is not comprehensive, but provides employers with some basic characteristics of equipment that might require different levels of knowledge and operating skills. For example, the employer must verify that the operator knows enough about how the safety devices, operational aids, and software work on a particular crane. The operator must be able to apply that knowledge to recognize when the particular characteristics of the equipment may contribute to potentially unsafe conditions or operations and to determine how to proceed safely. Such a determination might include using particular operating skills to safely land or maintain a suspended load if an operational aid malfunctions during use, or simply refusing to hoist the load until a safety issue is addressed.

OSHA is including equipment software in this list because many stakeholders noted that operators must have the skills to use a computerized operating system if the crane has one (Reports #2, 4, 18, 21 of ID-0673) and that specific operating systems (Reports #4, 9, 13, 18, 19, 21, 22, 24 of ID-0673) or cranes by different manufacturers (Reports #4, 6, 13, 16, 18, 21, 24 of ID-0673) can require different skills or knowledge. Indeed, newer cranes often have integrated computer systems to protect workers and the crane. Operators must understand how these systems prevent damage to the crane that could impair safe operation of the crane, especially if the crane can be operated with the system turned off. That is not the only issue with newer cranes that may require evaluation. One construction company that also provides crane operator training noted that the materials used to make some new cranes can be more "brittle," meaning that they have reduced safety factors and allow for less room for error (Report #21 of ID-0673). Exceeding these operating tolerances can lead to structural equipment failure such as a

crane collapse or tipover, so evaluating operators is critical to ensure that they understand how to avoid exceeding specified tolerances.

OSHA is including boom length in the list of characteristics because longer booms may require specialized depth perception skills or may be harder to control (Reports #2, 3, 22 of ID-0673). OSHA notes that at least one certification testing organization uses different boom lengths as a proxy for changing the capacity of the crane because the boom length can have a significant impact on the performance of the crane (see OSHA-2007-0066-0521, p. 268-69).

The stakeholders OSHA interviewed also identified crane configurations (Reports #4, 6, 11, 18, 19, 20, 21, 22, 25 of ID-0673); the use of attachments (Reports #6, 18, 19, 20 of ID-0673); and the use specific safety devices and operational aids such as those listed in § 1926.1416 *Operational aids* (Report #21 of ID-0673) as important crane characteristics that can require unique skills, knowledge, or the ability to recognize and avert risks.

In proposed paragraph § 1926.1427(f)(1)(i) (83 FR 23568), OSHA specified that the "size and configuration" of cranes, including lifting capacity, as well as boom length, attachments, use of a luffing jib, and counterweight set up, are important considerations in the safe operation of cranes. AGC of Texas specifically objected to the inclusion of "lifting capacity" in the listed evaluation criteria, noting that the capacity of a crane changes nearly every time an operator makes a lift because there are so many factors that affect the determination of what the capacity of the crane will include: The configurations of the crane (counterweight, attachments, boom configurations, etc.), radius, boom length, and boom angle. AGC of Texas wrote:

It is not possible to evaluate an operator on each potential configuration that could be encountered throughout the day. Set up/configuration will vary dependent on the work involved and will be job specific so this will vary from job to job. Rarely if ever would the required components for every possible configuration of any given crane be available on a job. E.G >500-ton lattice boom crane that has a max boom length of 200' may be configured for 100 feet of boom and enough counterweight to have 375 tons of capacity as that is all that is required for the scope or scopes of work involved. The components (boom and additional counterweight etc.) necessary to configure the crane for a 500-ton capacity and 200 feet of boom would not be available * * * Capacity is a function of many factors and not actual operation of the

crane. Its effect on safe operation is taken into account with proper lift planning.

(ID-1615). That commenter suggested that if removal of "lifting capacity" was not possible, then OSHA should substitute: "The ability to determine capacity based on the configuration of the crane, the load, and deductions as required by the manufacturer." William Smith appeared to disagree, stating: "The capacity issue is mute [sic] since there is no requirement for a load to be placed on the crane" (ID-1623).

OSHA has retained the language that lifting capacity is a component of "size and configuration" to be assessed during an evaluation. In response to removing the capacity from the certification requirement, some stakeholders explained that capacity as it relates to crane operation is better assessed by the employer (Report #20 of ID-0673, ID-1735, 1755). The revised rule does not require employers to evaluate their operators in every possible configuration of equipment or combination of configuration and boom length, etc., that would factor into a crane's capacity. Additional evaluations are only required when the operator's existing skills, knowledge, or ability to identify and avert risk are not sufficient for that operator to operate the equipment in a new model, configuration, etc.

OSHA requested comment on items listed in paragraph (f)(1)(i). Besides the objection to the inclusion of "lifting capacity," one commenter suggested a different approach:

A performance-based assessment of an operator's ability to inspect (operational not detailed mechanical) and set up the crane for operation (to include the LMI); to utilize the manuals/load charts for determining capacities and to operate/handle a load, as well as a "seat test" to determine safe operating capabilities is all that is needed to evaluate an operator.

(ID-1615). While OSHA had previously rejected requests that the agency include minimum seat hours in the standard, OSHA expects that some "seat test" time is implicit in the items already listed in paragraph (f)(1). Similarly, the ability to utilize the manual and load chart is required for certification, and the use of a particular manual or chart is inherent in possessing the skills and knowledge to operate a particular piece of equipment safely. As discussed in the NPRM, OSHA is not including specific references to assembly and disassembly or inspections because those are already addressed in other sections of subpart CC. Operators may not be assigned to perform these activities unless they are trained to safely perform activities in

accordance with the applicable sections of subpart CC.

The lists in paragraphs (f)(1)(i) and (ii) are not exhaustive, so in addition to the items listed there, employers must consider still other differences that may be important to the safe operation of the equipment. For example, an operator who previously demonstrated competence in operating a small crane to hoist materials to and off of buildings being demolished does not necessarily have the knowledge and operating skills needed to safely swing a wrecking ball to demolish the same building. The physics of swinging a wrecking ball into a building, which can lead to equipment failure due to side loading or shock loading the boom, are different from smoothly controlling a load, which does not present these hazards. Similarly, an operator who has operated a crane in support of pile driving work, using pile driving attachments, does not necessarily have the skills necessary to smoothly control and place steel members suspended by multi-lift rigging or to safely control a suspended personnel platform.

Paragraph (f)(1)(ii) requires the employer to evaluate the operator's ability to perform hoisting activities required for assigned work, including, if applicable, special skills needed for activities like blind lifts, personnel hoisting, or lifts involving more than one crane. This list of activities is not exclusive, but rather provides examples of lifts for which an employer must evaluate the operator's ability. The words "if applicable" are used to indicate that employers must evaluate operators only for the types of lifts they will perform and not all possible variants of hoisting procedures.

As noted earlier, OSHA considered the training requirements of the powered industrial truck standard (§ 1910.178(l)) as a model when developing the evaluation requirements in the proposed standard. The powered industrial truck standard requires that employers evaluate an operator's ability to perform job-specific tasks that include "workplace-related topics," and refresher training when there are changes in a workplace condition that could affect safe operation of the truck (§ 1910.178(l)). Paragraph (f)(1)(ii) similarly requires the evaluation of an operator to cover the workplace aspects of the operator's job, including the specific hoisting activities that he or she will perform.

Stakeholders who spoke with OSHA asserted that the performance of different types of work sometimes requires different skill sets. Many employers currently evaluate their

operators based not only on their knowledge and skills regarding specific characteristics of the equipment, but also on their operators' ability to perform specific tasks with the equipment (Reports #1, 2, 3, 4, 6, 9, 10, 13, 15, 16, 18, 19, 20, 21, 22, 23, 26 of ID-0673). Several of those stakeholders noted specific examples of operational challenges that may require additional operator skills to ensure safe operations. One crane rental company stated that if an operator who spends a year on a large project with repetitive work is then moved to a different job that involves different lifts and set-ups every day, that individual may not be competent to do some of that kind of work (Report #6 of ID-0673). A residential construction employer stated that residential jobs can be especially challenging to crane operators because lifts may have to be performed on previously disturbed soil, which can cause the cranes to lose stability and may necessitate special preparations and operations under some worksite conditions. However, this employer also said that residential construction crane operators might not gain necessary experience performing blind lifts or lifting heavy/unstable loads that may be typical to operating a crane on commercial projects (Report #16 of ID-0673). A larger construction employer stated that it includes job-specific components in its evaluation of operators to ensure that operators have the ability to work on/around underground utilities and power lines (Report #18 of ID-0673). Finally, a crane operator training company noted that operators may require significant practice to develop the ability to control a dragline or perform operations with a clamshell or bucket attachment (Report #20 of ID-0673).

OSHA requested comment on all aspects of proposed paragraph (f)(1)(ii). One commenter requested clarification on the requirement to evaluate the "ability to perform hoisting activities required for assigned work:"

The terms task-specific and assigned tasks, in our opinion, can potentially be interpreted to mean jobsite-specific training. If this is the intent, compliance with this proposed provision would be very onerous as operators may encounter jobsite conditions that are similar but not identical to the conditions for which they have been previously trained. In addition to the jobsite conditions being different, the loads which may be required to be hoisted may also be different. For example, a tower crane operator on a building project may lift materials and loads ranging from bundles of steel to bundles of plywood. * * * operators can be required to hoist a variety of materials and perform various lifts for the project such as hoisting

concrete buckets or formwork, conducting blind picks, or picks below grade.

(ID-1801). As discussed earlier, the standard does not require separate evaluations for every conceivable difference in equipment or task. OSHA's intent is that the employer identify the substantive differences that require new skills, knowledge, or abilities that the operator has not already demonstrated during a previous evaluation. The standard does not require a new evaluation of the same tasks at a different jobsite unless the new jobsite requires the operator to have new skills, knowledge, or abilities. Absent special circumstances (very long pieces that would change the dynamics of a lift, significantly different bundling methods, etc.), OSHA expects that a certified tower crane operator who has been evaluated lifting a bundle of steel would also be qualified to lift a bundle of plywood. The employer would not need to re-evaluate the operator because lifting a bundle of lumber does not require any significant new skill, knowledge, or ability that the operator had not already demonstrated by lifting a bundle of steel.

OSHA did not receive any other comments specifically addressing paragraph (f)(1)(ii) (other than the requests for broad revisions of (f)(1) discussed earlier) and is promulgating that paragraph as proposed.

OSHA is adding a new paragraph (f)(2), which was not in the proposal, in response to several commenters raising concerns about the process of evaluating experienced operators during the transition period as the new evaluation and documentation requirements in the final rule take effect. Several commenters (ID-1623 and ID-1828) suggested "grandfathering" (exempting) currently certified operators from the evaluation requirements. One of these commenters explained:

The challenge for the industry is that operators working for the same or several employers that have 15, 20, 25, even 30 years in the business and every crane that they have operated has not been documented. This is the impracticable and infeasible part of the rule where a Grandfather Clause may be required for all currently certified operators and any new operator entering the industry after the date of enforcement goes through a documentation process to move forward and make sense of the rule.

(ID-1828). While the comment focuses on the documentation aspect of the new rule (see later discussion of § 1926.1427(f)(6)), the comment also raises the question whether employers will need to re-evaluate every operator. Under the new language in § 1926.1427(f)(2), the answer is "no."

For operators already employed by an employer, paragraph (f)(2) allows that employer to rely on its "previous assessments of the operator in lieu of conducting a new evaluation" of that operator. OSHA's final rule does not require employers to make each existing operator re-sit for formal re-evaluations on all applicable equipment and perform different tasks when the employer has already previously assessed that operator prior to the effective date of the rule and determined that he or she is qualified to safely operate such equipment for certain tasks.

Several terms may require additional explanation. For the purposes of § 1926.1427(f)(2), an "operator" encompasses anyone who has been operating equipment covered by this subpart, including operators in training, such that the employer has had an opportunity to assess the operator's performance on the relevant equipment and tasks and has determined the operator can safely perform on those equipment and tasks. The reference to "its previous assessments" is intended to ensure that the operator was previously assessed, even if that assessment was not previously documented in accordance with new § 1926.1427(f)(6), and that the operator's employer (or its agent) conducted the assessment. The employer cannot rely on recommendations or evaluations from a previous employer. It is important that the employer have its own factual basis for its determination that the operator has the skills, knowledge, and ability to identify and avert risk necessary to operate particular equipment safely for particular tasks. But that factual basis does not require a previous formal evaluation by the employer's current evaluator. For example, the current evaluator might not have observed an operator's previous 25 years of work. In such a case, the employer would satisfy the requirements of paragraph (f)(2) if it noted that the operator had operated specified equipment safely for that employer. OSHA has provided a corresponding exception in the documentation requirements of § 1926.1427(f)(6), which is discussed later in this preamble.

OSHA prefers this approach to any "grandfather" approach that would completely exempt existing operators from all evaluation. Such an exemption would not accomplish the purpose of providing a baseline of operator qualification against which an employer could compare future equipment and assignments to determine if they require new skills, knowledge, or the ability to

identify and avert risks. Furthermore, completely exempting existing operators from all evaluation would not achieve a primary objective of the rulemaking: With respect to future assignments, there would be no employer duty to ensure that these operators have the skills, knowledge, and ability to safely operate assigned equipment for assigned tasks in a variety of contexts. Such an exemption would be a step backwards from the prior temporary employer duty in § 1926.1427(k), which did not provide any exemption for previously employed operators.

Paragraph (f)(4) establishes minimum criteria for the person who performs the required evaluation of an operator-in-training. The evaluation must be conducted by an individual who possesses the knowledge, training, and experience necessary to assess operators. This standard affords some flexibility to employers as they seek to ensure operator safety. An evaluator could be, for example, a current or former operator who is also trained to assess equipment operators. The key, however, much like the criteria for the person performing training and evaluation of operators under the powered industrial truck operator training standard (§ 1910.178(1)(2)(iii)), is that the evaluator possess the requisite knowledge, training, and experience for assessing an operator's knowledge, skill, and ability to recognize and avert risk. Such knowledge, training, and experience is not necessarily the same as the knowledge, training, and experience to perform the particular construction operations or processes oneself.

Stakeholders spoke with OSHA at site visits and meetings about how they comply with the employer duty described in § 1926.1427(k)(2)(i) in the prior standard. Several of those companies specifically employ individuals to assess operators (Reports #18, 22 of ID-0673). A large construction company with a very robust and formal evaluation process has "Authorized Examiners" who perform evaluations of operator applicants for the company. These are personnel with significant experience and training, including completion of crane operator certification and rigger courses (Report #18 of ID-0673). In many other cases, the evaluations are performed by other personnel such as experienced riggers, maintenance personnel, signal personnel, or tradesmen who have demonstrated the necessary experience or training to conduct this assessment (Reports #1, 2, 3, 6, 15, 16, 20, 23 of ID-0673). Day-to-day assessment of an operator's

performance may be conducted by a qualified person who is often a manager or foreman at the job site. (Reports #1, 3, 6, 18 of ID-0673). A seasoned operator who has been designated by the employer to mentor an operator-in-training may also make determinations about when an operator-in-training is ready to perform certain tasks, and may weigh in on the evaluation or confirm that an individual is ready to operate without monitoring (see, e.g., Report #2 of ID-0673).

Stakeholders who spoke with OSHA offered competing recommendations about whether OSHA should require that evaluators be certified as operators. Several employers who spoke with OSHA stated that an individual may have the ability to evaluate an operator without being a certified operator (Reports #1, 6, 18, 20, 26 of ID-0673). They indicated that evaluators may be safety managers or other senior employees with significant experience working around cranes, but who might not currently be certified (see, e.g., Reports #1, 6, 18, 26 of ID-0673). Others may be specifically trained to evaluate operators. But at the May 2015 ACCSH meeting, several representatives from the crane industry asserted that evaluators should be certified (OSHA-2015-0002-0036).

Based on information obtained from the stakeholders, OSHA opted in the proposal to maintain employer flexibility in choosing who may perform the required evaluation as long as those evaluators have, or develop, the requisite assessment knowledge and experience. OSHA noted that the national consensus standard for cranes (ASME B30.5-2014 Mobile and Locomotive Cranes, Chapter 5-3) does not require or recommend that evaluators of operators must be certified by third-party testing entities; a "designated" person who qualifies operators must be a qualified person by experience and training but need not be certified (B30.5, section 5-3.1.2(e)). Similarly, previous § 1926.1427(f)(3)(ii) required that the trainer of an operator-in-training must have passed at least the written part of a certification test, but did not require that the trainer must be an operator or certified. Additionally, employers who spoke with OSHA and publicly commented at the March 2015 ACCSH meeting expressed the view that passing the written portion of a certification test alone does not mean an individual has the ability to effectively evaluate the competency of an operator (OSHA-2015-0002-0036). But along with other crane-related experiences, OSHA believes that, if a person has passed the written portion of the

certification test, it should be taken into account when deciding if that person has the knowledge and abilities necessary to evaluate crane operators.

OSHA requested public comments on the proposed criteria, including whether OSHA should require that the evaluator be an operator, have been an operator, or at least have passed the written portion of certification testing. There was disagreement among the commenters on this issue. An insurance company representative expressed the view that evaluators must be both former operators and a trainer in accordance with § 1926.1427(b) (ID-1623). NCCCO proposed certification for operators, or alternatively that evaluators should be required at least to have passed the written part of a certification test and have familiarity with the equipment's controls, consistent with the requirements previously required for trainers under the prior standard (ID-1755). Certification, that commenter explained, "should be regarded as an appropriately necessary condition of establishing such competence and ensuring a 'baseline' of knowledge and skills:"

Requiring that an evaluator have a baseline of knowledge and skills as an operator is likely, not only to improve the quality of evaluations, but also to increase safety during any evaluation in the event the operator-in-training engages in an unsafe act and the evaluator must intervene. Since November 10, 2010, when the crane Rule became effective, no fewer than 685 candidates have been prohibited from continuing with their practical exams after engaging in unsafe acts as recorded by NCCCO Practical Examiners during practical exams. Had the Examiners not also been certified operators, with the training and experience to recognize hazardous and potentially dangerous crane operations, these unsafe acts that might have been allowed to continue, with consequent property damage, personal injury, or worse. (Id.).

Two other commenters disagreed. One commenter urged OSHA to "grant employer flexibility in choosing who may perform the required evaluation" and to "leave the decision as to who may evaluate, and the qualifications of the evaluator, to the employer" because the employer is in a better position to ensure that an operator is competent to complete an assignment safely (ID-1779). Another commenter agreed that the evaluator need not be certified, nor a former operator: "With a clearly defined evaluation process, an individual who is qualified, or competent in crane safety and operation would be able to assess an operator" (ID-1615).

OSHA is not requiring that evaluators must be certified or have previous

experience as an operator. While experience as an operator and certification might be helpful, C-DAC did not recommend either for trainers and OSHA is not requiring it in the final rule because it does not think it is necessary to hold evaluators to a higher standard than C-DAC recommended for trainers. As stated in the NPRM, OSHA heard from stakeholders who have successfully involved a variety of personnel in the evaluation of operators, including riggers, maintenance personnel, signal personnel, tradesmen, managers, and foremen who have demonstrated the necessary experience to conduct this assessment. These personnel are typically not certified to operate cranes (See Reports #1, 2, 3, 6, 15, 16, 18, 20, 23 of ID-0673). Based on the record, OSHA does not wish to prevent these kinds of personnel from performing effective evaluations.

OSHA acknowledges the certification organization's concern about safety during the evaluation (ID-1755), but the agency believes the standard already addresses that concern. An operator-in-training must remain under the supervision of a person who meets the definition of a "trainer," which includes "the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use" (§ 1926.1427(b)(4)(i)(B) (emphasis added)). Because the operator-in-training cannot move out of that status until the completion of an evaluation, a trainer is required at the evaluation if the evaluator does not also meet the definition of a trainer (see later discussion about trainer also serving as evaluator).

As OSHA explained in the NPRM, paragraph (f)(4) will allow employers the flexibility to contract with a third-party agent to conduct evaluations if the employer does not maintain the expertise on staff, or to identify existing staff who may not have operator experience but are capable of conducting an evaluation. OSHA wants to allow employers to continue using effective and safe solutions that they have already identified and are currently in use. For example, OSHA spoke with an employer that took steps to qualify its first operator without having an experienced mentor-operator on staff. This was accomplished by enrolling the operator-in-training in several outside classes, including a crane manufacturer's training and training with the local union, and then arranging for an experienced union operator to mentor the operator-in-training. Later, when the employer hired additional operators-in-training, the first operator, now experienced, was able to

serve as the trainer and evaluator (Report #16 of ID-0673).

A sole proprietor OSHA spoke with followed a similar path when he first started operating cranes for a former employer by seeking out the mentorship of an experienced operator before beginning to operate independently. When the company later hired other operators, this individual trained new operators and supervised them for at least a month before evaluating them (Report #23 of ID-0673).

One commenter suggested that OSHA clarify that it is the employer of the operator who ultimately bears the responsibility for ensuring that the operator is evaluated. The commenter stated "if a crane operator has been made available through a third party and the third party also owns the crane, then [the operator] effectively works for the third party and thus, the third party should be responsible for the evaluation" (ID-1615). A different commenter requested that OSHA add language to paragraph (f)(5) to clarify that an "employer may not relinquish its duties under these paragraphs [by] delegating them to a third-party."

The evaluator must be an employee or agent of the employer. Employers that assign evaluations to an agent retain the duty to ensure that the requirements in paragraph (f) are satisfied.

(ID-1719). While this addition is arguably unnecessary because § 1926.1427(f)(1) includes the introductory text "the employer must ensure," OSHA is adding the commenter's suggested text for clarification and consistency with the requirements for a trainer in § 1926.1427(b)(4)(i)(A). OSHA requires operator trainers to be an "employee or agent of the operator-in-training's employer" (Id.).

Several commenters requested additional guidance regarding evaluators. One commenter asked for clarification about whether a trainer can also serve as the evaluator, expressing support for the idea because the "process of properly training an operator-in-training should not be drastically different from successfully evaluating that same operator" (ID-1801). Another commenter expressed support for trainers to also potentially serve as evaluators, stating that "the employer should use its best judgment in identifying the suitable criteria for evaluator qualifications for the particular task, jobsite, and equipment at use for that employer" (ID-1779). A different commenter opposed allowing a single person to serve in both roles, noting that national accrediting

standards bar the same person from performing both a training role and an evaluation role out of concern that an evaluator may not effectively evaluate of an operator the evaluator had trained:

NCCCO proposes that trainers should be precluded from acting as evaluators within the framework of the Rule. Alternatively, NCCCO proposes that trainers should be precluded from acting as evaluators with respect to any operator whom the evaluator has previously trained. NCCCO submits that individuals responsible for training operators are less likely to be in a position effectively to evaluate operators for whom they provide training services. The evaluation contemplated by the proposed Rule should provide an independent assessment of the "skills, knowledge, and judgment" necessary to operate the equipment safely. If the training and evaluation functions are combined and not separated, and if the evaluator is called upon to exercise substantial judgment in evaluating the subject or potential subject of training, then the validity of the evaluation tool is likely to be compromised because an evaluator may lack the requisite objectivity when conducting assessments of operators who are former or potential trainees. * * * By separating the training and evaluation functions, the proposed Rule is more likely to result in outcomes that ensure the quality of evaluations and improve worksite safety. (ID-1755).

OSHA understands the arguments against allowing trainers to act as evaluators for operators that they trained, but declines to prohibit this practice. It has not traditionally prohibited this type of practice, where employers conduct trainings for employees and also ensure that they comprehend that training. In this context, moreover, the certification and evaluation requirements are intended to work in tandem, and the certification requirement ensures that the operator has demonstrated basic skills, knowledge, and abilities through an objective, third-party examination process. OSHA also seeks to maintain a flexible standard that will allow employers to continue current practices where possible and minimize any additional cost or burden, such as hiring additional staff, on employers and small firms. If OSHA prohibited trainers from also serving as evaluators, employers would be bound to a process in which a formal evaluation would take place only after the completion of training. While that model is acceptable under the standard, OSHA also intends to allow employers to maintain more flexible models in which operators may be allowed to try new equipment, configurations, or tasks under the guidance of a trainer as the opportunities present themselves at the worksite. If the trainer also meets the

requirements of an evaluator, that person would be able to determine when the trainee has demonstrated sufficient skill, knowledge, and ability for particular equipment or tasks. The trainer/evaluator could evaluate and document the trainee's success and move on to other areas of training. This model may be particularly useful in scenarios where an operator is expected to operate many different pieces of equipment for many different tasks, using different configurations or attachments, when there are significant differences that would require additional skills, knowledge, or ability. A trainer also serving as an evaluator would be able to evaluate the operator as the operator gains experience with those different tasks, configurations, and equipment differences; it could save significant time and effort that would otherwise be required to replicate all of those scenarios later in front of a different evaluator. Finally, by allowing a trainer to also evaluate the operator in actual work settings engaged in tasks that the operator will be expected to perform, the evaluations might actually provide a more realistic gauge of the operator's skills, knowledge, and ability than in a more sterile evaluation setting. For all of those reasons, OSHA is not prohibiting an operator's trainer from also serving as that operator's evaluator.

One commenter asked how a small contractor could comply with the evaluation requirement when "hiring a crane" for a single lift, implying that the contractor does not have someone on staff who would qualify as an evaluator (ID-1476). There are at least two methods of compliance in that scenario. First, that contractor could select a firm that offers the crane along with a qualified operator who has been certified and evaluated by that firm. In that scenario the crane firm would be operator's employer and have the responsibility to ensure that the operator is certified and evaluated. Second, the contractor could hire a certified operator and contract with an outside party to evaluate the operator.²³

A "bare rental" company that rents cranes without an operator asked for clarification about its duties under OSHA's standard:

Who will be responsible for signing off on the operator's document of evaluation? As

²³ The same commenter (ID-1476) asked about the role of Construction Manager in this requirement under multi-employer projects. OSHA notes that the commenter did not include enough information to allow for a response because, for example, the construction manager might or might not be an employee of the operator's employer and may or may not have the required qualifications to serve as an evaluator.

the owner of the crane that we rent it to a company, we do not know who they will select to operate the crane, and from a legal stand point we do not want to sign off on somebody we do not know.

(ID-1495). In that scenario, the crane rental company is not the employer of the operator and will not be on site or otherwise be controlling the operator. OSHA's standard does not require that crane rental company to ensure that the operator of its crane is certified or evaluated. That would be the responsibility of the employer of the operator.

Paragraph (f)(5) permits the employer to allow an operator to operate equipment other than the specific equipment on which the operator was evaluated, as long as the employer can demonstrate that the new equipment does not require substantially different skills, knowledge, or abilities to operate. An additional evaluation would be required before an operator would be allowed to operate equipment that requires substantially different skills, knowledge, or abilities to operate.

OSHA believes this approach addresses the concerns of some stakeholders about unnecessary competency evaluations while ensuring appropriate evaluations of operators. Many stakeholders warned that unnecessary competency evaluations could be very time consuming and burdensome without providing any real safety benefit. Many employers who spoke with OSHA during meetings and site visits explained, for example, that they assign operators to run the same crane every day, or to operate a crane from a specific group of the company's cranes that are all very similar (Reports #1, 2, 3, 6, 13, 16, 19 of ID-0673). Others said that they permit their operators to run similar cranes interchangeably (see Report #15 of ID-0673). But other stakeholders indicated that they already follow practices that may exceed what OSHA is requiring. One large construction company, for example, requires its operators to go through a formal evaluation for any different equipment that the operators are assigned to run, even if the operators have already demonstrated competency, through an evaluation, to operate other similar equipment (Report #11 of ID-0673). Another large national construction firm provides supplemental testing for different crane configurations (Report #18 of ID-0673). And one stakeholder at the March 2015 ACCSH meeting explained that it requires a "seat check," an evaluation that may take a day or two, "every time that operator goes to a new machine . . . [w]e want to do the walk around

inspection. We want to test him on what he's absorbed when we walked around . . . includ[ing] safety checks, prestart and post-start" (see OSHA-2015-0002-0036, pg. 232-239).

As previously explained, OSHA does not intend to require the additional evaluation of operators when it is not necessary, such as when there are minor differences between equipment models of the same type that do not necessitate substantially different skills, knowledge, or abilities to operate the crane safely. As discussed earlier in reference to the general requirements in § 1926.1427(f)(1), OSHA's evaluation requirements will provide employers some flexibility when determining whether an additional evaluation is required.

This flexibility is necessarily cabined, however, by the employer's duty to ensure that its operator's skills, knowledge, and ability to recognize and avert risk are sufficient for safe operation at the jobsite. Some employers explained to OSHA that they often need operators to operate very different sizes and configurations of the type of equipment (or equipment of a different type) on which they evaluated the operator, to perform various tasks (see Reports #2, 4, 6, and 22 of ID-0673). Even an experienced operator, when assigned to operate a different crane, may need time operating the equipment under supervision to become familiar with how to safely operate it. One owner/operator stated that when he used different cranes in the past, even if they were all boom trucks built by the same manufacturer, he needed a substantial amount of time to familiarize himself with the significant differences between the cranes before he had the skills, knowledge, and ability to recognize and avoid risks necessary to safely operate them (Report #23 of ID-0673). OSHA concludes that it is reasonable that the employer may need to conduct an additional evaluation of the operator before determining that the operator is competent to safely run a different piece of equipment alone (Reports #3, 6, 16, 22 of ID-0673).

One commenter (ID-1615) requested clarification of the meaning of "that the employer can demonstrate" in § 1926.1427(f)(5), which relieves the employer of the need for additional evaluation for other equipment that the "employer can demonstrate does not require substantially different skills, knowledge, or ability to recognize and avert risk to operate." Specifically, the commenter asked whether an additional evaluation would be necessary for operation of two specific crane models: A 50-ton rough terrain hydraulic crane

and a 60-ton rough terrain hydraulic crane, which the commenter stated are "identical in operation, but different in capacity."

In requiring that employers demonstrate that the different equipment does not require substantially different skills, knowledge, or ability to identify and avert risk, OSHA intends that the employer will be able to justify the basis for its determination. An example of this justification could include an employer consulting an operator who has experience safely operating both pieces of equipment and could provide feedback about the differences in operation, or the employer could cite discussions with equipment manufacturers about the differences between models as justification for the basis of its determination. In response to the commenter, it is not likely that this change in capacity would require the employer to conduct an additional evaluation as long as the cranes are operated in similar configurations and other aspects of the crane (such as the computer operating systems, spatial arrangement of controls, control functions, safety devices, operational aides, mode of travel, and function of the equipment) are similar. However, changes in the configuration such as the use of different attachments (e.g., wrecking ball versus a clamshell), significant changes in boom length, or the addition of counterweights are a few examples of differences that may require an additional evaluation. Similarly, design differences like the location and function of the controls (e.g., the boom hoist control is located where the line hoist control was located on the other equipment) may also require the operator to become familiarized with these changes and some other limited evaluation of the operator's grasp of these changes. An evaluator meeting the requirements of § 1926.1427(f)(5) must be able to make these determinations, but can consult other appropriate individuals like the crane manufacturer or additional operators experienced with the equipment. Ultimately, if the difference in the controls and functions of the equipment is significant enough that the operator's unfamiliarity with the equipment may create a hazardous condition, then the employer must conduct an additional evaluation.

One of the certification entities, NCCCO, requested that OSHA "clarify the proposed § 1926.1427(f)(3) to indicate that the employer is only determining whether additional evaluation is necessary for different equipment, and that the employer's approval to operate "other equipment"

may be given only if the operator is also certified or deemed to have complied with the certification requirements for type of the other equipment at issue" (ID-1755). OSHA agrees that § 1926.1427(f)(5) has no impact on the requirements for operator certification. Regardless of the employer's determinations in the evaluations required under § 1926.1427(f), the employer must ensure that the operator is certified or working as an operator-in-training.

OSHA does not expect that the evaluation requirement will be overly burdensome for employers, particularly with the flexibility provided in paragraphs (f)(2) and (5). Although OSHA heard concerns from several commenters that OSHA would require that an operator be evaluated on every crane that their companies might use, or in every possible configuration, OSHA has explained that its revised rule does not require that. Furthermore, these commenters appear to have mistakenly assumed that OSHA would require each evaluation to be in the form of a time-consuming formal test rather than a much simpler observation of the operator performing construction operations using the crane. The required supplemental re-evaluation of a previously evaluated operator can focus on the operator's abilities to handle the differences between the new equipment and the one previously assigned; it would not require a complete evaluation of all of the operator's skills, knowledge, and abilities.

In general, the determination whether a new evaluation is needed turns on whether the safe operation of the new crane requires additional skills, knowledge, or ability to recognize and avert risk. For example, an employer may evaluate an operator and determine that he or she has demonstrated the ability to safely operate a large crane in a relatively complex configuration. If the employer determines that the operator has the skills, knowledge, and ability to identify and avert risk necessary to safely operate a smaller crane of the same type and operating system, in a simpler configuration with a shorter boom, then the operator would not need to be re-evaluated (assuming that the tasks are similar). Similarly, a new evaluation may not be necessary for an operator to operate a larger crane for the same task. Where the two cranes are configured similarly, and they have similar controls (including computer operating systems, spatial arrangement of controls, and control functions), safety devices, operational aides, mode of travel, and overall function, such that significant new skills, knowledge, and

ability to identify and avert risk are not necessary to operate the crane safely, then a new evaluation would not be required.

A commenter asked whether additional evaluations would be required if a crane and operator move to multiple locations (ID-1476). They would not, assuming that the operator remains employed by the same employer, the crane remains in the same configuration, and the operator would not be performing different tasks that require significantly different skills, knowledge, or ability to identify and avert risk. Evaluations are specific to the operators, equipment, and tasks, but are not dependent on location. However, if assigned work at multiple locations requires an operator to have substantially different skills, knowledge, or ability to recognize and avert risk, then an employer must perform an evaluation of the operator to ensure he or she can perform the assigned work.

Paragraph (f)(6) requires the employer to document the evaluation of each operator and to ensure that the documentation is available at the worksite. OSHA, by requiring this documentation to be available at the worksite in the NPRM, implied that the documentation must be maintained by the employer for the duration of the operator's employment. OSHA is adding language to this final rule that states explicitly the documentation must be maintained while the operator is employed by the employer. This language is similar to language in § 1926.1428(a)(3) requiring employers to maintain documentation of a signal person's evaluation while the signal person is employed by the employer.

This documentation requirement is also similar to documentation requirements in other OSHA standards that require competency evaluations, such as OSHA's powered industrial truck operator training requirements (§ 1910.178). The documentation under § 1926.1427(f)(6) must include: The operator's name, the evaluator's name, the date of the evaluation, and the make, model, and configuration of the equipment on which the operator was evaluated. But the documentation would not need to be in any particular format. Rather, employers would have the flexibility to capture this information using their own existing systems or create documentation that best meets the needs of their workplace. For example, employers could issue operator cards that include this information, keep records electronically in a database accessible at the worksite, develop logs for each piece of equipment, or use any other method

that memorializes the mandatory information.

The documentation requirement will ensure accountability and direct the employer's attention to the critical aspects of operating the assigned equipment that must be considered during the evaluation. The documentation of the evaluation will record key baseline information that an employer can use to help make subsequent determinations about whether the operator is competent to operate particular equipment on future projects. It will also provide a quick reference for site supervisors, lift directors, and any employee, such as a hoist crew member, whose safety is affected by crane operations. This information can help prevent any misunderstandings about, or mischaracterization of, an individual operator's established competency as determined by the employer, as in the *Deep South* fatal incident. There, an operator was assigned to operate a crane of a type for which he was certified, but the controls and operations were substantially different from those with which he was familiar. Had the employer conducted an evaluation and documented it rather than relying only on information specified on the operator's certification, this incident could have been prevented.

The agency's discussions with stakeholders indicated that information about operators is typically collected but not necessarily for regulatory compliance purposes. Many employers who spoke with OSHA during meetings and site visits explained that they maintain for their own purposes a log or record to track operator experiences, certifications, and performance evaluations. For example, at least two employers reported that they issue cards to evaluated and competent operators with information about those operators' qualifications. (Reports #11, 18 of ID-0673). Others use written records to track operators' performance, training, or other criteria. (Reports #1, 2, 3, 4 of ID-0673). And employers who own cranes and have long-term operators must provide lengthy and detailed operator information to their insurance providers.

Many subcontractors, too, are becoming accustomed to maintaining a written record of their operators' experience and evaluations. Some employers explained that, on multi-employer construction sites, subcontractors are often asked by general contractors, insurers, or other employers on the site to provide documented information about their operators, such as certifications and

verifications of training and "qualification" for the cranes operated. One crane rental company noted that it keeps records for each operator, and that this kind of information is often requested or required by customers. (Report #6 of ID-0673). Another company told OSHA that it frequently provides written information about its operators to contractors, even when not requested. (Report #26 of ID-0673). A contractor that sometimes works with subcontractors' operators noted that it maintains an in-house database of those operators, site supervisors, and directors that it has encountered on projects, with evaluations and notes about their performance. (Report #22 of ID-0673). Another company that employs operators as subcontractors keeps records of near misses involving its subcontractors, as well as documentation of operators that the company feels may not be qualified to operate equipment. (Report #14 of ID-0673). Finally, OSHA notes that it is a common practice within the construction industry for operators to carry certification cards provided by the testing entities as proof of certification. The documentation requirement of this paragraph will be even more useful in communicating operator competency for employers who must consider crane safety on multi-employer worksites.

As previously discussed, paragraph (f) permits the employer to evaluate the operator on one crane and then make a determination that the operator is also competent to safely run other equipment that requires the same level of operating skills, crane knowledge, and ability to recognize and avert risk. This provision allows employers to document these determinations collectively. For example, if an employer with five cranes, possibly configured in slightly different ways, determines that an operator's evaluation on Crane #2 also demonstrates the operator's competency with respect to the other four cranes, the employer could use a single document to record the operator's competence to operate all five cranes. In fact, the documentation for the original evaluation could simply be amended to state that it is also applicable to identified equipment that does not require substantially different skills, knowledge, or abilities. However, when the operation of a crane requires a level of operating skills, knowledge, or abilities that is significantly different from the crane on which the operator was evaluated, a new evaluation must be carried out and documented. Varying the facts in the earlier example, if two of that employer's cranes include

computer software to control safety devices and the three other cranes do not have such software but are otherwise similar, then an operator already evaluated on a crane without the software would need to be evaluated separately on the use of that software, with that evaluation also documented. However, the evaluation can be limited to only making determinations about the operator's ability to safely use the cranes that rely on computer systems.

Several commenters expressed concern that the documentation would take too much time and effort, particularly if employers are required to take time to separately evaluate and document each operator on each potential piece of equipment, safety device, operational aid, software, and the size and configuration of the equipment (see IDs 1611, 1615, 1623, 1801). One of these commenters asked OSHA not to require employers to document the make, model, and configuration of the equipment on which the operator was evaluated to "further reinforce" that operators are not required to be evaluated on every crane that their companies might use, or every possible configuration" (ID-1801).

These concerns are misplaced because, as OSHA explained earlier, the rule does not include any requirement that an operator must sit in the cab of each crane the company owns to be evaluated and documented as competent to run every make, model, or configuration of the employer's equipment. Moreover, when evaluations are required, the process of recording the specific information about the crane(s) in which the operator was evaluated (including the make, model, and configuration of the equipment) helps to *avoid* additional evaluations. The required documentation provides the baseline against which the employer can determine whether particular equipment used on future projects can be safely operated by that operator because it would not require substantially new skills, knowledge, or abilities. The make and model of the equipment provides a fixed reference point for the configuration and system of controls that are in particular machines as well as particular designs of safety devices and operational aids, etc. This information can be used in comparisons with other equipment that the operator may be assigned to operate on future projects. If employers do not preserve this information, it makes it more difficult for them to determine whether an operator requires a new evaluation to operate other equipment.

Another commenter acknowledged some uncertainty about the impact of

the documentation on its members and acknowledged documentation as "good corporate practice" followed by its members, but nevertheless asked OSHA to remove the documentation requirement:

Our view is that record keeping for evaluations is a good organizational practice, but should be not be a driver in a safety standard as it may divert resources away from activities that improve safety. Documentation and record keeping should be reserved as good corporate practice and should not be a requirement of the rule. * * * If documentation and record keeping are to remain a part of this rule, OSHA should ensure that small businesses, as qualified by SBREFA, are exempt in order to reduce undue burden on business operations or detract from safe work practices.

(ID-1779). A different commenter stated that it would "make sense for an employer to track evaluations on operators, so they would know what cranes an employee has been evaluated to operate and to provide protection from liability," but then claimed that OSHA's documentation requirement is "purely punitive in nature" and "only benefits OSHA." That commenter, however, offered no alternative means of tracking other than documentation (ID-1615).

These comments support OSHA's observation in the NPRM that many responsible employers already have systems in place to evaluate their operators and document that process; OSHA disagrees that the documentation is merely a "good corporate practice" that diverts resources from safety or a "punitive" measure that provides no benefit to the employer. First, as discussed above, the documentation is a critical means of tracking an operator's baseline qualifications in order to avoid future evaluations. This documentation must be available at the worksite in the event there is some uncertainty about the operator's qualifications. OSHA notes that "available at the worksite" includes accessing this information at the worksite via a computer or other electronic means. Second, because not all employers follow this "good corporate practice," the documentation requirement will help to ensure compliance with the standard. OSHA notes that "available at the worksite" includes accessing this information at the worksite via a computer or other electronic means.

Several commenters supported the documentation requirement. One commenter described OSHA's proposed documentation requirements as workable and providing sufficient flexibility to preserve existing employer practices:

ABC appreciates that this proposal does not create a new system of documentation, and instead leaves employers the flexibility to capture this information in a way that makes sense for their workplace. * * * ABC members already have advanced operator competency programs in place, which include their own system of documentation, and therefore, any requirement from OSHA to document this information in a standardized form would be duplicative and unnecessary.

(ID-1735). The National Roofing Contractors Association expressed support for the proposed rule, which included the documentation requirement, as "provid[ing] the necessary components to ensure the safety of NRCA members' workers and others while not altering significantly current compliance burdens members are obligated to meet" (ID-1619). The American Fuel & Petrochemical Manufacturers too supported the rule, stating that OSHA's approach was "aligned with" their previous requests for documentation of the evaluations and making that documentation available at the worksite (ID-1628).

OSHA is retaining the documentation requirement for the reasons discussed above. The agency views the documentation as critical to identifying the baseline for future evaluations of operators, similar to how documentation of monthly or annual inspections required under § 1926.1412 is used by a competent person or qualified person during subsequent inspections as the basis for tracking potential issues with the equipment and making determinations about whether that equipment is suitable for planned tasks. OSHA has also concluded that the documentation requirement includes enough flexibility to address the concerns raised by commenters.

In addition, OSHA is modifying the text of paragraph (f)(6) to provide a corollary to the new provision in paragraph (f)(2) that allows employers to provide initial documentation for operators that they are employing on the effective date of the rule, based on prior evaluations of those operators by the employers—another evaluation of those operators is not required for initial compliance with paragraph (f)(2). Because paragraph (f)(6) requires the documentation of the "completion of the evaluation," thereby implying that some evaluation has occurred, OSHA is adding language to that paragraph to clarify how employers following the new alternative approach in (f)(2) may satisfy the documentation requirement. In such cases, employers need only ensure that the documentation reflects the date of the employer's determination

of the operator's ability to safely operate the "make, model and configuration of equipment on which the operator has previously demonstrated competency." This documentation preserves the baseline measure for these operators against which their future crane operations can be measured. Again, the employer is only required to document the make, model, and configuration of the equipment on which the employer has previously assessed that operator. Employers are free to, but not required to, list all of the makes, models, and configurations of all of the equipment that the operator is permitted to operate. For example, the employer may document that the operator has previously demonstrated that he or she is qualified to operate Crane A, and then also record that, based on that qualification to operate Crane A, the operator is also qualified to perform the same tasks using the Cranes B, C, and D. In that example, the employer does not have to record the make and model of Cranes B, C, and D in order for the operator to operate them as long as it is clear which cranes are referenced.

Paragraph (f)(7) requires the employer to re-evaluate an operator whenever the employer is required to retrain the operator under § 1926.1427(b)(5). Section 1926.1427(b)(5) requires retraining if the operator's performance or an evaluation of the operator's knowledge indicate that retraining is necessary. OSHA intends this requirement to ensure that when an employer becomes aware that an operator is not competent in a necessary aspect of safe crane operation, the employer provides additional training to the operator and re-evaluates the operator. Re-evaluation is needed to ensure that the operator is competent in the area of the observed deficiency.

As discussed in the explanation for paragraph (b)(5), triggers for retraining under paragraph (b)(5) and re-evaluation under paragraph (f)(7) might include a wide variety of feedback, such as (but not limited to) information from an on-site supervisor or safety manager, contractor, or other person that the operator was operating equipment unsafely, OSHA citations, a crane near miss, or other incidents that indicate unsafe operation of the crane.²⁴ The re-evaluation must target the deficiency in skills, knowledge, or ability to recognize and avert risk that triggered the retraining, but need not include a re-evaluation of other previously evaluated

skills, knowledge, or ability. Re-evaluations would need to be conducted by a person who meets the requirements of paragraph (f)(4).

OSHA does not view this re-evaluation as a significant departure from typical practices in the industry. As discussed previously, many stakeholders who spoke with OSHA at meetings and site visits emphasized that observation and re-evaluation take place on an ongoing, daily basis (see the *Background and Need for a rule* sections). For example, several stakeholders told OSHA that they would re-evaluate an operator if there was a crane near-miss or other incident indicating unsafe operation of the crane, or if they received negative feedback about that operator's performance from the controlling contractor or another party on a jobsite. (Reports #1, 2, 3, 18, 19, 22, 26 of ID-0673). Some employers conduct random worksite audits. (Reports #2, 3, 15, 18, 19 of ID-0673). One large construction company stated that it conducts over 100 safety audits of job sites each year to ensure operators are properly qualified. (Report #15 of ID-0673). Four companies that hire crane rental companies (crane rental with operators) noted that they raise any observed issues with the employer of the crane operator or the union from which the operator was selected. (Reports #12, 14, 15, 16 of ID-0673).

OSHA requested comment on the re-evaluation requirement, noting in the NPRM that the requirements for re-evaluation are also in line with the powered industrial truck operator training standard, in which OSHA requires re-evaluation if there is reason to believe that the operator is operating unsafely, if there is a near-miss or other incident, if the nature of the work to be performed changes, or if other factors indicate a deficiency (§ 1910.178(l)(4)) (see 83 FR 23554). One commenter generally agreed with this approach, but requested that OSHA not include a fixed time period for renewals such as the 3-year period required in the powered industrial truck standard. "As a practical matter," the commenter stated, "reevaluation of [powered industrial truck] operators employed in the construction industry occur far more frequently than triennially" and "contractors evaluate crane operators daily, mandatory reevaluations of crane operators at arbitrarily-selected intervals are unnecessary and will not advance crane safety" (ID-1719). Another commenter suggested that re-evaluation of an operator should be required "if there is a demonstrated need, or the technology or operations controls or expectations change" (ID-1615). A

different commenter, however, asserted that, in addition to requiring re-evaluations following observations of unsafe operation, OSHA should specify a fixed time period for re-evaluations "at least on the same cycle as recertification (that is, at least every 5 years)" because "certification procedure does not ensure competency for the particular equipment the operator is assigned" (ID-1768).

OSHA agrees with the commenters opposing fixed evaluations times that the record does not indicate a compelling need for re-evaluations at fixed intervals. While the one commenter requesting fixed re-evaluations is correct that the re-certifications required every five years do not serve the same function as re-evaluation on particular equipment, re-certification would at least ensure that the operator is familiar with significant changes in the industry. In general, operators should not require the same type of refresher for specific equipment that is not changing, particularly equipment that they are operating regularly. If there are significant changes to the equipment on which an operator was previously evaluated, such as the retrofitting of a new computer system or significant safety device onto that equipment, the employer would need to retrain the operator on that equipment and re-evaluate the operator's ability to operate the retrofitted equipment if an evaluation of the operator's knowledge indicates that retraining is necessary for the operator (this evaluation is required under paragraph (f)(1) because the employer must ensure that the operator demonstrates the skills and knowledge to operate the equipment safely, "including those specific to the safety devices, operational aids, software").

Thus, the regulatory text addresses the commenter's concern about changes in technology (ID-1615). Near misses and other unsafe operation are examples of when the "performance of the operator . . . [provides] an indication that retraining is necessary" under paragraph (b)(5). OSHA is not clear about the intent of the same commenter's suggestion of re-evaluation when "expectations change" (ID-1615), but regulatory text would require evaluations when there is a change in the tasks to which the operator is assigned that would require new knowledge, skill, or ability to identify and avert risk.

Paragraph (g)—[Reserved]

This paragraph is reserved because the text at previous § 1926.1427(g) was moved to revised paragraph § 1926.1427(c)(4). The provision was

²⁴ In proposed § 1926.1427(f)(5), OSHA inadvertently referred to compliance with retraining requirements under a non-existent paragraph (b)(6) instead of the correct reference to paragraph (b)(5). OSHA has corrected this error in the final rule.

moved to improve clarity of certification program requirements.

Paragraph (h)—Language and Literacy Requirements

Previous paragraph § 1926.1427(h) allowed operators to be certified in a language other than English, provided that the operator understands that language. Revised paragraph (h) is nearly identical to previous paragraph (h) with one exception. The last sentence of paragraph (h)(2) has been reworded to clarify that an operator is permitted to operate equipment only when he or she is furnished materials that are necessary for safe operation of the equipment and required by subpart CC, such as operations manuals and load charts, in the language of the operator's certification. The reference to previous paragraph (b)(2) was not maintained in proposed (h)(2) because it is no longer needed.

Paragraph (h) continues to allow "tests" in languages understood by the operator. In revised paragraph (h), "tests" encompasses both the certification test and the employer's evaluation of the operator. Either or both may be in any language understood by the operator. The language of the operator's manual or other furnished materials required by the standard would only need to match the language of the certification.

Paragraph (i)—[Reserved]

Paragraph (j)—Certification Criteria

Paragraph (j) specifies criteria that must be met by an accredited testing organization under revised paragraph (d) and an audited employer program under revised paragraph (e). The criteria specified by revised paragraph (j) of this section are the same as those specified under previous § 1926.1427(j). However, the introductory regulatory text in the previous version of § 1926.1427(j) states that "qualification and certifications" must be based, at a minimum, on several criteria for the written and practical tests found in § 1926.1427(j)(1) and (2). Revised paragraph (j) deletes the words "qualification and" because they are no longer necessary. Under the revised rule, a certification issued by an audited employer program is intended to be equivalent to that of an accredited testing program for purposes of complying with OSHA's rule. In the NPRM, OSHA neglected to replace the word "qualification" with "certification" in paragraph (e)(6)(i), so it is making that revision in this final rule. The other references to "qualification" have been removed from paragraph (e) in the final rule.

Paragraph (k)—Effective Date

Almost all of Subpart CC has already been in effect since 2010, the certification requirements were scheduled to go into effect on November 10, 2018 per OSHA's extension rule published last year (see 82 FR 51986 (November 9, 2017)). The effective date of this final rule applies to the certification requirements and all but one of the amendments. As explained below and as an exception, OSHA has decided to allow 90 days after the publication of the final rule for employers to conform their practices for evaluating their operators, including documenting the evaluations, to the requirements of OSHA's standard.

OSHA anticipates that most employers will require only minimal adjustment to their current practices, if any, such as documenting evaluations if they have not previously followed that practice. Employer assessment of operators has been a key part of the entire scheme of § 1926.1427 in effect through § 1926.1427(k) for eight years, so employers should already have a system in place that could be adapted as necessary to the new requirements.

Nevertheless, several commenters requested additional time to adjust to the new evaluation requirements. Three commenters requested that OSHA extend the November 10, 2018, deadline for one year (ID-1605, 1779, and 1801). One of these commenters stated that the extension was needed to provide "an adequate amount of lead-time for instituting any new requirements for crane operator qualification" and "allow OSHA enough time and the opportunity to finalize the proposed rule" (ID-1605). The second of these stated that the additional time would "permit entities subject to certification requirements additional time to plan for and implement compliance" and "help alleviate any burden felt by small business affected by the rule" (ID-1779). The third of this group of commenters suggested that the additional time was necessary to "provide employers who have not currently certified their operators with sufficient time to do so," and encouraged OSHA to "align the effective date for successful evaluations of new or existing operators with that of the requested operator certification extension," but did not provide any additional rationale for their recommendation (ID-1801).

Three commenters requested a six-month extension for OSHA to finalize the rulemaking and allow time for employers to adjust (IDs 1611, 1735, and 1826). Another requested an indefinite extension of the operator certification

requirement while OSHA reconsidered exemptions from the standard (ID-1707).

OSHA agrees that some phase-in period is appropriate for the evaluation and documentation requirements, but disagrees that it is appropriate for the certification requirements. Employers have had ample notice since 2010 that certification requirements were going to go into effect.

A trade association for the lumber industry (ID-1821) requested a year to develop training and evaluation programs that would comply with § 1926.1427(b) and (f) because "the training requirements in proposed § 1926.1427(b) significantly differ from the current training requirements, and . . . would impose new measurable standards that will take time to incorporate in current training and evaluation programs" (footnotes omitted). OSHA does not recognize any substantive difference between the revised training requirements in § 1926.1427(b) and the previous requirements in § 1926.1427(f) except that the revised training requirements are clearer regarding the duty for continued training even after obtaining certification. The commenter's footnote 34, however, indicates that the commenter is comparing the revised training requirements to the phase-in operator competency requirements in § 1926.1427(k), which are separate and different from the main training requirements in prior §§ 1926.1427(f) and 1926.1430. Those operator training requirements have been in effect since 2010.

A labor organization (ID-1816) urged OSHA not to delay the effective date of the certification requirement or the amendments to the standard:

Given the health of the construction economy there are, unfortunately, crane operators running types of equipment for which they are not fully qualified. In this way, the tight labor market places particular urgency on OSHA to implement the crane certification requirement thereby reducing the safety risks to workers as soon as possible. * * * we do not believe that a 6-month "phase-in" period is necessary given the certainty that now exists for workers, employers, and other stakeholders in crane-operator certification.

With respect to the evaluation requirements, there are more specific substantive differences between the revised standard and the previous standard, so it is understandable that employers may need some period of adjustment. The time periods suggested by the commenters appear excessive because the adjustment from the type of assessment required to comply with

prior § 1926.1427(k) compared to the revised provisions should not be that significant. OSHA believes that the 90-day extension strikes a more appropriate balance to address the urgency expressed by the labor organization and the need for some transition period as outlined by other commenters.

Section 1926.1430(c)—Conforming Changes to Operator Training

As noted earlier in this preamble, OSHA has amended only paragraph (c) of the training requirements in § 1926.1430 by replacing the substantive operator training requirements with a reference to § 1926.1427(a) and (b). The primary purpose of this revision is to centralize the training requirements that are specific to operators in revised paragraph § 1926.1427(b). However, OSHA has retained in § 1926.1430 the training requirements that are more broadly applicable. OSHA requested comments on the proposed change, but received none. The paragraph is therefore revised as proposed.

Paragraph § 1926.1430(c)(1) requires that the employer train operators of equipment covered by subpart CC in accordance with § 1926.1427(a) and (b), which contain all of the requirements for training under the final rule. Operators of equipment that remains exempted from the training requirements of § 1926.1427—derricks, sideboom cranes, and cranes with a rated hoisting/lifting capacity of 2000 pounds or less—are addressed by paragraph § 1926.1430(c)(2). Revised paragraph (c)(2), which is substantively the same as paragraph (c)(3) of the 2010 crane rule, provides a general requirement to train operators on the safe operation of the equipment. Paragraphs (c)(1) and (2) of this section work together to specify training requirements and clarify that all operators must be trained, regardless of whether an operator must be licensed/certified by any entity (including the U.S. military) to operate equipment.

Section 1926.1430(c)(2) of the 2010 crane rule, *Transitional Period*, is no longer needed because employees need to train all operators under this final rule. The requirements of previous § 1926.1427(c)(4) have been moved to paragraph (c)(3) of this section.

Sections 1926.1436(q)—Derricks, 1926.1440(a)—Sideboom Cranes, and 1926.1441(a) Equipment With a Rated Hoisting/Lifting Capacity of 2,000 Pounds or Less

As noted in the explanation for revised § 1926.1427(a)(2), OSHA had proposed to apply the employer evaluation requirements to the

following group of equipment otherwise exempt from the requirements of § 1926.1427: Derricks, sideboom cranes, and equipment with a rated hoisting/lifting capacity of 2,000 pounds or less. To accomplish the application of the evaluation requirements, OSHA had proposed revising § 1926.1436(q) (Derricks), § 1926.1440(a) (Sideboom Cranes), and § 1926.1441(a) (Equipment with a Rated Hoisting/Lifting Capacity of 2,000 Pounds or Less) to require employers to evaluate operators according to the requirements in revised § 1926.1427(f).

One commenter (ID-1611) opposed any new evaluation requirements for derricks absent substantial evidence that this additional measure, which includes a requirement to document the evaluations, is warranted. In the 2010 final rule, OSHA relied on C-DAC's recommendation to exclude digger derricks, sideboom cranes, and low-capacity cranes (hoisting capacity at or below one ton) from the certification requirements of the standard and also went further in excluding this group of equipment from all of the requirements of § 1926.1427, including the phase-in requirement for employer assessment of operators in § 1926.1427(k). Instead, OSHA required employers to "train each operator . . . on the safe operation of equipment the individual will operate" (derricks and low-capacity cranes; see §§ 1926.1436(q) and 1926.1441(e)) or comply with the operator qualification provisions of ASME B30.14-2004 (sideboom cranes, see § 1926.1440(c)(10)). In the NPRM of this rule, OSHA also clarified that sideboom cranes would need to comply with the training requirements in § 1926.1430 (see proposed § 1926.1427(a)(2)).

In light of the concern about an unwarranted burden on employers raised by the commenter and the fact that OSHA had not previously explained its exclusion of this group of equipment from the phase-in assessment requirements in § 1926.1427(k), OSHA has decided not to change the status quo that has existed for the last eight years with respect to this group of equipment. OSHA still requires employers to train operators of this equipment in accordance with the requirements of this standard. The agency therefore is not requiring employers to comply with the evaluation or documentation requirements in § 1926.1427(f) when their operators use derricks, sideboom cranes, or low-capacity cranes. As a result, operators of this group of equipment do not have to comply with any of the provisions of § 1926.1427, so

it is not necessary to revise § 1926.1436(q), § 1926.1440(a), or § 1926.1441(a) as proposed because those paragraphs already state that compliance with § 1926.1427 is not required.²⁵

IV. Agency Determinations

A. Legal Authority

The purpose of the OSH Act, 29 U.S.C. 651 *et seq.*, is "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources." 29 U.S.C. 651(b). To achieve this goal, Congress authorized the Secretary of Labor to promulgate and enforce occupational safety and health standards. 29 U.S.C. 654, 655(b), and 658. A safety or health standard "requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment." 29 U.S.C. 652(8). A safety standard is reasonably necessary or appropriate within the meaning of 29 U.S.C. 652(8) if:

- It substantially reduces a significant risk of material harm in the workplace;
- It is technologically and economically feasible;
- It uses the most cost-effective protective measures;
- It is consistent with, or is a justified departure from, prior agency action;
- It is supported by substantial evidence; and
- It is better able to effectuate the purposes of the OSH Act than any relevant national consensus standard.

(See *United Auto Workers v. OSHA*, 37 F.3d 665, 668 (D.C. Cir. 1994) (*Lockout/Tagout II*)). In addition, safety standards must be highly protective. See *id.* at 669.

A standard is technologically feasible if the protective measures it requires already exist, available technology can bring these measures into existence, or there is a reasonable expectation for developing the technology that can produce these measures. (See, e.g.,

²⁵ Another commenter was concerned that OSHA was changing the scope of the existing exemption for "digger derricks," which is a group of equipment used primarily for electric utility and telecommunications construction (ID-1779). This limited exemption, which is in § 1926.1400(c)(4), removes digger derricks from the entire cranes standard, but only to the extent that employers are using this equipment for work covered by OSHA's electric utility standard for construction (Subpart V of 29 CFR part 1926) or telecommunications construction (29 CFR 1910.268). OSHA did not propose to change this exemption for digger derricks and is not altering the exemption in this final rule, so the new evaluation requirements in this final rule do not apply to operators of digger derricks exempted from the scope of the standard by § 1926.1400(c)(4).

American Iron and Steel Inst. v. OSHA (Lead II), 939 F.2d 975, 980 (D.C. Cir. 1991) (per curiam).) A standard is economically feasible when industry can absorb or pass on the costs of compliance without threatening an industry's long-term profitability or competitive structure. (See *American Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 530 n. 55 (1981); *Lead II*, 939 F.2d at 980.) A standard is cost effective if the protective measures it requires are the least costly of the available alternatives that achieve the same level of protection. (See, e.g., *Lockout/Tagout II*, 37 F.3d at 668.)

Section 6(b)(7) of the OSH Act authorizes OSHA to include among a standard's requirements labeling, monitoring, medical testing, and other information-gathering and information transmittal provisions. 29 U.S.C. 655(b)(7). Finally, the OSH Act requires that when promulgating a rule that differs substantially from a national consensus standard, OSHA must explain why the promulgated rule is a better method for effectuating the purposes of the Act. 29 U.S.C. 655(b)(8). OSHA explains deviations from relevant consensus standards elsewhere in this preamble.

B. Final Economic Analysis and Regulatory Flexibility Certification

Introduction

When it issued the final crane rule in 2010, OSHA prepared a final economic analysis (2010 FEA) as required by the OSH Act (29 U.S.C. 651 *et seq.*) and Executive Order 12866 (58 FR 51735 (Sept. 30, 1993)). OSHA also published a Final Regulatory Flexibility Analysis as required by the Regulatory Flexibility Act (5 U.S.C. 601–612). Both the 2010 FEA and Regulatory Flexibility Analysis are in Docket ID 422. On September 26, 2014, the agency included a separate FEA when it published a final rule extending until November 10, 2017, both the deadline for all crane operators to become certified, and the employer duty to ensure operator competency (79 FR 57785). In November 2017, OSHA published another extension for an additional year, until November 10, 2018 (82 FR 51986), which closely tracks the 2014 FEA analysis. For each rulemaking, OSHA published a preliminary economic analysis (PEA) and received public comment on the analysis before publishing the final analysis.

In the NPRM for the current rulemaking, OSHA included a PEA that relied on some of those earlier estimates, extensive agency interviews with industry stakeholders, crane

incident data, and other documents in the rulemaking record. For example, the 2017 FEA for the deadline extension rule included a cost analysis of the employer evaluation to ensure operator competency. As a result, the cost estimates in the PEA in the current rulemaking were based on that analysis, which in turn is drawn from the 2014 FEA. Following the approach taken in the PEA, this Final Economic Analysis estimates new costs only for elements that have not previously been accounted for in either the 2010 final rule or in the deadline extensions. These are:

- Additional evaluations to ensure operator competency when there are changes not just in the type of crane (accounted for in the 2017 FEA) but also changes that would require new skills, knowledge, or ability to recognize and avert risk necessary to operate the equipment safely, including those specific to the use of equipment or its safety devices, operational aids, software, or the size or configuration of the equipment.

- The permanent status of the employer duty to assess competency. While the cost of employer's duty to assess operator competency was estimated in the 2017 rule, the duty to assess was assumed to phase out after the deadline had passed. This final rule makes this duty permanent, so these costs are included in this FEA.

- Documentation by employers. This rule now requires employers to document the successful completion of operator evaluations.

- Additional training required beyond the training necessary for certification. Certain unit costs, such as the initial cost of operator certification and recertification every five years, are not re-analyzed in the FEA because they are unchanged by this rulemaking. The rule makes no changes that would impact the costs of certification by type of crane; OSHA simply allowed the existing operator certification deadline to be instituted as planned. The employer evaluation, which under the 2010 final crane rule (and the 2014 and 2017 extensions) was set to be phased out when certification took effect, remains in effect and is therefore a cost of the final rule. The unit costs of the employer evaluations were analyzed in the final rule of the deadline extension FEAs, and the agency relied on that analysis in calculating the ongoing evaluation costs in this FEA. In this FEA the agency has also updated wage rates to reflect the latest 2017 estimates that are from the same source as used in the PEA: Occupational Employment Statistics (OES), prepared by the U.S. Bureau of Labor Statistics. The PEA

relied on 2016 wages because the 2017 data was not yet available in time for the preparation of the PEA.

The rule's cost savings are associated with withdrawing the requirement that crane operator certification be both for type and capacity of crane in favor of new regulatory text that certification be *required* only for type of crane.

For the PEA, OSHA included an overhead rate when estimating the marginal cost of labor in its primary cost calculations. Overhead costs are indirect expenses that cannot be tied to producing a specific product or service. Common examples include rent, utilities, and office equipment. Unfortunately, there is no general consensus on the cost elements that fit this definition, and the lack of a common definition has led to a wide range of overhead estimates. Consequently, the treatment of overhead costs needs to be case-specific. OSHA adopted an overhead rate of 17 percent of base wages.²⁶ This is consistent with the overhead rate used for sensitivity analyses in the FEA in the 2017 final rule on Improved Tracking (81 FR 29624) and the FEA in support of the 2016 final rule on Occupational Exposure to Respirable Crystalline Silica (81 FR 16286). For example, to calculate the total labor cost for a crane and tower operator (SOC: 53–7021), three components are added together: Base wage (\$26.78) + fringe benefits (\$11.92, slightly more than 44% of \$26.78) + applicable overhead costs (\$4.55, 17% of \$26.78).²⁷ This increases the labor cost of the fully-loaded wage for a crane operator to \$43.25. OSHA received no comments on this approach to estimating overhead costs and, as a result, has used the same approach in this FEA.

One change in costs for this FEA beyond updating economic data was

²⁶ The methodology was modeled after an approach used by the Environmental Protection Agency. More information on this approach can be found at: Cody Rice, U.S. Environmental Protection Agency, "Wage Rates for Economic Analyses of the Toxics Release Inventory Program," June 10, 2002 (ID-2025). This analysis itself was based on a survey of several large chemical manufacturing plants: Heiden Associates, Final Report: A Study of Industry Compliance Costs Under the Final Comprehensive Assessment Information Rule, Prepared for the Chemical Manufacturers Association, December 14, 1989.

²⁷ Throughout this chapter, OSHA presents cost formulas in the text, usually in parentheses, to help explain the derivation of cost estimates for individual provisions. Because the values used in the formulas shown in the text are shown only to the second decimal place, while the actual spreadsheet formulas used to create final costs are not limited to two decimal places, the calculation using the presented formula will sometimes differ slightly from the presented total in the text, which is the actual and mathematically correct total.

that the 2017 OES does not include the same occupation category for crane inspector (SOC 5353-1031 First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators) that was in the 2016 OES and that was used in the PEA. The agency instead proxies the 2017 mean hourly wage for this SOC category by adjusting the 2017 OES crane operator hourly wage by the percentage markup of the 2016 crane inspector hourly wage over the 2016 crane operator hourly wage (8%, 28.75/26.58). The resulting estimated crane inspector hourly wage is \$28.97 (26.78 × 1.08). Including a benefit markup of 1.45 (but not including overhead), the full hourly wages of a crane operator and crane inspector are \$38.70 and \$41.86, respectively.

As noted earlier in the preamble, OSHA received a comment from the National Propane Gas Association (NPGA, ID—1631), echoed by many others, questioning whether OSHA had accurately estimated the number of operators in the propane gas industry affected by the standard as follows:

OSHA states that there are approximately 117,130 crane operators subject to the proposal and an annual cost to the proposal of \$1,425,133. There is no indication that these estimates include the propane industry, which has about 40,000 propane field technicians who perform delivery and retrieval functions and, thus, would be subject to the third-party certification required by the proposal. * * * [T]he industry uses two types of cranes interchangeably to deliver or retrieve propane containers . . . [so] propane field technicians would require two certifications; one for each type of crane.

(ID-1631).

OSHA has previously accounted for the propane gas industry. In its 2010 FEA, OSHA estimated that “each of the retail establishments has, on average, a truck-mounted crane that would be engaged occasionally in construction activity covered under the rule” (see 75 FR 48087). OSHA also estimated in 2010 that there were a total of 5,567 establishments in the propane industry (NAICS 454312, Liquefied Petroleum Gas Dealers). Therefore, with an average of one crane per establishment affected by the standard, there were 5,567 cranes affected by the standard (Id.). OSHA continued to rely on these numbers in the economic analyses accompanying the two extension rulemakings in 2014 and 2017, treating the number of establishments as a proxy for the number of propane crane operators

requiring certification under the standard.²⁸

To support its claim that OSHA has underestimated the rule’s cost to the propane industry, NPGA pointed OSHA to a recent study of the consumer propane industry in 2015 prepared by the Propane Education & Research Council (PERC) (see ID 1631, Part 2). NPGA relies on that study in asserting that OSHA underestimated the number of establishments, and therefore operators, in the PEA for this rulemaking. Specifically, NPGA claims that a new 4-Digit NAICS code for “Fuel Dealers” (45431) encompasses relevant propane establishments that are covered by the cranes standard but were not accounted for in OSHA’s previous analysis of NAICS 454312, Liquefied Petroleum Gas Dealers (Id.).

Based on NPGA’s comment, OSHA believes that it may have previously underestimated the number of covered establishments and has decided to increase its estimate in this analysis. Because the PERC study does not identify which establishments in the “Fuel Dealers” NAICS code are actually propane delivery firms that might occasionally engage in construction activity, OSHA has conservatively revised the industry profile to include all 8,341 of the establishments in that more general NAICS code. However, OSHA believes that many of these 8,341 establishments may not be propane delivery firms that engage in construction activity. This revision adds 2,774 additional establishments to OSHA’s previous estimate of 5,567 establishments in the PEA. Continuing OSHA’s methodology of estimating one certified crane operator per establishment, OSHA is estimating that there are 8,341 crane operators in this industry that occasionally use a crane for construction activity.

The NPGA’s analysis takes a different approach, disregarding OSHA’s approach of estimating the number of operators engaged in construction work per establishment. Instead, as quoted earlier, NPGA asserts that every operator possible—“about 40,000 propane field technicians who perform delivery and retrieval functions”—will use two different types of cranes, with each technician evidently requiring two different certifications under the theory that *each* technician uses *both* types of cranes for work covered by OSHA’s

²⁸ The NPGA did not dispute OSHA’s estimates of the number of crane operators when it commented on the 2014 extension (ID-0487). In response to the 2017 extension, the NPGA only encouraged OSHA to “consider more recent cost estimates” but did not specify any new numbers (ID-0648).

construction standard (ID-1631). Thus, NPGA asks OSHA to assume that every propane field technician in the industry operates two different cranes and does so in situations involving construction activity, and that propane gas employers are ignoring standard measures of economic efficiency by having all employees engage in all tasks.

OSHA disagrees with this approach. Propane field technician operators would fall under the crane rule in only one very specific and limited scenario: Installation of new tanks (not replacement of existing tanks in kind) at a construction site. As the NPGA acknowledges, delivery occurs at a construction site “a far lower percentage of the time” than at non-construction sites and that OSHA’s cranes standard applies to only “a small percentage” of propane delivery work (ID-1631). Indeed, another stakeholder from the propane industry estimated that only “around 10 percent of new construction jobs (such as new homes in rural areas) annually will require propane delivery” (Report #19 of ID-0673, p. 76). NPGA has not indicated that conversion of existing homes to propane from other sources (thus requiring the delivery of a brand new tank) constitutes any significant percentage of their deliveries. OSHA therefore concludes that propane deliveries covered by OSHA’s construction standard constitute ten percent or less of propane employer activities.

OSHA notes that its conclusion is confirmed by a review of additional data. Using New Construction starts data from the US Census (at https://www.census.gov/construction/nrc/pdf/quarterly_starts_completions.pdf) the average number of construction starts (both single family and multi-unit) per year for the years 2015–2017 was 1,163,000. If 10% of the new construction starts involve the installation of propane, then 116,300 deliveries subject to OSHA’s standard would be required. The same research group that created the 2015 propane report that NPGA relied on in its comments also provided an estimate that “about 30,000 fuel oil households per year have converted to propane.”²⁹ Adding this to the new construction estimate above gives a total of 146,300 deliveries of new tanks per year, which, based on NPGA’s estimate of 40,000 operators in the propane industry, results in an average of 3.66 jobs per

²⁹ Sloan, Michael, 2016 Propane Market Outlook, ICF International for the Propane Education and Research Council, p. 20, available at https://www.afdc.energy.gov/uploads/publication/2016_propane_market_outlook.pdf (visited 10/1/18).

propane operator per year (146,300/40,000).

Given that only operators engaged in construction activity must be certified under OSHA's standard, and that only a very small percentage of overall delivery activity constitutes construction activity covered by OSHA's standard, OSHA disagrees that all operators in this industry will require certification. While it is technically possible that every operator would go on two different jobs with two different cranes such that all would need two certifications, such an approach would ignore economic convention. As with specialized work in general, an economically rational employer will, in most cases, be able to assign a consistent operator to handle this small percentage of specialized activity rather than assuming the cost to have all of its employees prepared to engage in a small percentage of the employer's overall activity. OSHA therefore continues to estimate that each establishment on average will require one certified operator to handle the occasional delivery of tanks that would be covered by OSHA's construction rule.

OSHA's estimate is consistent with the information OSHA obtained during its interview with a propane distribution company that told OSHA it operates approximately 50 delivery centers in 11 states and maintains a fleet of 49 truck cranes (Id.), which is an average of almost one crane per delivery center. It is possible that a few establishments may require more than one certified operator due to special circumstances, but OSHA expects that number to be offset by the number of smaller establishments that would not be covered by OSHA's construction standard because they use equipment that is outside the scope of the standard (rated lifting capacity of less than 2,000 pounds). Such establishments would only engage in re-fueling existing tanks or replacing existing tanks in kind, or they only deliver new tanks to the ground at a construction site (see OSHA's June 27, 2016, response to Mr. Robert F. Helminiak, former Director of Regulatory Affairs for the National Propane Gas Association, that simply transferring propane tanks from the equipment directly to the ground is considered "delivery" and covered by applicable requirements of general industry standards, not construction standards. Included in NPGA's comments, ID-1631, Appendix b-3). Furthermore, OSHA believes that its adoption of the highest end of the potential number of establishments provides an adequate margin to account

for differences between the one-operator-per-establishment estimate and the actual number of operators at each establishment who would be engaged in construction activity.

Due to these factors, the agency is not persuaded by the NPGA's economic analysis for either the number of operators or the cost of certification. OSHA has increased the number of affected establishments (and thus affected operators) in this FEA for this industry, but not to the extent proposed by NPGA.

The remainder of the FEA first discusses the estimates for each type of cost and cost savings and then summarizes the net cost savings. Subsequent sections discuss economic and technological feasibility, regulatory flexibility certification, and finally potential benefits of this final rule. For this FEA, OSHA reviews any comments about its estimates at the end of the relevant sections.

Given the updating of economic data, and the changes from the proposal to the final rule, the revisions to the standard will result in a cost savings of \$1,752,000, at a 3 percent discount rate (versus the PEA estimated cost savings of \$1,828,000), and \$2,388,000 at the discount rate of 7 percent (versus the PEA estimated cost savings of \$2,469,000k).

Evaluation Costs

This section evaluates two kinds of evaluation costs: (1) The addition of evaluations when operators change equipment, configurations, or tasks that require new evaluations; and (2) the addition of evaluation requirements for all new employees. OSHA also increased its estimates of how many operators would require evaluations as a result of the addition of more propane delivery operators, as discussed above.

As noted in the preamble explanation of this final rule, OSHA received feedback during stakeholder meetings, site visits, and interviews that, for a small percentage of employers, the proposed rule's requirements for additional evaluations for specific situations may have increased the number of operator evaluations they would conduct. The increase from previous estimates would result if employers need to conduct additional equipment-specific or task-specific evaluations.

To estimate the costs for the new evaluations required by this rule (evaluations of operator knowledge and skills required to operate different equipment or perform new tasks), the agency had taken the following steps in the PEA, and the agency followed the

same methodology for the FEA. First, it estimated the number of new evaluations required by the proposed rule. Then it estimated the unit costs for each evaluation. Finally, the agency multiplied the number of evaluations times the unit cost to identify the total costs of the proposed rule due to new evaluations.

OSHA began its preliminary estimate of the number of evaluations by looking to its former rulemakings. In the 2017 deadline extension economic analysis, OSHA estimated employers' evaluations due to turnover of crane operators between employers, changes in the type of equipment operated for the same employer, and evaluations of operators new to the occupation. OSHA used the same estimate of total number of evaluations in the original 2010 crane rule.

In the 2017 deadline extension economic analysis, OSHA estimated the total number of new evaluations needed each year to be 30,981 evaluations (26,940 successful initial evaluations as well as 4,041 (15 percent of 26,940) for operators who have to be re-assessed (82 FR 51993)). The added propane field technician operators, with the standard 23% turnover and 15% re-assessment, contribute another 733 evaluations (23% * (1 + 15%) * 2,774) for a total of 31,715 evaluations each year.

However, after conducting extensive interviews with crane industry stakeholders for this rule, OSHA preliminarily determined in the PEA for this rulemaking that the agency had previously overestimated the number of new evaluations that the rule would require to be performed because OSHA had assumed that, in the absence of the rule, no employer would conduct evaluations. In fact, stakeholders reported that almost all employers conduct evaluations of new employees. As a result, the agency modified its estimates to estimate that 50 percent of employers (rather than 100 percent) would need to conduct such evaluations and, as a result, 15,490 annual evaluations would be attributable to this rule (83 FR 23559). The addition of the propane field technician operators, discussed earlier, adds another 367 evaluations (50% of the 733 total propane evaluations, as identified earlier) for a total of 15,857 evaluations each year that will occur as a result of this rule. The agency believes that even this estimate likely overestimates costs given that most employers conduct such evaluations and that assessments have been required for at least the last eight years under § 1926.1427(k). None of the commenters questioned OSHA's estimate that at least 50 percent of

establishments already provided the appropriate evaluations, and thus OSHA has not changed this estimate for this FEA.

In the PEA, OSHA also estimated a small increase in evaluation costs from those in the 2017 deadline extension analysis because of the additional specificity in this rule about when evaluations are required and what an employer must evaluate. Specifically, proposed § 1926.1427(f) required evaluation as necessary to ensure that the operator maintains the “skills, knowledge, and judgment necessary to operate the equipment safely” and to perform assigned tasks, including specialty lifts such as blind lifts or multi-crane lifts. A similar version of this requirement is included in this final rule (with the replacement of “judgment” with “ability to recognize and avert risk”) and therefore OSHA retains this estimated increase in evaluation costs for this FEA.

In the PEA, OSHA preliminarily estimated that the proposed rule’s specificity would lead to an additional 15 percent of evaluations, on top of the 15,490 evaluations conducted to comply with the less specific prior rule (83 FR 23559), or 2,324 “new evaluations.” OSHA explained that the stakeholder meetings and extensive OSHA interviews indicated that this new language would not require many employers to change their existing operator evaluation practices. Even before its 2010 rulemaking, OSHA required employers engaged in construction to ensure that their operators were capable of operating their equipment safely (§§ 1926.550 and 1926.20(b)(4) prior to promulgation of the crane standard on November 10, 2010). So for most employers, this final rule will simply be a requirement to continue their existing evaluation practices. OSHA further noted in the proposal that none of the stakeholders OSHA met with expressed any concerns about their ability to comply with these requirements (83 FR 23559). None of the commenters contested OSHA’s estimate of a 15 percent increase in evaluations or disputed the agency’s assessment of existing practices.

In this FEA the agency again estimates that this rule will add 15 percent more evaluations, but that 15% is calculated from a higher total number of operator evaluations that includes the additional 367 propane operators. Thus, in this FEA OSHA estimates that there will be an additional 2,379 (15% × 15,857) “new evaluations” as a small percentage of operators increase their evaluations of operators who are switching equipment or performing more difficult

tasks. This represents a very small percentage of the total costs of evaluations.

The second element needed in order to estimate the total cost of evaluations is the unit costs for these evaluations. OSHA’s unit cost estimates for evaluations, which are unchanged from the PEA except for increases in wage rates, took into account the time needed for the evaluation, along with the wages of both the operator and the specialized operator evaluator who will perform the evaluation. In its 2017 FEA, OSHA estimated that an initial evaluation of an experienced operator with a compliant certification would take, on average, one hour (82 FR 51992). The new evaluations generated by the specificity of the rule would all be for previously evaluated, experienced operators who are adding a new skill or new knowledge to an existing skill set, not an initial evaluation for a brand new operator or an experienced employee new to the firm. Thus, in many cases any evaluation time will be minimal.

Due to the specificity of the evaluation requirement in this rule, OSHA included the ongoing cost for the initial evaluations, which it had estimated previously in the 2017 FEA. These evaluations will continue to be necessary because of turnover of crane operators between employers, changes in the type of equipment operated for the same employer, and evaluations of operators new to the occupation. The total cost for these evaluations in this FEA is lower than the total evaluation cost estimated in the 2017 FEA. This is partly because the evaluations cost in the 2017 FEA was for an operator population that was a mix of operators with a compliant certification (certified by both the type and capacity of crane), non-compliant certification (by type but not capacity), and no certification. The time for evaluation, and hence its cost, was linked to operator certification status and varied for these three types with the least time (one hour) for an evaluation of an operator with a compliant certification. The new final rule removes the existing requirement for certification by capacity, meaning there would be no operators in the previously estimated “non-compliant certification” group. This means that all operators would receive evaluations for operators with a compliant certification and hence will have the same unit cost for a one-hour evaluation. The hourly wage of the evaluator was estimated to be the same as the hourly wage of occupation First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators (SOC: 53–1031 from the BLS 2016 OES dataset

updated to 2017) of \$46.78 in 2017 dollars including a markup for fringe benefits and overhead.³⁰ The operator’s time is valued at the wage plus fringe benefits of occupation Crane and Tower Operators (SOC: 53–7021) plus overhead, at \$43.25. Hence, the combined hourly cost for an evaluation or a training episode is \$90.04 (\$43.25 + \$46.78).

Multiplying that unit cost by the 15,857 initial evaluations estimated in this FEA, the total annual cost for these ongoing initial evaluations is \$1,428,000 ($\$90.04 \times 15,857$).³¹

The total cost for the 2,379 new evaluations, which are for experienced operators who are adding a new skill or new knowledge to an existing skill set, is therefore the product of multiplying that unit cost by the total number of evaluations: $\$22.51 \times 2,379$ new evaluations = \$54,000.

The total annual cost for evaluations is therefore \$1,481,000, which is the sum of the \$1,428,000 in initial evaluations and the \$54,000 for new evaluations.³²

No commenter raised specific objections to the estimates used in the PEA for the costs of evaluation. Some comments suggested generally that OSHA’s preliminary estimate of the number of evaluations was low, based on an apparent misunderstanding of the standard (see, e.g., ID 1623, 1801). For example, one commenter (ID–1801) was concerned that OSHA’s requirement to document the make and model of crane on which an operator was evaluated meant that OSHA would require a separate evaluation for every single make and model of crane that a crane operator might use. This is not the case. While the employer must list the make and model of the crane that the operator was evaluated on, the employer can then rely on that evaluation as a baseline and allow the operator to use other cranes that do not require significant new skills, knowledge, or ability to identify and avert risk in order for the operator to operate the equipment safely. Another commenter (ID–1623) states that “One crane company alone testified [at an ACCSH meeting] that the cost to document all of his employees on every crane he owns, with each capacity, configuration and new additional requirements would cost him more than ONE MILLION dollars.” The commenter did not provide any explanation or basis for that

³⁰ The fringe markup is 1.45, derived from the BLS Employer Costs for Employee Compensation, Private Industry Total Benefits for Construction Industries March 2018.

³¹ Totals may not add up due to rounding.

³² Totals may not add up due to rounding.

amount, and the agency does not find this plausible and suggests it is a misreading of the rule. OSHA's single evaluation cost is \$90.04, so to reach one million dollars in cost for a single employer, that employer would have to do 11,106 evaluations each year (1,000,000/90.04).

Other commenters expressed some confusion about who had to conduct the evaluation. Some asked if an employer renting a crane with an operator(s) had to conduct its own evaluation (see ID-1495, ID-1615). This is not required. The crane rental company is the employer of the operator in that scenario and carries the duty to evaluate its operator. Thus, there is no expense for an additional evaluation for operators who are provided with rented cranes. Some small businesses were concerned that they might not have an employee with the expertise to evaluate a crane operator (see ID-1495.) The employer is responsible for assuring that an operator has been evaluated, but need not conduct that evaluation itself. The employer can, for example, arrange for an evaluator from another organization, such as a labor organization or crane operator training company, to serve as its agent and evaluate a crane operator from a union hiring hall.

Employer Evaluation Documentation Costs

The rule adds a new documentation requirement for a successful evaluation. In both the PEA and the FEA, OSHA estimated the annual evaluation documentation costs using the following three steps: It estimated unit costs of meeting this requirement; estimated the total number of cases of documentation that employers will need to perform in any given year; and multiplied unit costs of documentation by the number of cases to determine the annual costs.

This final rule requires that employers document information about the equipment that the operators is evaluated on (make, model, and configuration) and include the evaluator's signature. Because of this, the agency determined that the evaluator will complete all recordkeeping related to this documentation. OSHA's unit cost estimates for evaluation documentation take into account the time needed and the wage of the employee who completed the documentation. The time needed for creating and filing the needed information is estimated to be 5 minutes of the evaluator's time. As above, the hourly wage of the evaluator is estimated to be \$46.78. Hence, the

cost of documenting a successful evaluation is $\$3.90 ((5/60) \times \$46.78)$.

The revised standard does not require employers to re-evaluate operators who have already previously demonstrated that they have the skills, knowledge, and abilities to operate the employer's equipment safely. The employer may rely on previous assessments of these operators, but must still document their qualifications (see preamble discussion of § 1926.1427(f)(1)(iii) and (f)(4)). In the PEA, the agency preliminarily determined that employers would have documented most evaluations in the past, but estimated the number of past evaluations still needing documentation at 15 percent of the number of operators, or 17,570 (15% \times 117,130) (see 83 FR 23560). This approach assumed that each employer would need to document employees evaluated within the year prior to effective date of the rule, but not all existing employees. To account for the one time need to document the evaluations for all existing employees, and not just those hired in the last year, OSHA is assuming all employees not hired in the last year (85 percent derived as 100 percent minus the 15 percent new in that year) would need to be documented. The FEA is thus raising the number of evaluations needing documentation to 85 percent of the number of operators, or 99,561 (85% \times 117,130), thus taking account of the need to document past or ongoing evaluations of all employees.

With the addition of 2,774 propane field technician operators, the total number of evaluations needing documentation is estimated to be 102,335 (99,561 + 2,774) in this FEA. This estimate is based on the final rule's clarification that all evaluations of existing employees must be documented, but existing operators at the time the rule becomes effective do not need to be re-evaluated from scratch. This estimate assumes that all existing employees not subject to turnover or changes in equipment will need new documentation. This almost certainly overestimates the need for documentation because it ignores existing documentation practices, which OSHA's interviews with stakeholders indicate exist. This total extra first year cost is \$399,000 ($\$3.90 \times 102,335$). Annualized over 10 years at a 3 percent discount rate gives an annualized cost of \$47,000. At a discount rate of 7 percent, this annualized cost is \$57,000.

Employers are only required to document successful evaluations, and OSHA estimates that 15% of the operators will fail their evaluations. As noted above, OSHA estimates 15,857 initial evaluations and 2,379 new

evaluations, for a total of 18,236 evaluations. With this 15% failure rate, only 15,857 evaluations would require documentation (18,236/1.15). OSHA calculated that the total annual documentation cost, absent the first year extra documentation costs for existing, previously evaluated operators, is \$62,000 ($\3.90 per evaluation \times 15,857 evaluations).

In the PEA, OSHA requested comment on its estimates of the documentation costs. While none of the commenters dispute any of the individual components of OSHA's documentation cost estimates, most of the same comments that expressed concern about costs because of an apparent confusion about the number of evaluations that would be required also raised the same concern about the number of documentations and resulting costs (ID-1623, 1801).

Employer Costs for Operator Training

The final rule clarified the operator training requirements as proposed, and OSHA retained the same methodology in its analysis of the training costs. As explained in the 2010, 2014, and 2017 rulemakings, employers were already required to train their operators prior to the 2010 rule, and OSHA did not estimate additional training costs other than costs of optional certification preparation training classes in its recent rulemakings (see, e.g., 75 FR 48097). The revised rule clarifies that the training already required under the previous rule continues to be required even after an operator is certified, including training necessary when an operator requires new knowledge or skills because of a change in equipment or tasks. Although OSHA's site visits and interviews indicated that most firms are already providing the required training, including the additional training necessary to ensure that certified operators have the skills and knowledge to operate new equipment or perform new tasks, OSHA calculated costs for additional trainings that may occur as a result of this clarification.

OSHA's calculation of the cost of these additional trainings required several steps. First, OSHA estimated the average annual number of equipment-specific or task-specific trainings as a percentage of the new evaluations required by the rule, as estimated earlier. OSHA expected the number of trainings to be a subset of the number of evaluations because in many cases the operator will already possess the required skills necessary for a new piece of equipment or a new task and be able to demonstrate competency after only a cursory explanation of the differences.

For example, an experienced operator conducting a blind lift for the first time may have sufficient mastery of the equipment such that she could pass an evaluation after only a very brief discussion of the signals to be used. In the PEA, the agency judged that 50 percent of the new evaluations, or 1,162 evaluations ($50\% \times 2,324$), would also require trainings (83 FR 23560–23561). OSHA did not receive any comment on this estimate. Using the same estimates for the newly included propane field technician operators adds 28 additional evaluations (15% of 366 evaluations is 55, and 50% of 55 is 28) that will require additional training for a total of 1,189 ($1,162 + 28$) instances where additional training will be needed.

The second step is to identify an average amount of time that each training will take. Some trainings are likely to require detailed instructions about operating particular equipment and discussions of protocol prior to a lift. Other trainings might involve a very short period of instruction, such as to familiarize an experienced operator with the setup of standard controls in a different crane of the same type with which the operator already has experience. While OSHA lacked data about the frequency of these different types of trainings, it estimated in the PEA that the average time for each training is one hour (83 FR 23561). For context, this is the same amount of time that OSHA previously estimated that it would take for an inexperienced operator to take the practical portion of the standard crane operator test. OSHA solicited comment on this one-hour estimate, but received none. OSHA has therefore relied on the same estimate in this FEA.

OSHA expects two employees to be occupied during this hour of training: The equipment operator and the trainer. Using the same wage estimates as above, the hourly wage for the operator would be \$43.25 and a supervisor's hourly wage of \$46.78 for the trainer. However, not all of the training time will result in a loss of productivity to the employer. OSHA's site visits and interviews indicate that it is common for operators to spend at least some of the training time operating the crane under the instruction of the trainer, performing tasks that actually are useful for the employer. While all of the trainer's time is an opportunity cost for the employer, at least part of the operator's time results in productivity for the employer. OSHA estimated in the PEA that, on average, 75 percent of the operator's training time (45 minutes of the hour) would consist of pure instruction or other activities that would not be

productive for the employer (Id.). OSHA requested comment on this estimate but received none and is therefore relying on that estimate in the FEA. Based on the estimated one hour for each training, the unit cost for each training is therefore the supervisor's wage for one hour (\$46.78) plus \$31.95 in operator's wages for the 45 minutes of non-productive time (Three quarters of the operator's hourly wage of \$43.25), or \$79.22 per training. Thus, the total cost of the training industry-wide is \$94,000 ($\$79.22 \times 1,189$).

Cost Savings of Avoiding Additional Certifications

Absent this final rule, all crane operators who are currently certified only by crane type would have needed to obtain certification both by type and capacity. This final rule removes the requirement for certification by capacity and allows employers to rely on either "type and capacity" or "type only" crane certifications, leaving only certification by crane type as the obligation of the crane standard. To calculate the cost-savings of additional certifications that would be avoided by the final rule, OSHA estimated the number of crane operators not yet in compliance with the type-and-capacity certification requirement and multiplied that estimate by the estimated cost of obtaining such certification.

Based on OSHA's previous rulemakings, OSHA estimated that 71,700 crane operators do not yet possess a type-and-capacity certification. (82 FR 51993). Although the 2014 FEA estimated a gradual decline over time of the number of such operators (an estimate of 61,474 in 2016, see Table 1, 79 FR 57796), the 2017 extension estimated that 71,700 operators were not yet in compliance and would not be for much of 2017 and 2018 leading up to the new 2018 deadline. (see Table 1, 82 FR 51995). In the PEA, the agency accordingly estimated the number of operators certified by crane type only would remain at 71,700 each year and no commenters provided better data. OSHA adopted this approach because 71,700 was the last hard data point the agency had, and relies on it again in the final rule.³³ Certification has likely gradually

³³ Note that this 71,700 operators is not impacted by OSHA's increase in the total number of operators to account for additional propane industry operators because this number only reflects operators certified by type of crane, but not capacity, who would have needed to obtain a new certificate by capacity. The NPGA has indicated that the majority of its operators have not yet obtained any certification under the hope that they would be excluded from the standard, so those operators are not included in the group of 71,700.

spread as an expected job qualification in the crane operator job market, so it is quite possible that the number of operators possessing a type, but not type-and-capacity certification, is actually higher today. The largest certification school issues a certificate by type only, which means there may be additional cost savings that OSHA is not attributing to this final rule since there are more operators certified by type only who would not have to become certified by type and capacity.

OSHA looked to the 2017 deadline extension rule to estimate the unit cost of a type and capacity certificate. There, the agency estimated that such a test would take 2.5 hours and require a \$250 fixed testing fee (82 FR 51994). At the hourly crane operator wage noted above (\$43.25), the total cost for a compliant certification is \$358.13 ($\$250 + (2.5 \times \$43.25)$). If 71,700 crane operators needed to take the test, the cost would be \$25,678,000 ($71,700 \times \358.13). These costs include only the time and costs necessary for certification, and do not include the costs necessary for training for the certification examination, which would occur prior to taking the type-only examination. Because this rule would remove the requirement for additional certifications by capacity, that amount becomes a cost saving.

Commenters presented two different challenges to OSHA's estimates of the unit cost for certification. The NPGA's comment, mirrored in many of the comments that were part of a mass mailing from the propane industry, claimed that the unit cost for two certifications is \$3,790, which would be \$1,185 per certificate ((ID-1631, Part 2). However, the NPGA's estimates are for a brand new operator (including preparatory class time as well as the tests), which is different than the cost that OSHA estimated here for the purpose of determining costs savings from avoiding an *additional* certificate for an operator who already has a type-only certificate.³⁴

The IUOE identified a per-certification cost from NCCCO of \$225, which is slightly lower than OSHA's estimate of \$250 (ID-1816). But the IUOE estimate does not account for the hourly cost of the operator's time to take the certification exam. The agency notes

³⁴ The economic analysis used by the agency to estimate costs for new operators (those without any certificates) results in a comparable number that is actually slightly higher than NPGA's estimate. See, for example, the 2014 deadline extension analysis: "OSHA estimated that training and certification costs for an operator with only limited experience would consist of \$1,500 for a 2-day course (including tests) and 18 hours of the operator's time, for a total cost of \$2,141.16." (79 FR 57794).

that its estimate costs the average price in the market, not a single firm, and believes its current costs are reasonable. Note to the extent the agency is underestimating costs this means its estimate of cost savings is too low.

This, of course, is a one-time cost savings, while costs of continued evaluations and most of the other cost elements of the rule are ongoing. Using the agency's standard 10 year horizon, the result is an annualized cost savings of \$3,010,000 at a discount rate of 3 percent, and an annualized cost savings of \$3,656,000 at a discount rate of 7 percent.

The agency estimates there will also be ongoing cost savings due to a number of certifications that would have only been needed for a change in capacity (but not type) and hence no longer will be needed. More than half of certified crane operators have been certified by a certifying body (including state and local governments) that does not issue certificates by capacity, which indicates that many of these operators may not need multiple capacity certifications. OSHA conservatively estimated the value of this cost savings by taking 50 percent of the 2,379 additional evaluations, or 1,189 (0.50 x 2,379) as an

additional number of annual certifications that would have been required solely due to changes in crane capacity but not crane type. The unit cost for this certification follows previous analysis in assigning a \$250 flat fee for the certificate, as well as 1.5 hours of the operator's time for the written exam and 1 hour for the practical exam. This gives a unit cost of \$358.13 (\$250 + (2.5 x \$43.25)). Finally, the total annual cost savings for these avoided certifications is \$426,000 (1,189 x \$358.13). Hence, along with the one-time cost savings due to omitted certifications, the total cost savings for these two elements are \$3,436,000 (\$3,010,000 + \$426,000) at a 3 percent discount, and total cost savings for these two elements of \$4,082,000 (\$3,656,000 + \$426,000) at a 7 percent discount rate.³⁵

As noted above, OSHA may be somewhat underestimating the cost savings of this final rule, which would offset any potential underestimation of costs. Regardless, this has no effect on the economic feasibility of this rule.

Total Cost of the Final Rule

The total annual cost of the final rule comprises the cost items identified

above: Evaluations (those previously calculated with offsets from the removal of the requirements to certify by capacity and with the additional evaluation costs to account for new skills and tasks), documentation of the evaluations (including the one-time first year evaluation documentation for existing, currently employed operators without such documentation), and training costs. The cost savings is due to averting the need for all operators who currently have a type only certification to obtain a type-and-capacity certification. Since the last item is relatively large and primarily occurs in the first year while the other costs are ongoing, the discount rate and discount horizon have a significant impact on the final total cost. At a discount rate of 3 percent the sum of those parts is a cost savings of \$1,752,000 (\$1,428,000 + \$54,000 + \$62,000 + \$94,000 + \$47,000 - \$3,010,000 - \$426,000). Using a discount rate of 7 percent there are cost savings of \$2,388,000 (\$1,428,000 + \$54,000 + \$62,000 + \$94,000 + \$57,000 - \$3,656,000 - \$426,000).³⁶

Here is a summary table of all the costs:

SUMMARY TABLE-ANNUALIZED COSTS

	3% Discount rate	7% Discount rate
Initial evaluations	\$1,428,000	\$1,428,000
new evaluations	54,000	54,000
ongoing documentation evaluation	62,000	62,000
Training	94,000	94,000
Initial evaluation documentation (annualized)	47,000	57,000
non-capacity certifications, current population (cost savings, 10 years annualized)	(3,010,000)	(3,656,000)
non-capacity certifications, ongoing (cost savings)	(426,000)	(426,000)
Total	(1,752,000)	(2,388,000)

Economic and Technological Feasibility

The agency has determined that the proposal is technologically feasible because many employers already comply with all the provisions of the revised rule and the rule would not require any new technology. Ignoring cost savings, the cost elements of significance for this rule making are the evaluation requirement with associated training of \$79.22 per training and \$90.04 for each operator evaluation, for a total of \$169.25 per operator, which should be a small expense for the

businesses covered under this rule. The vast majority of employers already invest the resources necessary to comply with the provisions of the standard. Hence the agency preliminarily concludes that the standard is economically feasible.³⁷

Certification of No Significant Economic Impact on a Substantial Number of Small Entities

The largest cost element of the revisions to the rule is an evaluation requirement with associated training of \$79.22 per training and \$90.04 for each

operator evaluation, for a total of \$169.25. Small businesses will, by definition, have few operators, and the \$169.25 cost for each operator evaluation with training will not be a significant impact for even the smallest businesses. At an hourly wage of \$43.25, the annual salary for an operator is \$86,500 (\$43.25 x 8 x 5 x 50), so this operator evaluation cost is 0.2% (169.25/86,500) of an operator's annual salary. Hence, OSHA certifies that this final rule will not have a significant economic impact on a substantial number of small entities.

³⁵ Totals may not add up due to rounding.

³⁶ Totals may not add up due to rounding.

³⁷ A number of commenters questioned the impact of the standard's requirement for operator certification on their industries (see for example

1612, 1631, 1746 and many other comments from the propane gas industry). The requirement for operator certification is already part of the standard and the removal of that requirement is beyond the scope of this rulemaking, as explained earlier in the preamble to this rulemaking. OSHA demonstrated

the economic feasibility of operator certification requirement in the 2010 rulemaking; the agency need not re-analyze it in this rulemaking, which addresses certification only to the extent that it reduces the number of certifications required by the standard.

As with economic feasibility, there were a number of commenters focused on the impact of the standard's requirement for operator certification on OSHA's preliminary determination that the rule would not have a significant impact on a substantial number of small businesses. As noted in the economic feasibility analysis, this rulemaking addresses certification only to the extent that it *reduces* the number of certifications required by the standard.

Benefits

OSHA's 2010 Cranes and Derricks in Construction standard included an extensive analysis of the benefits attributed to preventing crane-related fatalities and serious injuries. In that analysis, OSHA relied on IMIS injury data made available in 2008 (see 75 FR 48093), finding that the standard would prevent 175 injuries and 22 fatalities per year for a total annual benefit of \$209.3 million (75 FR 48079-48080).

OSHA, in the proposal for this rule, preliminarily concluded that allowing certification by type only would result in no loss of benefits. OSHA received only one comment challenging that conclusion. That commenter, a representative of a certification body that issues certifications by capacity, claimed that "[r]etaining capacity will require more stringent testing resulting in an increase in crane safety, thus fewer accidents." (ID-1235), but this commenter did not provide further explanation of why the testing would be more stringent or any evidence that it would increase safety.

While testing organizations differed over whether a certification by capacity provided any useful information to an employer, the remainder of the commenters agreed that capacity is just one factor to be considered in the employer's overall evaluation of the operator's ability. Only one commenter opposed removing certification by capacity, but even that commenter did not point to any specific loss of safety benefits. The majority of commenters that responded to this issue support removing the certification by capacity requirement (ID-0690, 0703, 0719, 1611, 1616, 1619, 1628, 1632, 1719, 1735, 1744, 1755, 1764, 1768, 1801, 1816, 1826, 1828). None of the commenters supporting the removal of the requirement for certification by capacity indicated that the removal of that requirement would result in any loss in safety benefit. An industry group whose membership uses cranes for roofing work stated that capacity "did very little to advance the safe operation of cranes at construction jobsites" (ID-1619). A local chapter of a labor union noted that

the two certification bodies that offer certification by capacity did not offer any safety evidence to the agency in OSHA's previous public hearings or stakeholder meetings (ID-1719). Referring to consensus standards and industry best practices, a national labor organization implied that there is no industry recognition of a safety benefit from certification by capacity, noting that ASME B30.5 "does not describe testing or examination by capacity," and the organization "is not aware of any state or local regulatory body . . . that requires certification or licensing by both type and capacity" (ID-1816). In its request for comments on this issue, the agency specifically asked for information that demonstrated the safety benefits of certification by capacity, but it did not receive any such information.

As noted in the sections on "Background" and "Need for a Rule," OSHA received significant feedback from stakeholders following the 2010 final rule indicating that the standard, to be fully effective, would need to preserve the employer duty to evaluate operators separately from the general operator certification requirement. Certifications are intended to address basic operator knowledge and skills, but do not assess operators' familiarity with the actual equipment they will operate or the specific tasks they will perform. The amendments to the standard in this rulemaking make that employer duty permanent and add specificity, thereby ensuring that the full benefits of the standard will be realized.

The safety benefit of the rule is the prevention of injuries or fatalities resulting when operators certified to operate the type of crane assigned still lack the knowledge or skill to operate that crane for the assigned task. As noted earlier, there are many variables in equipment and controls between different models of the same type of crane, and there are many crane operations that require additional knowledge and skill beyond that demonstrated during certification (e.g., swinging a "headache ball" instead of lifting a load, performing a blind lift, participating in a multi-crane lift, etc.). Certification does not address these variables or provide assurance that the operators are qualified to safely operate the equipment for the task assigned, so without these amendments operators could be permitted to perform equipment operations after November 2018 that they are not qualified to operate safely. OSHA has already determined that there is a significant risk of injury when operators are

allowed to operate heavy machinery that they are not qualified to operate.

The 2010 crane rule estimated annual net benefits at \$55.2 million in 2010 dollars (75 FR 47914). Since there are cost savings for this final rule, net benefits of the joint 2010 final rule and this final rule are vastly greater than zero.

While this rule attempts to realize the full benefits already identified in 2010 for the standard, and OSHA need not parse the benefits of each provision of the standard separately, OSHA recognizes that the revision to the standard is also likely to generate additional benefits from the more specific requirement for employers to evaluate operators on specific equipment for specific tasks. To explore this, OSHA conducted further analysis of recent IMIS incident reports in an effort to illustrate the new benefits of the evaluation requirements beyond the benefits that would be achieved through the previous standard with operator certification alone.

OSHA looked at IMIS accident reports for 2009-2013, years subsequent to the data used for the FEA for the 2010 rulemaking. All accidents with any of the search terms "boom," "crane," or "pile driver" in either the event description or in the abstract were examined, the same keywords as used in the analysis for the 2010 final rule. OSHA identified incidents where there was an express mention in the IMIS description that the crane operator was unfamiliar with the specific crane equipment used during the incident, or with the specific task. Using this methodology, the agency has been able to identify three fatalities that may have been prevented if the updated evaluation requirement had been in place at the time. It is true that there was a general duty to ensure operator competency at the time of these incidents (see §§ 1926.20(b)(4) and 1926.1427(k)(2)). But, as explained above, that previous employer duty was stated very generally and employers might have believed that a preliminary general examination of the operator could satisfy the requirement without accounting for evaluation of the operator's ability to operate different models of the same type or perform new tasks.

OSHA believes that the revised rule, which makes the evaluation duty permanent and includes more detailed evaluation documentation requirements, would make it more likely an employer conducts the appropriate type of evaluation and therefore more likely that such incidents would be avoided in the future. By specifying the elements to

be evaluated, OSHA expects the evaluations to be more effective at preventing injuries by identifying operator limitations in a timely manner. For example, the employer might have believed it was complying with the previous general employer duty if it evaluated an operator and found that the operator was qualified to operate a particular crane to lift pallets of material, even though the employer did not perform any additional evaluation before assigning the operator to a lift that required additional skills, such as a blind lift or lifting poles instead of pallets. As indicated by the second IMIS example below, there is greater risk of injury if the operator is not qualified to perform the new task. OSHA expects the documentation requirement to assist employers in complying with the different evaluation elements of the standard. And OSHA expects that the documentation requirement will facilitate communication between supervisors and operators and help avoid assignment of an operator to equipment or tasks for which he or she is not qualified, thereby reducing the risk of injury from unqualified operation.

The IMIS summaries are not particularly detailed or uniform, so many more of these incidents may also have involved similar operator failures that were not explicitly detailed in the IMIS summary. But the complete IMIS abstract of each fatal incident follows.

Case One: Operator not competent to use specific equipment:

At approximately 2:50 p.m. on June 16, 2009, an employee was walking toward a seawall the company was reconstructing when a section of the boom failed and fell on him. The employee was killed. The crane had been built in 1964, and was bought by Ray Qualmann Marine Construction, Inc. on April 29, 2008. The company never performed an annual inspection of the crane or a monthly one, and documentation was not available to indicate any maintenance had been done to the crane. The only documentation available for the crane was an inspection report dated June 10 2009, made by a crane operator who worked for the company, which failed to identify that the crane did not have a boom angle indicator, that several lacings were bent on it, and that the angles and spacing of the repaired lacings were uneven. In addition, neither the crane operator who operated the crane on the day of the accident, nor the foreman, had ever seen the operator's and maintenance manual for the crane involved in the accident. The crane operator was not familiar with the controls of the crane. The operator did not know the weight of the load, and did not know the length of the boom. The crane was overloaded when the accident occurred.

The general manager of Ray Qualmann Marine Construction claimed

that the operator had extensive crane experience and had worked for the company for more than 20 years. OSHA concluded in its investigation, however, that the company allowed the operator use of the Link-Belt LS-58 crane with no training for this equipment. The abstract indicates that the lack of familiarity with the specific equipment used contributed to the fatality. An evaluation of the operator's competency on the specific equipment, rather than the general skills and knowledge tested as part of the third-party certification process, would have been more likely to identify the problem in this case and avoid the resulting fatality.

Case Two: Operator not competent to perform specific task:

On November 17, 2009, employees with Moreau's Material Yard were driving pilings for an oil rig foundation in which a 4,000 lb hammer, attached to the top of the lead, was used to drive 70 to 75 ft poles into the ground. Employee #1 was working on a crawler crane platform approximately 20 to 25 ft above the ground. He was wearing a harness with a lanyard connected to a ladder rung. When the crane tipped over, Employee #1 attempted to jump from the platform to the ground below. He was struck by the crane and killed. The crane operator sustained minor injuries. Other employees indicated that the employer had never lifted poles of that size and the crane boom may have been used at an improper angle for the load being carried.

It is clear from the IMIS report that the operator was familiar with crane equipment but had never lifted poles of that size. While all of the details of the task are not included in the abstract, the note about the different pole size and the operator's use of an improper boom angle suggest that the activity was significantly different from previous activities such that it would have required different knowledge or skills. This incident and resulting injuries might have been prevented if the employer took the time to evaluate the operator for the specific task assigned.

Case Three: Operator inadequately trained:

On June 23, 2011, Employee #1, an ironworker, was installing a structural steel bracing and painting structural steel beams in the ceiling of a manufacturing plant addition. Employee #1 was working alone from a boom-supported aerial work platform that was borrowed from another employer. At approximately 11:15 a.m., an electrician walked into the area and found the aerial work platform elevated with Employee #1 slumped over the controls. Employee #1 was crushed between the work platform and one of the ceiling beams. Other tradesmen at the worksite used the ground controls to lower Employee #1 to the floor. Employee #1 died from the injuries. Employee #1 had been trained in operating a boom-supported aerial work platform by his employer, but was not

trained in the differences between those aerial work platforms that were owned by the employer and the borrowed lift being used the morning of the incident. The drive controls on the borrowed aerial work platform may have been reversed from the actual direction that they would operate.

The abstract does not include enough information to be certain as to whether the "boom-supported aerial work platform" was equipment that would be covered by the crane standard (it could be a simple aerial lift not covered by the standard, or a boom crane or multi-purpose machine configured to support the work platform in a manner that would be within the scope of the standard). Nevertheless, the incident illustrates the potentially fatal consequence of requiring an employee to operate new equipment without ensuring that the employee can account for differences in control locations and functions. Like the previous cases, the employee received training for certain crane equipment but lacked the skills necessary to operate the borrowed machinery used on the day of the accident. Had the employee been evaluated by his employer before using the equipment, the employee's unfamiliarity with the equipment could have been identified earlier and the fatality might have been prevented.

OSHA presented the same analysis of benefits, including these IMIS summaries, in the NPRM and received no comment challenging OSHA's analysis of the benefits of the rule or of the IMIS summaries provided. As discussed in the Summary and Explanation, most commenters agreed with OSHA's conclusion that evaluation improves safety, even if the effect could not readily be quantified. While there were many suggestions as to the best approach to the requirements for employer evaluation, there was virtually no opposition to the basic concept of requiring employers to evaluate their operators.

C. Paperwork Reduction Act

Overview

The final "Cranes and Derricks in Construction: Operator Qualification" rule contains information collection (paperwork) requirements that are subject to review by OMB. The Paperwork Reduction Act of 1995 (PRA), 44 U.S.C. 3501 *et seq.*, and its implementing regulations, 5 CFR part 1320, require that the Department consider the impact of paperwork and other information collection burdens imposed on the public. A Federal agency generally cannot conduct or sponsor a collection of information, and the public is generally not required to

respond to an information collection, unless it is approved by OMB under the PRA and displays a currently valid OMB Control Number. In addition, notwithstanding any other provisions of law, no person may generally be subject to penalty for failing to comply with a collection of information that does not display a valid OMB Control Number. See 5 CFR 1320.5(a) and 1320.6.

Solicitation of Comments

OSHA published two separate **Federal Register** notices that allowed the public an opportunity to comment on the proposed Information Collection Request (ICR) containing the information collection requirements in the proposed rule for 60 days, as required by 44 U.S.C. 3507). The NPRM provided an initial 30 days for the public to comment on the ICR corresponding to the general comment period for the rulemaking (83 FR 23534), and OSHA published a second companion notice to the NPRM on July 30, 2018 (83 FR 36507), allowing the public an additional 30 days to comment on the information collection requirements contained in the proposal. Concurrent with the proposed rule, OSHA submitted the ICR to OMB for review (ICR Reference Number 201710-1218-002) in accordance with 44 U.S.C. 3507(d).

On July 31, 2018, OMB issued a Notice of Action (NOA) assigning the proposal's ICR a new control number, 1218-0270, to be used in future ICR submissions. OMB noted that this action had no effect on any current approvals. OMB also noted that the NOA is not an approval to conduct or sponsor the information collection contained in the proposal. Finally, OMB requested that, "Prior to publication of the final rule, the agency should provide a summary of any comments related to the information collection and their response, including any changes made to the ICR as a result of comments. In addition, the agency must enter the correct burden estimates."

The proposed rule invited the public to submit comments to OMB, in addition to OSHA, on the proposed information collection requirements with regard to the following:

- Whether the proposed information collection requirements are necessary for the proper performance of the agency's functions, including whether the information is useful;
- The accuracy of OSHA's estimate of the burden (time and cost) of the information collection requirements, including the validity of the methodology and assumptions used;

- The quality, utility, and clarity of the information collected; and
- Ways to minimize the compliance burden on employers, for example, by using automated or other technological techniques for collecting and transmitting information.

OSHA received three public comments³⁸ on the proposed ICR that are addressed in the agency's final ICR analysis. In addition, OSHA received a number of comments in response to the proposed rule, described earlier in this preamble, that also addressed several information collection requirements (primarily the requirement to document evaluations) and contained information relevant to the burden hour and costs analysis in the ICR. Responses to these comments are found above in Section III, Summary and Explanation of the Proposed Amendments to Subpart CC. OSHA considered them when it developed the revised ICR associated with the final rule.

Concurrent with publication of this final rule, the Department of Labor submitted the final ICR, containing the full analysis and description of the burden hours and costs associated with the final rule, to OMB for approval. A copy of this ICR is available at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201809-1218-001 (this link will become active on the day following publication of the final rule). OSHA will publish a separate notice in the **Federal Register** that will announce the results of OMB's review. That notice will also include a list of OMB-approved information collection requirements and total burden hours and costs imposed by the new standard. The Agency will also codify the OMB control number for the standard into § 1926.5, which is the central section in which OSHA displays its approved collection under the Paperwork Reduction Act.

Summary of Information Collection Requirements

This final rule establishes new information collection requirements. It also modifies a small number of information collection requirements in the Cranes and Derricks in Construction Standard (29 CFR part 1926, Subpart CC) Information Collection (IC) previously approved by OMB. If the new information collection requirements are approved by OMB, OSHA will request a second OMB approval to amend the comprehensive Cranes and Derricks in Construction

Information Collection (OMB control number 1218-0261) to incorporate the ICR analysis associated with the final Cranes and Derricks in Construction Standard: Operator Qualification and to discontinue the new control number (1218-0270).

Below is a summary of the major differences in the information collection requirements contained in the revised rule from the information collection requirements previously approved in the ICR. Also, the summary includes a brief description of the significant changes between the proposal and the final rule's information collection requirements. These differences are discussed in more specific detail in Section III: Summary and Explanation of the Amendments to Subpart CC. The impact on information collection requirements is also discussed in more detail in Item 8 of the ICR.

Some of these adopted revisions resulted in changes to the previous burden hour and/or cost estimates associated with the current OMB-approved information collection requirements contained in the Cranes and Derricks in Construction Standard Information Collection. Others did not change burden hour or cost estimates, but would substantively modify language contained in the currently OMB-approved ICR. Still others revised previous standard provisions that are not information collection requirements. This summary addresses the first two categories to ensure that the ICR reflects the updated regulatory text, but does not address the last category of revisions. In addition, this summary does not address the provisions that are substantively unchanged from the current, OMB-approved information collection requirements. Discussion and justification of these provisions can be found in the preamble to the final 2010 crane rule (75 FR 48017) and also in the Supporting Statements for this final rule, as well as in the approved Information Collection.

Section 1926.1427(a)—Operator Training, Certification, and Evaluation

The introductory text in paragraph (a) sets out the employer's responsibility to ensure that each operator is certified/licensed in accordance with subpart CC, and is evaluated on his or her competence to safely operate the equipment that will be used, before the employer permits him or her to operate equipment covered by subpart CC without continuous monitoring. The revised approach provides a clearer structure than the previous standard, which was not designed to

³⁸ See www.Regulations.gov, docket numbers: OSHA-2018-0009-0003; OSHA-2018-0009-0004; and OSHA-2018-0009-0005.

accommodate both certification and evaluation.

Section 1926.1427(c)—Operator Certification and Licensing

Under paragraph (c), the employer must ensure that each operator is certified or licensed to operate the equipment. Paragraph (c) retains the certification and licensing structure of the previous standard with only a few minor modifications intended to improve comprehension of certification/licensing requirements. For example, OSHA removed the reference to an "option" with respect to mandatory compliance with existing state and local licensing requirements that meet the minimum requirements under federal law.

Section 1926.1427(d)—Certification by an Accredited Crane Operator Testing Organization

Revised paragraph (d) retains the requirements of previous paragraph § 1926.1427(b), except that the revision removes the requirement for certification by capacity of crane, as required in previous paragraphs (b)(1)(ii)(B) and (b)(2). The need for this change is explained in the "Need for a Rule" section of the preamble. The revised rule also makes some non-substantive language clarifications. Compliance with the requirements of revised paragraph (d) is the option that OSHA expects the vast majority of employers to use.

Section 1926.1427(e)—Audited Employer Program

The substantive content of revised paragraph (e) is the same as previous § 1926.1427(c). It sets out the parameters for a nonportable certification program administered by the employer and audited by a third party. The changes to the regulatory text for the audited employer program are to remove the word "qualification" and to replace three cross references with updated references to their new locations in the final rule.

Section 1926.1427(f)—Evaluation

Paragraph (f) sets out new specific requirements that employers must follow to conduct an operator evaluation and re-evaluation, including documentation requirements. Paragraph (f)(6) requires the employer to document the evaluation of each operator and to ensure that the documentation is available at the worksite while the operator is employed by the employer. OSHA is adding language to this final rule that states explicitly the documentation must be maintained

while the operator is employed by the employer. This paragraph also specifies the information that the documentation needs to include: The operator's name, the evaluator's name and signature, the date of the evaluation, and the make, model and configuration of the equipment used in the evaluation. However, the documentation would not need to be in any particular format. The employer must make the document available at the worksite for the duration of the operator's employment.

The final rule also permits the employer to rely on its previous assessments of an operator employed by that employer prior to December 10, 2018, in lieu of conducting a new evaluation of that operator's existing knowledge and skills. Thus, for those operators assessed under this provision of the final rule, the evaluation documentation must reflect the date of the employer's determination of the operator's abilities and the make, model and configuration of equipment on which the operator has previously demonstrated competency. The proposed rule did not include the provisions permitting employers to rely on previous assessments of current employees in lieu of conducting new evaluations and the associated documentation.

Section 1926.1427(h)—Language and Literacy

Previous paragraph § 1926.1427(h) allowed operators to be certified in a language other than English, provided that the operator understands that language. Paragraph (h) in the final rule is nearly identical to previous paragraph (h) with the exception that it removes the reference to the previous qualification language in paragraph (b)(2), which has been replaced.

Title of Collection: Cranes and Derricks in Construction: Operator Qualification.

OMB Control Number: 1218-0270.

Affected Public: Private Sector—businesses or other for-profits.

Total Estimated Number of Respondents: 119,904 (117,130 employers of operators and 2,774 employers of propane field technician officers).

Total Estimated Number of Responses: 102,144.

Total Estimated Annual Time Burden Hours: 7,173.

Total Estimated Annual Other Costs (capital, operation and maintenance) Burden: \$84.

D. Federalism

OSHA reviewed the revisions to the cranes standard in accordance with the

Executive Order on Federalism (Executive Order 13132, 64 FR 43255, August 10, 1999), which requires that Federal agencies, to the extent possible, refrain from limiting State policy options, consult with States prior to taking any actions that would restrict State policy options, and take such actions only when clear constitutional and statutory authority exists and the problem is national in scope. Executive Order 13132 provides for preemption of State law only with the expressed consent of Congress. Federal agencies must limit any such preemption to the extent possible.

Under Section 18 of the OSH Act, Congress expressly provides that States and U.S. territories may adopt, with Federal approval, a plan for the development and enforcement of occupational safety and health standards. OSHA refers to such States and territories as "State Plan States." Occupational safety and health standards developed by State Plan States must be at least as effective in providing safe and healthful employment and places of employment as the Federal standards (29 U.S.C. 667).

OSHA previously concluded from its analysis for the 2010 final rule that promulgation of subpart CC complies with Executive Order 13132 (see 75 FR 48128–29). The amendments in this final rule do not change that conclusion. In States without an OSHA-approved State Plan, this revised rule will limit state policy options in the same manner as every standard promulgated by OSHA. But the revised rule also requires compliance with State and local crane operator licensing programs that meet certain minimum standards. Section 18 of the OSH Act, as noted in the previous paragraph, permits State-Plan States to develop and enforce their own cranes standards provided these requirements are at least as effective in providing safe and healthful employment and places of employment as the requirements specified in this final rule.

E. State Plans

When Federal OSHA promulgates a new standard or a more stringent amendment to an existing standard, State Plans must either amend their standards to be identical or "at least as effective as" the new standard or amendment, or show that an existing State standard covering this area is already "at least as effective" as the new Federal standard or amendment (29 CFR 1953.5(a)). State Plan adoption must be completed within six months of the promulgation date of the final Federal rule. When OSHA promulgates a new standard or amendment that does not

impose additional or more stringent requirements than an existing standard, State Plans do not have to amend their standards, although OSHA may encourage them to do so. The 28 OSHA-approved State Plans are: Alaska, Arizona, California, Connecticut, Hawaii, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Michigan, Minnesota, Nevada, New Mexico, New Jersey, New York, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. Connecticut, Illinois, New Jersey, New York, Maine, and the Virgin Islands have OSHA-approved State Plans that apply to State and local government employees only.

The amendments to OSHA's cranes standard in this final rule require employers to permanently implement evaluations of crane operators, whereas the previous evaluation duty had been temporary with a fixed end date. These evaluations must be documented and include more specificity than the previous temporary employer duty to assess and train operators under § 1926.1427(k)(2). Accordingly, State Plans are required to adopt an "at least as effective" change to their standard.

OSHA is also removing the previous requirement for crane operators to be certified by crane capacity as well as crane type. Because this change removes a requirement rather than imposing one, State Plans are not be required to make this change, but may do so if they so choose.

F. Unfunded Mandates Reform Act

When OSHA issued the final Cranes and Derricks in Construction rule in 2010 (75 FR 47906), it reviewed the rule according to the Unfunded Mandates Reform Act of 1995 (UMRA; 2 U.S.C. 1501 *et seq.*) and Executive Order 12875 (56 FR 58093). OSHA concluded that the final rule did not meet the definition of a "Federal intergovernmental mandate" under the UMRA because OSHA standards do not apply to State or local governments except in States that voluntarily adopt State Plans. OSHA further noted that the 2010 rule imposed costs of over \$100 million per year on the private sector and, therefore, required review under the UMRA for those costs, but concluded that its 2010 final economic analysis met that requirement.

As discussed above in Section III.A (Final Economic Analysis and Regulatory Flexibility Analysis) of this preamble, this final rule has cost savings of approximately \$1.8 million per year. Therefore, for the purposes of the UMRA, OSHA certifies that this final

rule would not mandate that State, local, or tribal governments adopt new, unfunded regulatory obligations, or increase expenditures by the private sector of more than \$100 million in any year.

G. Consultation and Coordination With Indian Tribal Governments

OSHA reviewed this final rule in accordance with Executive Order 13175 (65 FR 67249) and determined that it will not have "tribal implications" as defined in that order. The final rule will not have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

H. Executive Order 13771: Reducing Regulation and Controlling Regulatory Costs

Consistent with E.O. 13771 (82 FR 9339, January 30, 2017), OSHA has estimated at a 3 percent discount rate, there are net annual cost savings of \$1,752,000, and at a discount rate of 7 percent there is an annual cost savings of \$2,388,000. This rule is an E.O. 13771 deregulatory action. Details on the estimated costs and cost savings estimates for this rule can be found in the final rule's economic analysis.

List of Subjects in 29 CFR Part 1926

Certification, Construction industry, Cranes, Derricks, Occupational safety and health, Qualification, Safety, Training.

Signed at Washington, DC, on November 5, 2018.

Loren Sweatt,

Deputy Assistant Secretary of Labor for Occupational Safety and Health.

For the reasons stated in the preamble of this final rule, OSHA is amending 29 CFR part 1926 as follows:

PART 1926—SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

Subpart CC—Cranes and Derricks in Construction

■ 1. The authority citation for subpart CC continues to read as follows:

Authority: 40 U.S.C. 3701 *et seq.*; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 5–2007 (72 FR 31159) or 1–2012 (77 FR 3912), as applicable; and 29 CFR part 1911.

■ 2. Revise § 1926.1427 to read as follows:

§ 1926.1427 Operator training, certification, and evaluation.

(a) *General requirements for operators.* The employer must ensure that each operator is trained, certified/licensed, and evaluated in accordance with this section before operating any equipment covered under subpart CC, except for the equipment listed in paragraph (a)(2) of this section.

(1) *Operation during training.* An employee who has not been certified/licensed and evaluated to operate assigned equipment in accordance with this section may only operate the equipment as an operator-in-training under supervision in accordance with the requirements of paragraph (b) of this section.

(2) *Exceptions.* 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) are not required to comply with § 1926.1427. Note: The training requirements in those other sections continue to apply (for the training requirement for operators of sideboom cranes, follow section 1926.1430(c)).

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

(i) For purposes of this section, an operator who is an employee of the U.S. military meets the requirements of this section if he/she has a current operator qualification issued by the U.S. military for operation of the equipment. An employee of the U.S. military is a Federal employee of the Department of Defense or Armed Forces and does not include employees of private contractors.

(ii) A qualification under this paragraph is:

(A) 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.

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

(b) *Operator training.* The employer must provide each operator-in-training with sufficient training, through a combination of formal and practical instruction, to ensure that the operator-in-training develops the skills, knowledge, and ability to recognize and avert risk necessary to operate the equipment safely for assigned work.

(1) The employer must provide instruction on the knowledge and skills listed in paragraphs (j)(1) and (2) of this section to the operator-in-training.

(2) The operator-in-training must be continuously monitored on site by a trainer while operating equipment.

(3) The employer may only assign tasks within the operator-in-training's ability. However, except as provided in paragraph (b)(3)(v) of this section, the operator-in-training shall not operate the equipment in any of the following circumstances unless certified in accordance with paragraph (c) of this section:

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

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

(iii) In multiple-equipment lifts.

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

(v) In multiple-lift rigging operations, except where the operator's trainer determines that the operator-in-training's skills are sufficient for this high-skill work.

(4) The employer must ensure that an operator-in-training is monitored as follows when operating equipment covered by this subpart:

(i) 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:

(A) The operator's trainer is an employee or agent of the operator-in-training's employer.

(B) The operator's trainer has the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use.

(ii) While monitoring the operator-in-training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training.

(iii) 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.

(iv) 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:

(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 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.

(C) 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) *Retraining.* The employer must provide retraining in relevant topics for each operator when, based on the performance of the operator or an evaluation of the operator's knowledge, there is an indication that retraining is necessary.

(c) *Operator certification and licensing.* The employer must ensure that each operator is certified or licensed to operate the equipment as follows:

(1) *Licensing.* When a state or local government issues operator licenses for equipment covered under subpart CC, the equipment operator must be licensed by that government entity for operation of equipment within that entity's jurisdiction if that government licensing program meets the following requirements:

(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 (c)(1)(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.

(v) For the purposes of compliance with this section, a license is valid for the period of time stipulated by the licensing department/office, but no longer than 5 years.

(2) *Certification.* When an operator is not required to be licensed under paragraph (c)(1) of this section, the operator must be certified in accordance with paragraph (d) or (e) of this section.

(3) *No cost to employees.* Whenever operator certification/licensure is required under this section, the employer must provide the certification/licensure at no cost to employees.

(4) *Provision of testing and training.* A testing entity is permitted to provide training as well as testing services as long as the criteria of the applicable

governmental or accrediting agency (in the option selected) for an organization providing both services are met.

(d) *Certification by an accredited crane operator testing organization.* (1) For a certification to satisfy the requirements of this section, the crane operator testing organization providing the certification 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 certification based on equipment type, or type and capacity.

(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 3 years.

(2) If no accredited testing agency offers certification examinations for a particular type of equipment, an operator will be deemed to have complied with the certification requirements of this section for that equipment if the operator has been certified for the type that is most similar to that equipment and for which a certification examination is available. The operator's certificate must state the type of equipment for which the operator is certified.

(3) A certification issued under this option is portable among employers who are required to have operators certified under this option.

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

(e) *Audited employer program.* The employer's certification of its employee must meet the following requirements:

(1) *Testing.* The written and practical tests must be either:

(i) Developed by an accredited crane operator testing organization (see paragraph (d) 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 (d) of this section).

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

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

(D) The audit must be conducted in accordance with nationally recognized auditing standards.

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

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

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

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

(3) *Timing of audit.* The employer program must be audited within 3 months of the beginning of the program and at least every 3 years thereafter.

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

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

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

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

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

(iv) Records of the audits of the employer's program are maintained by the auditor for 3 years and are made available by the auditor to the Secretary

of Labor or the Secretary's designated representative upon request.

(6) *Audited-program certificates.* A certification under this paragraph is:

(i) Not portable: Such a certification meets the requirements of paragraph (c) of this section only where the operator is employed by (and operating the equipment for) the employer that issued the certification.

(ii) Valid for 5 years.

(f) *Evaluation.* (1) Through an evaluation, the employer must ensure that each operator is qualified by a demonstration of:

(i) The skills and knowledge, as well as the ability to recognize and avert risk, necessary to operate the equipment safely, including those specific to the safety devices, operational aids, software, and the size and configuration of the equipment. Size and configuration includes, but is not limited to, lifting capacity, boom length, attachments, luffing jib, and counterweight set-up.

(ii) The ability to perform the hoisting activities required for assigned work, including, if applicable, blind lifts, personnel hoisting, and multi-crane lifts.

(2) For operators employed prior to December 10, 2018, the employer may rely on its previous assessments of the operator in lieu of conducting a new evaluation of that operator's existing knowledge and skills.

(3) The definition of "qualified" in § 1926.32 does not apply to paragraph (f)(1) of this section: Possession of a certificate or degree cannot, by itself, cause a person to be qualified for purposes of paragraph (f)(1).

(4) The evaluation required under paragraph (f)(1) of this section must be conducted by an individual who has the knowledge, training, and experience necessary to assess equipment operators.

(5) The evaluator must be an employee or agent of the employer. Employers that assign evaluations to an agent retain the duty to ensure that the requirements in paragraph (f) are satisfied. Once the evaluation is completed successfully, the employer may allow the operator to operate other equipment that the employer can demonstrate does not require substantially different skills, knowledge, or ability to recognize and avert risk to operate.

(6) The employer must document the completion of the evaluation. This document must provide: The operator's name; the evaluator's name and signature; the date; and the make, model, and configuration of equipment used in the evaluation. The employer

must make the document available at the worksite while the operator is employed by the employer. For operators assessed per paragraph (f)(2) of this section, the documentation must reflect the date of the employer's determination of the operator's abilities and the make, model and configuration of equipment on which the operator has previously demonstrated competency.

(7) When an employer is required to provide an operator with retraining under paragraph (b)(5) of this section, the employer must re-evaluate the operator with respect to the subject of the retraining.

(g) [Reserved].

(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 certification documentation must note the language in which the test was given. The operator is only permitted to operate equipment that is furnished with materials required by this subpart, such as operations manuals and load charts, that are written in the language of the certification.

(i) [Reserved].

(j) *Certification criteria.* Certifications must be based 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 of 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 the suitability of the supporting ground and surface to handle expected loads, site hazards, and 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 securing procedures.

(k) *Effective dates.* (1) Apart from the evaluation and documentation requirements in paragraphs (a) and (f), this section is effective on December 10, 2018.

(2) The evaluation and documentation requirements in paragraphs (a) and (f) are effective on February 7, 2019.

■ 3. Amend § 1926.1430 by:
■ a. Revising paragraphs (c)(1) and (2);
■ b. Removing paragraph (c)(3); and
■ c. Redesignating paragraph (c)(4) as paragraph (c)(3).

The revisions read as follows:

§ 1926.1430 Training.

* * * * *

(c) * * *

(1) The employer must train each operator in accordance with § 1926.1427(a) and (b), on the safe operation of the equipment the operator will be using.

(2) The employer must train each operator covered under the exception of § 1926.1427(a)(2) on the safe operation of the equipment the operator will be using.

* * * * *

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