

**U.S. Department of Labor**

Occupational Safety and Health Administration  
Washington, D.C. 20210



Reply to the attention of:

October 17, 2006

Mr. Edwin G. Foulke, Jr.  
Assistant Secretary for Occupational Safety and Health  
U.S. Department of Labor  
Occupational Safety and Health Administration  
200 Constitution Avenue, NW  
Washington, DC 20210

Dear Mr. Foulke:

The Small Business Advocacy Review Panel (Panel), established in accordance with the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), is transmitting to you this report on the Occupational Safety and Health Administration's draft proposal for Cranes and Derricks.

The Panel consisted of representatives of the Occupational Safety and Health Administration (OSHA), the Office of Information and Regulatory Affairs (OIRA), of the Office of Management and Budget (OMB), and the Office of Advocacy (OA) within the U.S. Small Business Administration (SBA), Department of Labor, Office of the Solicitor (SOL), and was chaired by Robert Burt, Director of the Office of Regulatory Analysis within OSHA. The Panel members and staff representatives included Robert Burt (OSHA/Chair), Noah Connell (OSHA/Directorate of Construction (DOC)), Bradford Hammock (DOL/SOL), Charles Gordan (DOL/SOL), Charles Marasca (SBA/OA), Bruce Lundegren (SBA/OA), Radwan Saade (SBA/OA), Dominic Mancini (OMB/OIRA), Brenda Augilar (OMB/OIRA), John Kraemer (OMB/OIRA), Adrian Corsey (OSHA/ORR), Audrey Roller (OSHA/DOC), Tressi Cordaro (OSHA/DOC), Kathleen Martinez (OSHA/ORR/SBREFA Coordinator).

On August 18th, the Panel was officially convened. On August 29<sup>th</sup> and 30<sup>th</sup> the Panel members, along with the Small Entity Representative (SERs), participated in conference calls providing the opportunity for an open discussion regarding the draft proposal. In addition to the conference calls, the SERs provided the Panel with their written comments.

The complete Panel Report is attached, including major findings and recommendations of the Panel, a listing of participating SERs, and copies of their written comments. SBREFA requires that this Panel Report and its attachments become part of the rulemaking record and be made available to the public through the OSHA docket office.

In closing, the Panel wishes to thank the SERs for their participation in the early stages of the rulemaking process. The Panel particularly appreciates that the SERs took time from their

busy schedules to provide the Panel with comments. Subsequent steps in the rulemaking process will afford additional opportunities for public participation and input.

Sincerely,



Robert E. Burt  
Chairperson  
Small Business Advocacy Review Panel  
Occupational Safety and Health Administration  
U.S. Department of Labor



Thomas M. Sullivan  
Chief Counsel for Advocacy  
Office of Advocacy  
U.S. Small Business Administration



Steven D. Aitken  
Acting Administrator  
Office of Information and Regulatory Affairs  
Office of Management and Budget



Noah Connell  
Acting Director  
Directorate of Construction  
Occupational Safety and Health Administration



Bradford Hammock  
Counsel for Safety Standards  
Office of the Solicitor  
U.S. Department of Labor

**Report of the Small Business Advocacy Review Panel  
On the Preliminary Draft Standard for  
Cranes and Derricks in Construction**

October 17, 2006

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## **Report of the Small Business Advocacy Review Panel on the Preliminary Draft Standard for Cranes and Derricks in Construction**

### **1. Introduction**

This report has been developed by the Small Business Advocacy Review Panel (the Panel) for the preliminary draft OSHA standard for cranes and derricks in construction. The Panel included representatives of the Occupational Safety and Health Administration, the Office of the Solicitor of the Department of Labor, the Office of Advocacy of the Small Business Administration, and the Office of Information and Regulatory Affairs of the Office of Management and Budget. On August 18, 2006, the Panel Chairperson, Robert Burt of OSHA, convened this Panel under section 609(b) of the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) (5 U.S.C. 601 *et seq.*). A list of the panel members and staff representatives with their affiliations is included in Appendix A.

This report consists of four parts. This introduction is Part 1. Part 2 provides background information on the development of the draft proposal. Part 3 summarizes the requirements of the draft proposal and the oral and written comments received from the small-entity representatives (SERs). Part 4 presents the findings and recommendations of the Panel. A list of the SERs is included in Appendix B of this report; a complete copy of the written comments submitted by the SERs is included in Appendix C of this report. In addition, the core of the materials sent to the SERs, the Preliminary Initial Regulatory Flexibility Analysis, is included as Appendix D to this document.

### **2. Reasons Why Action by the Agency is Being Considered**

OSHA estimates that between 64 and 82 construction workers are killed and 263 are injured working around cranes and derricks every year. The draft proposed standard will substantially reduce fatalities and injuries among construction workers and will eliminate significant financial and emotional burdens suffered by family members and many other people associated with these cases. Preliminary estimates by OSHA indicate that as a result of this rulemaking, 37 to 48 fatalities and 186 injuries could be avoided annually by full compliance with the draft proposed standard.

The existing rule for cranes and derricks in construction, codified in 29 CFR 1926.550 (Subpart N), dates back to 1971 and is based primarily on industry consensus standards published from 1967 through 1969. Since 1971, Subpart N has undergone two additional amendments. In 1988 a new paragraph (g) was added to §1926.550 to clarify when employees on personnel platforms may be lifted by cranes. Also in 1993, provision (a)(19) was added to clarify that employees were to be kept clear of about-to-be-lifted or suspended loads. There have been considerable technological changes since those consensus standards were developed. Industry consensus standards for derricks and for crawler, truck, and

locomotive cranes were updated as recently as 2004. A cross-section of industry stakeholders asked the Agency to update Subpart N's requirements, indicating that over the past 30 years there has been considerable change in both work processes and crane technology that have made much of Subpart N obsolete.

In 1998, OSHA's Advisory Committee for Construction Safety and Health (ACCSH) formed a workgroup to review Subpart N. ACCSH charged the workgroup with the task of identifying key issues regarding the operation of cranes and derricks in construction and proposing draft language in anticipation of a future revision of Subpart N. In 1999, ACCSH passed a motion recommending that OSHA consider negotiated rulemaking as the mechanism to revise/update Subpart N. A Federal Register Notice (67 FR 46612) was published on July 16, 2002, requesting nominations for membership on the Committee and comments on the appropriateness of using negotiated rulemaking to develop a crane and derrick proposed rule. On July 3, 2003, OSHA published a Federal Register notice (68 FR 39877) announcing the members of the Committee.

The first C-DAC meeting was held in July of 2003 and over the next 11 months the Committee met ten more times. The meetings were announced in the Federal Register and open to the public. On July 9, 2004, the Committee reached a final consensus (as defined by the Committee's ground rules) on all issues and successfully negotiated a consensus-based document.

### **3. Summary of SER Comments**

#### **Provisions of the Standard**

##### *Scope*

The C-DAC document establishes its scope by a nonexclusive list of covered equipment, a paragraph that addresses attachments to covered equipment, a list of exclusions, and definitions that further describe some of the equipment. Several SERs expressed concern that the document, in their view, does not adequately tailor requirements to equipment of different sizes and hoisting capacities.

One SER (engaged primarily in residential and light construction) stated that OSHA should

consider regulating cranes based on the type of equipment, the working environment, and risk involved. For example, using a boom truck rated at 10,000 pounds lifting [ ] 500 pound roof trusses on a single family home on a 1 acre lot should be regulated differently than a 100,000 pound hammerhead tower crane lifting 5,000 pound steel beams in downtown Washington, DC. The materials are different, the working environment is different, the severity of the accidents are different, and the regulations should take into account these differences.

Several SERs commented that the C-DAC document should not apply to equipment that simply delivers/unloads materials to the ground or on a stack. One SER characterized these as "small unloading devices" that are "not complicated." This SER indicated that, to his knowledge, while ground conditions are a concern with this equipment, accidents have not

been occurring in the course of this activity. He also noted that once the materials are unloaded from the delivery equipment, the movement of the materials thereafter is done by others using other equipment.

The residential/light commercial SER mentioned above also suggested that the scope of the C-DAC document was not sufficiently clear. Specifically, he noted that "construction sites are now populated with multi-purpose or hybrid machines that can do many tasks" and indicated that the scope section does not clearly indicate whether those machines, as well as forklifts that have been adapted to perform hoisting, would be covered. He stated that "[t]he proposal excludes hoisting equipment that has been modified to a non-hoisting use, but it says nothing about conversion in the other direction, from non-hoisting to hoisting." He attached several photographs and descriptions of machines that reflect this concern. In closing, he asked if he would need "to keep two operators on hand, depending on what attachments are on the machine."

Section 1441 of the document sets out a more limited set of requirements for equipment with a hoisting capacity of 2,000 pounds or less. Some SERs questioned the appropriateness of setting 2,000 pounds as the threshold for applying these limited requirements. One SER stated his belief that this threshold was arbitrary. Another SER indicated that the criterion was set too low, and that the requirements in the proposed standard should be tiered based on increasing capacity.

#### Ground Conditions

A number of SERs raised issues related to the provision placing responsibility for ensuring that ground conditions are suitable (as set forth in the C-DAC document) on the controlling entity. Several SERs favored the controlling entity and crane operator having a shared responsibility for ground conditions. In their view, that would allow for greater flexibility when a problem is found and allow for the possibility of more than one solution. Another SER suggested that responsibility for adequate ground conditions should be a shared one between all parties with an expertise in the area while the decision of who is responsible for correcting it should be a contractual one between the parties involved.

Several SERs indicated that, at present, it is common for the controlling entity and crane company to take a shared responsibility approach with respect to ground conditions. They objected to placing sole responsibility for ground conditions on the controlling entity. One SER commented that such a requirement would be difficult to implement because, as a practical matter, it is difficult for a second or third tier subcontractor to get in contact with the controlling entity. Another SER noted that there can be so many contracting layers separating a controlling entity and a subcontractor, the controlling entity may not even be aware that a crane is going to be on the site. One SER more specifically indicated that the controlling entity is typically responsible (contractually) for providing adequate space and "sufficient" ground, while the crane company is typically responsible for outlining the space that is needed. Finally, another SER stated that problems arise for various reasons and in various scenarios over which the controlling entity has no control; as such, he indicated that all parties should be involved in the resolution of ground condition issues.

Another SER stated that in typical residential construction, the owner/operator of the crane takes responsibility for ground conditions. In his view, the controlling entity on a residential construction site does not have the necessary knowledge to do an assessment of ground conditions. Instead, that entity relies on the expertise of the crane owner/operator. This SER also stated that a controlling entity without knowledge of ground conditions is unable to give the crane operator a list of unsafe ground conditions. This same sentiment was echoed by another SER, who stated that a main problem within the industry was general contractors who are unaware of the conditions that are required for a crane to operate on the site, including proper clearance.

Several other owner/operators also indicated that they take responsibility over ground conditions. Specifically, one SER noted his project engineers and superintendents are generally responsible for ground conditions, with their operators providing a final review of the set-up and safety of the situation.

One commenter proposed that section (e) (which would require the crane owner/operator to consult with the controlling entity if the crane operator believes the ground conditions are unsuitable) be removed, believing that it creates confusion as to who would be ultimately responsible for the ground conditions. In particular, he expressed concern over who would be responsible for ground conditions where the employer of the operator or the assembly/disassembly supervisor fails to raise an issue with regard to ground conditions. This SER also recommended that the job should stop if "anyone determines that the ground conditions are questionable."

### Power Lines

The SERs who commented on the provisions designed to prevent cranes from coming too close to power lines generally recommended that OSHA include additional protections beyond those in the C-DAC document.

The C-DAC document provides for several alternatives to ensure that cranes maintain minimum distances from power lines, one of which is the use of dedicated spotters. Several SERs indicated that they currently use dedicated spotters most of the time. One SER noted that he is unaware of cranes being equipped with proximity alarms (another of the C-DAC document's permitted alternatives) and therefore believes dedicated spotters would be used all of the time to comply with sections 1407(b)(3) and 1408(b)(4). Additionally, one SER recommended that the rule require the spotter to have suitable eyesight for effectively gauging clearance distances. This SER believed that the spotter's eyesight should be a minimum of 20:20 without the use of corrective glasses (but not excluding the use of contact lenses). The SER asserted that: (1) to be able to view a .75 inch diameter power line from 40 feet would technically require a visual acuteness of 20:13 but that a minimum of 20:20 should be required, and (2) that glasses could become obscured in the rain and interfere with the dedicated spotters' ability to gauge the clearance distances.

One SER recommended that the proposed standard should prohibit hoisting operations when working near power lines during fog, heavy rain, and from one hour before dusk until one hour after dawn. This SER asserted that lifts at night or dusk need additional lighting to illuminate objects that are difficult to see and that severe fog can reduce the insulating properties of insulating links and tag lines.

In relation to an employer's option to deenergize and visibly ground power lines at the worksite, one SER indicated that the reference to "grounding" is ambiguous.

One SER suggested removing the word "employer" from the power lines sections (1407-1411) because in his experience the power lines are a site restriction and currently the responsibility of the controlling entity. This SER also raised the need to address how the requirements would apply where a lift involves multiple employers. He indicated that the proposed rule should clarify which employer(s) would be required to provide a dedicated spotter and implement encroachment prevention measures.

Another SER recommended increasing the minimum clearance distance in Table A from 10 feet to 20 feet, suggesting that a greater distance is needed because power lines can sway due to wind or sag in the heat later in the day, after distances have been calculated in the morning. Additionally, this SER noted that only a small portion of work is done closer than 20 feet to a power line.

One SER suggested that the provisions regarding power lines in 1407-1411 should be equally applicable to employees performing Subpart V work.

As a means of preventing electrocution, an SER suggested that where tag lines are used, in addition to requiring the lines to be non-conductive, they should be equipped with insulators.

One SER recommended requiring that all power lines be marked with the voltage to allow employees working near power lines to quickly and easily ascertain the minimum clearance distance needed to maintain safety.

### Inspections

The C-DAC document requires inspections of cranes that have had modifications or additions that affect safe operation or that have been repaired or adjusted in a manner that relates to safe operation. In addition, it requires various levels of inspection after assembly, during each shift, monthly, annually, and during severe service.

Several SERs expressed concerns about the clarity of the document's inspection provisions. One SER suggested that the provisions should "be in a spreadsheet format" indicating what needs to be inspected and when. An SER suggested that for clarity, the corrective action specified in the shift inspection provision should be repeated under the monthly inspection provision. Another SER indicated that it was not clear whether booming down would be required as part of the shift inspection and was uncertain as to the meaning of a "visual" inspection and the limitation relative to disassembly. Another concern reflected the

requirement to refer to Section 1416 for corrective action relative to an operational aid. Specifically, the SER stated that the "operational aid malfunction language" was unclear but that the other language was understandable.

With respect to inspections generally, one SER stated that the required inspections would make their operations safer and generally they would not have difficulty doing them. That SER noted that they already have their crane inspected daily, annually (by an outside company), and after "major repairs."

Another SER stated his belief that his company exceeds ANSI inspection requirements; he stated that they already perform and document a shift, project and annual inspection, as well as after equipment modification and repair. He indicated that they did not have a special inspection for equipment that had been idle, but that such equipment is subject to a shift inspection once it is returned to service. A third SER stated that they also follow the ANSI standard or, if a rental crane is used, verify with the crane owner that those inspections have been done.

Another SER noted that they currently perform many of the inspections called for by the C-DAC document. Similarly, an SER noted that he inspects his machines daily, inspects and certifies his cranes annually, and has their "booms recertified after major repairs."

One SER questioned the need to apply these inspection requirements to small residential builders who often lease their cranes, along with operators, from rental firms. According to this SER, small home builders lack the expertise to perform inspections and rely on the crane owner to perform the inspections for these short rentals ("typically one day, sometimes two days") that are often returned to the owner overnight. This SER indicated that he relies upon the "lessor (e.g. owner/operator)" to perform inspections, to comply with ANSI, and does not maintain any related documentation. An SER also suggested that the inspection requirements be adjusted to "match the level of risk inherent with the type and usage of the crane."

With regard to paragraph 1412(a), "Modified equipment," an SER suggested that an exception be added for "transportation systems." This SER stated that the provision could be read to require approval (under Section 1434 - Equipment Modifications) of "any boom dolly, booster, or other transportation system dispersing the weight of the crane for movement on the highways." Another SER stated that a load testing requirement be added to this provision because the modification might have changed the equipment's lifting properties; currently the inspection for modified equipment in the C-DAC document requires "functional testing."

Regarding paragraph 1412(b), Repaired/adjusted equipment, an SER stated that he was concerned about a potential conflict between the provisions in paragraph 1412(b) on "Repaired/adjusted equipment" and Section 1416 on "Operational Aids." A second SER questioned whether a contractor sending a crane to a crane dealer for repairs would have to verify that the dealer's welder is certified.

One SER stated that his company's list of items to inspect during each type of inspection was similar to the items listed in the C-DAC document. Another SER stated that they inspect "60-95% of [those] items, depending on the inspection interval." A third SER noted they are "conducting the appropriate inspections."

The shift inspection provision provides that the inspection begin before the beginning of the shift and be completed before or during that shift. One SER noted that some deficiencies only become apparent after operation has begun (and which would only be detected after the shift has begun) and therefore objected to requiring the shift inspection to take place before the beginning of the shift. This SER noted that ANSI B30.5 provides for frequent inspections including observations during operation for any deficiencies that might appear between regular inspections. He suggested that the proposal should conform to ANSI by permitting the shift inspections to occur by the end of the shift.

Several SERs took issue with some of the items listed in the shift and monthly inspections. An SER suggested that the provision that would require a wire rope inspection to take place during the shift inspection be deleted. This SER believes that this provision exceeds ANSI requirements and is not achievable without lowering the boom, which would be too time consuming. It was also suggested that the inspection of wire rope be conducted during assembly/disassembly, when the rope can be inspected by touch as well as visually. Another SER stated that the inspection of reeving each shift is unnecessary. This opinion was shared by a second SER, who noted that such an inspection was not practical unless the reeving had been changed.

An SER was concerned with the inclusion of ground conditions (1412(d)(x)) in the shift and monthly inspections. He noted that ground conditions are not included in the ANSI inspection, is the responsibility of the controlling entity, rather than the operator or other person, and suggested its removal or its insertion in Section 1402 – Ground Conditions. This SER similarly suggested that the requirement to inspect the equipment for "level position" be removed from the shift and monthly inspections. He noted that this item is not included in ANSI, and is "unclear as to its intent" with respect to when it would have to be level and "tolerances of level."

Another SER stated that it was not necessary to inspect pressure lines and electrical lines at "the start of each shift unless there are obvious leaks or lack of function."

A few SERs questioned the corrective action provision of the shift and monthly inspections. They were concerned about the possibility of down time for "any deficiencies" even if they did not constitute a hazard. However, another SER indicated that the term "deficiency," as used by some people in the industry, implies that there is a safety hazard. In his view, the identification of a "deficiency" would in and of itself give rise to potential legal liability if the employer did not immediately correct it, irrespective of whether it constituted a safety hazard.

Section 1412 specifies that if inspections reveal a deficiency in safety equipment, the competent person must immediately determine whether the deficiency constitutes a safety hazard. If it does, the crane must be taken out of service until the deficiency is corrected. One SER noted that it was sometimes difficult to obtain replacement parts for a crane, in effect suggesting that a delay in obtaining such parts could result in a crane being out of service for an extended period.

Many SERs also expressed concern about several of the items included in the annual/comprehensive inspection (Section 1412(f)). One questioned the need to include paragraphs (f)(2)(xi) and (xiv), with specific reference to the checking of pressure and relief valves. He stated that it is difficult to perform this task onsite and would require time to check the history of the equipment; he also noted that typically a mechanic rather than an inspector would perform any needed repair (suggesting that there could be a delay if a repair was needed).

Another SER suggested changing "checking pressure" to "checking pressure setting" in (f)(2)(xiv)(D) to keep it parallel with ANSI and to avoid having to check the pressure at "each and every line" as opposed to "at the end of the line." This SER also believes that the requirement to inspect (f)(2)(xx), "[o]riginally equipped steps, ladders, handrails, guards: missing" should be removed since he believes that related safety issues are already addressed by paragraph (f)(2)(xxi) and because he believes that it could be construed to require the retention of "original" steps and ladders. He noted that these items are sometimes removed and replaced with "attaching dollies . . . for transport purposes."

Under the C-DAC document, a "competent person" would be required to perform the shift and monthly inspections, while a "qualified person" would perform the annual/comprehensive inspection. The document defines both a "competent person" and a "qualified person." One SER, who states that his company does not currently need to perform annual inspections, noted that their operator performs "frequent" inspections, while monthly inspections are conducted by "key company personnel." He stated his concern about costs if these personnel "would not be considered competent person[s]." Another SER similarly noted that operators perform the daily inspection, while an outside company performs the annual inspection. A third SER noted that this aspect of the draft proposed standard "would not [a]ffect our practices to any significant amount."

Many SERs noted the potential effect of the inspection documentation requirements on their respective companies. Under the C-DAC document, the monthly and annual/comprehensive inspections (but not the shift inspections) would have to be documented. One SER stated that he had only one safety officer, who he wanted "working in the field," as opposed to documenting inspections. Another SER noted that he "would have to increase the amount of recordkeeping we already perform," which would require additional personnel. Similarly, a third SER indicated that although they currently keep monthly inspections documented on daily work records, they would most likely develop a new monthly inspection form. He also noted that they would have to "keep on file copies of annual inspections from the crane owners when we [lease]" and copies of monthly inspections from owners when they lease on a short term. Another SER emphasized that the "biggest change" posed by the C-DAC

document inspections is the additional documentation that he believes would be entailed. He stated that while they keep maintenance records for each piece of equipment, they do not "currently keep documentation of daily site conditions for each crane or daily inspections of each crane." He noted that he moves his cranes frequently each day and does "not record the ground condition for each move."

Another SER similarly stated that under the C-DAC document his company would have to "increase the amount of recordkeeping" they currently perform. In contrast, another SER said he would not need to do anything different than what his company is already doing to meet the documentation requirements of the C-DAC document.

### Operational Aids

Two SERs noted that it is common for employers to have difficulty in obtaining parts for older equipment. One stated that the provision that would require parts for operational aids to be fixed within seven to thirty days is unrealistic. He pointed out that obtaining a replacement operational aid is often extremely difficult for various reasons, including that it can be difficult to obtain a part number and that the part is no longer made or stocked. Often in such cases, the manufacturer does not have a substitute. He recommended OSHA revise all provisions under Section 1416 that put an unfair time burden for older equipment.

An SER asserted that Section 1416 (Operational Aids) conflicts with Section 1412 (Inspections). Specifically, he stated that Section 1412(b)(1), which requires that machines be inspected before the first use after a repair, conflicts with the provisions of 1416.

### Fall Protection

One SER stated that the expanded fall protection requirements in the C-DAC document are unnecessary and that adequate safety measures are addressed in the current Subpart N at 1926.550(a)(13)(i)-(iii) and 1926.550(c)(2). This SER stated that it does not currently use fall protection equipment for its employees; instead, it trains employees to only use areas of the crane designed for walking and to keep those areas free of any slick substance. Another SER similarly proposed that the fall protection requirements remain unchanged from the current Subpart N.

One SER stated that its employees do not use fall protection when walking the cords of a conventional (lattice boom) crane. Otherwise, this SER uses the 6 foot fall protection standard. He stated that when on top of the cab a retractable lifeline with a secure anchorage point is used. Another SER simply stated that it followed current OSHA standards for fall protection.

Four SERs noted, in direct response to a SBREFA Panel inquiry, that the crane booms they have used do not include walkways.

### Operator Qualification and Certification

The SERs expressed a number of concerns with respect to both Section 1427, "Operator Qualification and Certification," of the C-DAC document and Section 1430, "Training." Because operator training and operator certification are related topics, a number of the SER comments pertain to both. The comments that overlap the two topics will be addressed in this section, while those that pertain exclusively to training will be discussed in the next section.

#### Accredited testing/certifying organizations:

The C-DAC document requires that crane operators be certified or qualified for the equipment they operate by one of several means. One way is by an organization that has been accredited by a nationally recognized accrediting agency. A number of SERs believed that this was the only realistic option of the four options listed in the C-DAC consensus document for most small entities and focused their comments on this alternative. One SER advocated that the accrediting agency be required to be an unbiased third party or government entity, to avoid bias in the accreditation process.

Other SERs indicated concerns about the low number of accredited testing organizations currently available. Several SERs mentioned that they were aware of only one accredited testing organization, and were concerned about time constraints on getting operators certified if only one organization were available. However, another SER commented that there was a high likelihood of additional accredited testing organizations coming into existence during the four year implementation period in the C-DAC document.

#### Comments supporting certification:

Several SERs supported the certification/qualification provisions. One based his view on his experience with complying with a third party certification requirement in California, which resulted in his company auditing and making significant changes and improvements to its operator training program. Others based their views on their experiences with their company's voluntary use of third party certification. One of these stated that it had already been through a State-required operator certification process and found the additional training required was beneficial to all operators, including its experienced operators. This SER currently trains its operators in-house and administers the written exam successfully. The SER's operators found this training superior to the training done prior to implementation of the State certification standards. This SER stated it had retained all of its operators through the training/certification process and that proper advance training was necessary to achieve a high passage rate for testing.

Another SER stated that it already requires certification for its crane operator employees. Prior to requiring certification, this SER had experience with in-house training, which had proven ineffective. The SER stated that having a third party audit a training program is

necessary to ensure quality and consistency. This SER also stated that given the increasing complexity of cranes, improved training is critical for safety.

A third SER stated it is currently pursuing third party certification for its operators, with 75% of them successfully certified to date. He supports inclusion of the option provided in the C-DAC document at 1437 (c) (Option 2: Qualification by an audited employer program), which allows employers to use certified testing materials developed by a third party. In his view, use of this option would result in training and certification that is meaningful to parties outside the company. This SER found that its operators had improved in every skill area since the implementation of its current training and testing program.

An SER indicated that both his customers, and several States in which his company works, require certification by the National Commission for the Certification of Crane Operators ("NCCCO") or its equivalent. This SER also indicated that the four-year implementation period included in the C-DAC document would allow for the development of additional accredited certification programs, as well as in-house employer qualification programs.

One SER noted that training requirements for operators have been in place for a long time under the ANSI industry consensus standards. He reported that his company has gone beyond those consensus standards and has already implemented certification and documentation requirements. He stated that, as a result, its operators' competency has improved. In light of his experience, he concluded that training requirements alone are not enough to ensure that crane operators are adequately qualified. Another SER stated that the lack of training for crane operators in the industry is a major problem and fully supports the requirements for training, third party accreditation, and testing.

Three SERs recommended that certification requirements be graduated according to the load capacity of the crane, so that operators handling progressively larger/more hazardous loads would have to meet higher standards of certification.

Several SERs commented that certified operators increased their business and served to reduce potential liability. Many SERs leasing cranes with operators from others mentioned they prefer or even require that the operators be certified.

Comments favoring training but opposing certification:

Many SERs indicated that certification does not, standing alone, contribute to a safe work environment, and that emphasis should be placed on training rather than certification. One SER recommended exempting certain small businesses from certification. In lieu of certification, these businesses would be required to prove the safety and training provided was adequate for their operation and equipment. This SER also recommends exempting experienced operators from certification/qualification by "grandfathering" operators with a number of years of experience.

One SER indicated that his company has a policy that, before an employee is permitted to learn how to operate a crane, that person must operate every other piece of equipment that

they use for many years. He assesses that person's ability to operate a crane based on knowing that particular employee's capabilities and qualifications based on years of observation. This SER does not have any operators who have been certified by a third party. He believes that, for small companies like his with special knowledge of each employee's abilities, which a large company may not have, it would be more appropriate for the proposed rule to emphasize training and qualification rather than certification. He also indicated that his company leases cranes with operators for all heavy lifts.

One SER stated that it currently trains its operators using a local university-affiliated training program, which includes a professional instructor who provides the employer with an assessment of each trainee's skill level. This SER also indicated that the certification requirement in the draft proposed standard was too burdensome for a small business owner.

One SER recommended that in lieu of certification, OSHA should publish standards to guide an employer's minimum training program, including the use of a commercial school or university training program to meet the training requirements for its operators. Another SER recommended the use of existing "third party institutions of learning, such as the USDA Cooperative Extension Service, U.S. Army Corps of Engineers, or TEEEX as an option for training and qualification of crane operators instead of the certification requirements in the C-DAC document."

Several SERs recommended a certification requirement similar to that described in 29 CFR 1910.178(l), the General Industry qualification program for powered industrial truck (e.g., fork lift) operators. Under that standard, an employer certifies its own powered industrial truck operators based on criteria set out in the standard.

One SER indicated that his company owns one crane and employs one crane operator trained specifically for that crane and for the types of loads for its business operation, which is primarily light duty building construction. This SER believes the addition of a written certification examination to the employee's training would not improve safety and would require him to lay off the operator.

An SER recommended that the certification requirement be replaced with an employer qualification and training program to produce trained operators targeted to the specific operations the operator will be doing and to the specific equipment the employee will be operating. This SER also stated that it would be more beneficial to have frequent and focused training based on an employer's requirements instead of those in the C-DAC document.

One SER indicated that when he leases a crane and operator from a crane rental company, he insists on third-party certification of that operator, because he has not worked with that operator enough to trust that the operator has been sufficiently trained. This SER distinguished these lifts from those in which he works with his own operators, whom he has personally supervised in both training and actual operation. For his own employees, this SER felt that internal qualification procedures are adequate.

Literacy/language barrier issues:

Many SERs indicated that the literacy/language proficiency that would be needed to pass the written certification test could make it burdensome for employers who have operators who are illiterate or are unable to read or speak English. One SER indicated that a loss of experienced operators due to such a requirement could increase unsafe conditions on worksites by requiring the use of less experienced crane operators.

One SER indicated that his company's research showed that most manuals provided by manufacturers are available only in English, and that most manuals that were available in another language were available only in one other, German. However, another SER stated that two crane manufacturers provide operator manuals in Spanish.

Other comments on certification:

One SER indicated that clarification is needed about the types of certification available, and what equipment might be covered by various levels of certification. Specifically, the SER raised the issue of whether certification would be by crane model or if it would apply to all crane types, comprehensively. One SER suggested defining the word "type" of crane as it is used in 1427 (b)(ii)(B) and as it relates to operator certification. This SER noted that the use of the phrase "equipment capacity and type" in this provision is unclear as to whether it would require operator certification for every make and model of crane or certain crane "types" similar to those set out in ANSI B30.5-3.1.2. To the extent the intent of this provision is to be similar to ANSI, this SER recommended that the ANSI B30.5 figures be included in the proposed standard where different levels of operator certification are required for "equipment type."

One SER, whose company is engaged in duty cycle work that primarily uses drag lines, was concerned that the C-DAC document would require crane operators to demonstrate competence with respect to issues rarely or never encountered in this type of work, e.g., power lines.

An SER expressed concern that five years might be too long a duration for a certification, citing physically and mentally disabling conditions which might occur in a shorter period of time. This SER recommended that certification be valid for two years, with a written retest every year, and that provision be made to withdraw an operator's certification if the employee becomes disabled.

One SER recommended that operators be re-evaluated, not re-certified, after the initial certification is completed, because a less comprehensive examination might save time and resources. In addition, this SER recommended that operators should be retrained and retested after an incident or "near miss."

An SER indicated that a physical examination not unlike that required for commercial driver's licenses should be required as part of the certification/qualification exam.

An SER suggested that the provision on crane operator certification/qualification might be more easily complied with if OSHA provided an option by which operators could take certification examinations verbally.

## Training

### Operator training

The C-DAC document requires that operators be trained in certain topics relevant to safe operation. As discussed in the section on operator certification, even those SERs who opposed the certification requirement believed that operator training was important to the safety of crane operations. Some, however, opposed certain training requirements in the C-DAC document. One SER indicated that the C-DAC training provisions are too broad considering the broad range of crane load capacity, worksite conditions and crane types -- that the risks presented by tall, 350-ton lattice-boom cranes are very different compared to those from small, limited reach cranes used for light construction. This SER currently leases cranes and operators and believes that the training requirements in the C-DAC document would make it too difficult for it to hire and train its own operators. Two other SERs also stated that the training requirements in the C-DAC document are too broad and cover too many types of operations that are not relevant to a small business.

One SER recommended using the forklift training standards at 29 CFR 1910.178(l)(the powered industrial truck training standard) as a model for crane operator training requirements. Another SER recommended use of that standard as a model for cranes with a capacity of less than 20 tons and with a less than 85 foot extension. Another recommended that training should be specific to the equipment and worksite conditions and consist of 3 elements: formal instruction; practical training; and evaluation of performance in the workplace.

The C-DAC document does not specify who must conduct the training and thereby permits an employer to conduct its own training program or to have its operators trained by an outside entity. One SER uses an outside training agency and augments that training with internal training and retraining. Another has its in-house competent persons train operators initially and later sends the operators to outside professionals for training and certification. A third uses a university-affiliated training program.

Two SERs indicated that if a supervisor is overseeing an operator during the operator's pre-qualification period (per C-DAC section 1427(f)), that supervisor should be adequately trained with respect to both the operation of that equipment and in the proper oversight of an operator in training.

One SER recommended elimination of 1427(a)-(e) and instead using 1427(j) as guidance for training requirements.

One SER indicated that the operator training requirements in the C-DAC document are "directly aligned with ANSI" and as a result, the elements for operator training are currently the industry standard for which employers should already be in compliance.

#### Signal person training

Three SERs indicated they currently use on-the-job training for the signal person. Another SER indicated it conducts its own training and includes demonstration of hand signals in assessing the employee, but does not use a written test.

Another SER uses ANSI A10.42 for Qualified Rigger training for signal persons, which is then documented. Another SER uses the Texas A&M Rigger Training program for signal persons.

One SER asked the Agency to clarify which employer would be responsible for qualifying the signal person on jobs where the crane has been rented.

#### Floating Cranes & Land Cranes on Barges

One SER stated that his company would be unable to comply with the requirement of Section 1437(n)(2) in the C-DAC document for rated capacity modification with respect to land cranes/derricks used on barges. This SER noted that for the duty cycle work performed by its cranes there are no experts qualified to do the calculations for the rated capacity modification as required by this section.

#### Side Boom Cranes

One SER recommended that small side boom cranes not capable of lifting above the height of a truck bed and with a capacity of not more than 6,000 pounds be exempt from Section 1440. In light of the fact that these machines are performing such limited functions, this SER felt that small side boom cranes should not be covered by the proposed rule.

#### Drug Testing and Physical Qualifications

The C-DAC document does not include provisions regarding drug testing or physical qualifications for crane operators. Some SERs believed there should be such requirements. One SER asserted that there has been an increase in drug abuse in construction. Several SERs suggested that drug testing and physical exams are key components to safe crane operations and employee safety and should be included as proposed requirements. Many of

the SERs indicated they already have their own policies covering drug testing and physical examinations.

One SER suggested that operators be required to provide evidence of passing a commercial drivers license (CDL) medical examination. Similarly, other SERs suggested that construction employers be required to follow requirements similar to the U.S. Department of Transportation's physical examination and controlled substance abuse and alcohol testing program.

### Clarity of the C-DAC Document

#### General comments on clarity

Some SERs commented that the C-DAC document is too long, making it onerous to deal with for a small business. These SERs voiced concern that its length would inhibit timely implementation because small businesses like theirs lack personnel who could devote time to outlining the standard's requirements in a concise manner. Several of these SERs worried or believed that they would need to hire additional personnel in light of the draft proposed standard's length and complexity.

Several SERs commented that the C-DAC document as a whole is not difficult to comprehend. However, one SER voiced concern that the document uses very complex language, rather than user-friendly layman's terms. Another SER felt that, because various sections in the document refer to other sections, the document is difficult to read.

#### Clarity of specific C-DAC sections

In discussing the C-DAC document's length, one SER provided a specific example of changes that, in his estimation, unnecessarily lengthened the document. The SER questioned the expansion of Section 1423 (dealing with fall protection) to a length of three and one-half pages when, in his estimation, the existing 1926.550(a)(13)(i-iii) and 1925.550(c)(2) provided more than adequate protection in only four paragraphs of written text.

One SER suggested that the inspection provisions in Section 1412 should be incorporated into a spreadsheet detailing what needs to be inspected and when each inspection must occur. The SER stated that employers could create spreadsheets themselves, but that for small businesses, spreadsheet development would be time-consuming and cause further delays before full compliance.

Similarly, another SER commented regarding Section 1412 that the operator aid malfunction language was difficult to comprehend, but that the rest of the corrective action provisions were clear.

One SER noted that in Sections 1416(d) and 1416(e) the word "days" should be defined as either calendar days or business days.

## Documentation

### General comments on documentation

Several SERs indicated that the provisions of the C-DAC consensus document would increase their companies' documentation and recordkeeping obligations. One SER felt that the only purpose that the added documentation would serve would be to provide "ammunition for lawyers to use" in the event that an employer did not fully comply with the requirement. Another SER questioned not only the amount of added documentation, but also its correlation with increased employee safety, if any. This SER cautioned that the additional documentation would have to be organized, causing companies to expend time and resources on excessive paperwork; furthermore, the SER expressed concern that the documentation requirements "will not enhance worker safety in any way."

An SER whose company already documents inspections, signal person training, crane operator certification, and operator training, commented that the record-keeping provisions in the draft proposed standard are clearly stated and much needed in the industry. This SER suggested that additional documentation requirements be added; specifically, a national database in which employers could report and search operator-caused accidents in order to check prospective employee work history.

### Requests for clarification regarding when documentation is mandated

Several SERs asked for clarification about which sections mandate documentation. One SER stated that the standard should be more specific in places where it requires documentation and recordkeeping. Another SER recommended using "plain language" at each juncture where the proposed standard requires documentation; this SER suggested the specific phrase "records shall be kept" at each part in the standard instead of "employer must" or "employer shall." This SER believed that, as written, the C-DAC document's "ambiguous language" only implies that documentation is required.

Similarly, another SER felt that phrases such as "employer must determine" and "employer must demonstrate" constitute implicit documentation requirements. This SER counted 154 such instances and identified each instance where documentation would be required either directly or indirectly.

One SER expressed concern that record-keeping changes will necessitate the implementation of a monthly inspection form, storage of such forms, and create an obligation to obtain copies of annual inspections from the crane owners when the company leases cranes.

Finally, an SER was of the view that, as a result of the C-DAC document requiring shift inspections, employers would have to make daily recording of site conditions for each crane and daily recording of each crane's inspection findings. Although Section 1412(d) (Shift

Inspections) does not specify that the shift inspections be documented, the SER was of the view that, as a practical matter, to protect against potential legal liability in the event of an accident, the employer would nonetheless have to document them. This SER's company sometimes moves cranes up to 20 times in one day; therefore, he believes that he would have to record the ground conditions after each move.

### **Description of Affected Small Entities**

The SERs included employers that rented cranes to others as their primary business; that owned their own cranes; and that leased cranes with and without operators from others.

Some SERs commented that the PIRFA ignored the characteristics, practices, and requirements of the residential homebuilding industry, especially the single-family construction industry. According to Table 3 of the PIRFA, these industries fall into the "Own and Rent" category. While this industry overall was not assumed to lease cranes only, it was included in OSHA's industrial profile. SERs noted that short term leasing of cranes was quite common in this industry.

Some SERs that solely unloaded materials using crane trucks asked whether their operations were covered by this draft proposed standard, and noted that their operations had not been included in the industrial profile or cost estimates.

OSHA estimated that there is an average of four crane jobs per year for each crane in use. One commenter stated that their company does about 20 to 30 projects per year. This commenter continued in stating that their company owns 9 cranes resulting in 800 days of usage per year. Another SER estimated about 12-20 jobs per year, with 1-2 weeks usage per job. Another stated that his company does about 77.2 jobs per year (average job length of 2 days); and that his company has 29 mobile cranes and 45 operators. This same commenter estimates 2.5 million jobs for the industry. Yet another SER commented that in 2005, his company performed 2,531 jobs. Lastly, one commenter stated that his company does about 24 jobs per year with a crane or derrick on site typically six weeks.

One SER stated that his company does not presently own any cranes. Another SER stated that his company owns 9 cranes, 9 operators (lost one operator in the past 5 years) and does not rent its cranes. One SER stated that his company owns 1 small crane, 1 operator (with no turnover) and does not rent it out. Another SER (a crane rental company) stated that his company has 11 cranes averaging about 12-15 full time employees and 2-4 part time employees.

## Costs and Economic Impacts

### General Comments

One SER stated that “the document is flawed in that all the underlying data is not sourced in many of the areas.”

As noted above, SERs generally noted many more crane jobs per crane per year than OSHA estimated, and stated that OSHA neglected firms renting cranes from others in the home building industry and crane trucks that unloaded materials on construction sites. Both of these comments have general effects on the estimates of costs and economic impacts.

### Costs Associated with Ground Conditions

The Agency estimated that the draft proposed standard would add 30 minutes of supervisory time to assure adequate site assessment. One commenter stated the many tiers of contractual management to reach the general contractor or controlling entity makes this requirement costlier than OSHA’s PIRFA estimate. One SER stated that “...OSHA has created a potential need to document almost every list. This could require hours of time not thirty minutes.” Another SER stated that it would be doubtful that 30 minutes may be sufficient for the supervisor’s time to assess the site conditions and more than the supervisor should be involved in the assessment. According to one SER, this assessment would cost from \$447.14 to \$1,170 should the crane already be on site. This comment was addressed by another SER who stated “this cost is part of normal operations.”

One SER commented that adding 30 minutes of supervisory time to assure adequate site assessment is not the issue; rather the whole team needs to have input to assess the operations, including the crane operator. Another SER stated that it is not feasible for the general contractor’s superintendent to perform site assessment; rather the owner/operator of the crane is in the best position to conduct this assessment, with possible coordination with the general contractors/controlling employer. Another SER commented that there is no additional time to implement the standard, however if paragraph (e) remains there would be an additional 2 hours per job for review of site conditions by the crane company. This commenter felt that paragraph (e) confuses the otherwise clear standard by indicating only one of many possible solution paths to poor ground conditions and creates ambiguity as to who is ultimately responsible for the ground.

One SER provided the following perspective:

Often, the general contractors (OSHA has defined them as the “controlling entity”) do not have prior knowledge that a crane will be on a jobsite. For example, a framing subcontractor may set roof trusses in one of three ways: 1) hire a crane to hoist the trusses, 2) use a forklift, or 3) lift them by hand/manpower-and may use a different method depending on the accessibility of equipment.

Another SER stated that control of ground conditions should be given to the controlling contractor, due to the lack of control and power the crane company would have on any given site.

#### Costs Associated with Assembly/Disassembly

According to one SER, the operator and project supervisor are responsible for assembly and disassembly of equipment. Another SER stated that their crane does not require breaking down for travel. According to another SER, the operator, a mechanic, and a project supervisor are responsible for assembly and disassembly. It appears to be the consensus for companies that lease cranes to rely on the crane rental company for assembly and disassembly.

According to one SER, their equipment does not have instruction manuals available. This SER also added that they train all their operators on how to assemble and disassemble their cranes.

#### Costs Associated with Power Line Safety

One SER stated that as high as 50% of its jobs could be closer than 20 feet of power lines. The commenter continued by adding that the typical job would work within 20 feet of a power line for 20 days; and less than 25% of its jobs require them to work within 10 feet of power lines (these jobs average 2 days). According to another SER, power line safety issues are left to the crane rental company (crane owner and operator) to check these conditions. Another SER stated that 7.3% of their jobs per year are within 20 feet of power lines, and 0.04% of its jobs per year are within 10 feet of power lines. This commenter also added that he was not aware of any cranes that are equipped with proximity alarms and therefore believes that spotters would be used 100% of the time.

Another SER provided the following information:

“There is great variation in power line situations. This year we have had no power line conflicts but other years we have had three or four in a year. Over twenty years we have only been within ten feet once and the power company was able to cut the power during the construction time.”

One SER made several comments on the injury data presented in the PIRFA. According to this SER, “PIRFA P3, quotes 37 to 48 fatalities, however well supported evidence on Federal Register, (S030 47, 47-1), estimates 58 CPLC fatalities alone.” (The estimates of 37 to 48 are the estimated reductions in fatalities from complying with the draft proposed rule.)

According to one SER, power line safety requires training of personnel in awareness and procedure. This commenter also stated that safety personnel are on site full time when work will be performed around a power line and that all procedures are reviewed and followed

throughout the construction. Another SER stated that it uses various methods depending on the site conditions and project requirements.

One SER provided this rationale:

“When our projects involve working closer than 20 feet of power lines, each day begins with a safety briefing of the entire crew emphasizing the safety rules. We include in these meetings the minimum distance standards, handling a load when near power lines, and emergency procedures. The ANSI standards are minimum standards for our personnel. Additionally we will choose not to accept work near power lines when working near the power line is not absolutely necessary.”

According to one SER when its employees work closer than 10 feet of a power line it holds a meeting with all employees to review the related safety rules before beginning work on the project. This SER continued by stating that it establishes “no swing” zones, marking boundaries of these zones with safety fencing and signs and assigns a spotter to stay in communication with the operator to keep the crane boom out of the swing zone. Other SERs stated that the power line would either be de-energized or relocated until the project is completed.

According to one SER, all of this analysis is part of its personnel doing their **normal** job. Another SER stated that OSHA has failed to recognize the logistics of a power line situation and that meetings are held, planning done, and preparations made. This SER continued to state that often the utility company adds additional costs through delays and that the cost of this preparation is substantial and not accounted for by OSHA; also that each job is specific and it would be irresponsible to generalize on the costs to do this work. Lastly, one SER stated that OSHA’s cost estimates are too low and that OSHA omits, necessary travel time, support equipment, or the wage established is too low. This SER continued by saying based on its payroll costs and the local wage rates OSHA has underestimated the wages by 20% to one hundred and fifty seven percent (157%). Also, OSHA did not include the cost of time spent waiting for a power company owner/operator to provide the employer with information on the line or to inform the employer of the line’s energized status.

#### Costs Associated with Inspections

One SER stated that it currently performs many of the inspections that are included in the draft proposed rule with the major difference being the documentation requirements. Another SER stated that its operators inspect their machines daily, its cranes are inspected and certified once per year by an outside company, and its booms recertified after major repairs.

Another SER added the following:

“We do not believe the proposed standard should dictate that inspections should be performed prior to each shift. Not only do some deficiencies only become apparent after operation, but there is also a lack of time to implement remedies without impacting the work

and thereby putting the operator in a difficult situation. ANSI B30.5-2.1.2 states that frequent inspections include 'observation during operation for any deficiencies that might appear between regular inspections.' We would strongly recommend aligning 1412(d) with ANSI."

One SER stated that the required inspections would make its operation safer and his company would not have difficulty accepting them.

#### Costs Associated with Fall Protection

According to one SER, its machines are equipped with handholds, grab rails, railings and slip resistant surfaces. This SER continued by stating that some of the equipment is manufacturer installed and some have been added by the employer; these include grab rails and nonskid surfaces at cab access and egress, walkways and railings around the entire cab. Another SER stated that its fall protection devices include some factory installed and some by its company; and none of its crane booms have walkways. Another SER stated that none of its cranes have fall protection on the booms, but do have fall protection on the working and walking surfaces of the crane. This SER continued by stating that its company does require fall protection equipment where applicable on its projects.

#### Costs Associated with Operator Certification and Qualification

Many SERs felt that the estimates for operator certification were much higher than those estimated in the PIRFA. One SER estimated as much as \$2,900 to train and certify one operator. Another SER commented "for an investment in our operators of approximately \$2,000 per student over the course of a five year certification, costing less than \$8 per week, you can not match the level of safety awareness or confidence with any other program out there." According to one SER, the total cost for the initial certification is \$114,890.79 per operator.

One SER believed the costs for operator certification are overstated and provided the following perspective:

"We believe that the arguments for costs of the draft proposal related to written examination covering operational characteristics which demonstrates the ability to read, write, comprehend and use arithmetic and a load/capacity chart in the language of the crane manufacturer's operation and maintenance instruction manuals to be moot. To be blunt, this is already a requirement under ANSI. The only area where it seems the draft proposal goes beyond ANSI is the requirement of the qualifications of the entity or individuals who confirm the operator meets the requirements. It is our belief that this requirement actually creates a savings for employers who are currently implementing the ANSI standards and a less expensive alternative to employers who aren't."

Some SERs argued that OSHA had neglected the productivity costs of having a crane operator away from work, e.g., that the absence of a crane operator would cause all work

needing cranes to come to a halt and thus result in costs far in excess of the costs of the crane operator.

#### *Economic Impacts Associated with Operator Certification*

Some SERs in the business of renting cranes with operators to others felt that the certification requirements would improve their businesses, even though most felt it was likely to result in increased wages for crane operators. One SER from California who had experienced the implementation of certification requirements stated that these requirements had turned out well for his business.

SERs that owned and operated their own cranes or leased cranes from others were concerned that certification would significantly raise the costs of renting cranes, the pay of crane operators, and result in loss of work of experienced crane operators for such reasons as lack of training on all the cranes covered by certification examinations, inability of crane operators to handle written examinations, and inadequate English language ability.

One SER estimated that the California certification requirement had resulted in changing the hourly pay of crane operators from \$15 to \$18 per hour. Another SER pointed out that such a pay increase would result in cost to firms leasing cranes with operators far in excess of OSHA estimated impacts.

#### *Costs Associated with Documentation Requirements*

One SER stated his company currently keeps documentation of employee craft and safety training, drug testing, health physicals, equipment inspections and repairs, safety violations and near misses. This SER continued by stating "additional costs of documentation will be incurred because all this documentation will have to be organized to comply with the proposed regulation and will not enhance worker safety in any way." In this same SER's oral presentation, he stated that his company has many older machines without operating manuals and procedures. He later asked: "How can we adjust the manufacturer's specifications?" He also suggested grandfathering existing equipment.

Another SER stated the following:

"Our company already complies with many of the record-keeping requirements. We keep personnel files which document training, safety record, drug testing, and other employee information and history. We keep maintenance records on each piece of equipment documenting repairs and upkeep. We do not currently keep documentation of daily site conditions for each crane or daily inspections of each crane. We sometimes move a crane twenty times in one day and we do not record the ground conditions for each move. The documentation for this proposed standard will require substantial additional administration and added cost."

Another SER stated "cut the paperwork; grandfather existing programs, and older cranes." In agreement with this, another SER stated the paperwork will be much more and a

substantial cost; and that they already have a lot they have to do for DOT. He continued by stating that documentation for older cranes can be very difficult to attain, and there may be an increased liability on mechanics.

### **Duplicative and Overlapping Regulations**

Some SERs were concerned that it was not clear whether certain powered industrial trucks fell within the scope of the powered industrial truck standard or this draft proposed standard.

While not seeing a problem of conflicting rules, many SERs urged OSHA to study the costs, economic impacts and safety effects of California's recent implementation of operator certification requirements.

### **Regulatory Alternatives**

Most SERs seemed to support the document as a whole but raised concerns with specific sections within the C-DAC document, such as the scope and operator certification. These comments were discussed in the Provision by Provision section above. In light of the comments made by the SERs, the Panel has developed additional suggested alternatives addressing these issues in Section 4.

## **4. Panel Findings and Recommendations**

The draft proposal presented by OSHA to the Small Business Advisory Review Panel is a proposed rule developed by and reflecting a consensus reached by the C-DAC negotiated rulemaking advisory committee which was chartered pursuant to the Negotiated Rulemaking Act of 1990 (5 U.S.C. Sec. 561 et seq.). Section 563(a)(7) of that Act states:

the agency, to the maximum extent possible consistent with the legal obligations of the agency, will use the consensus of the committee with respect to the proposed rule as the basis for the rule proposed by the agency for notice and comment.

However OSHA may, in the preamble to the proposed rule, present alternatives to the negotiated rule and in issuing a final rule it may, based on the evidence and comments, adopt the alternatives presented. Therefore, the recommendations of the Panel will be presented as suggestions for discussion in the Preamble for public consideration and possible adoption depending on the evidence and comments received during the notice and comment period of the proposed rule

### **Description of Affected Small Entities**

Some SERs reported that they were unable to follow the derivation of the estimates of the number of affected small entities. The Panel recommends that OSHA provide full documentation for this and all other calculations and estimates provided in the PIRFA. (As a first step, OSHA has supplemented the PIRFA sent to the SERs with additional documentation and attached this documentation to this Report.)

SERs also questioned the accuracy of the description of affected small entities. Homebuilders argued that cranes are much more extensively used in homebuilding than estimated by OSHA. Users of truck cranes used solely to unload material on site were concerned that their cranes might be covered by the draft proposed standard. In many circumstances, such cranes are not covered, but there are some circumstances where they may be. Almost all SERs who commented on the topic agreed that OSHA's estimate of the number of crane jobs per crane was much too low. The Panel recommends that OSHA reexamine its estimate of crane use in home building, the coverage of crane trucks used for loading and unloading, and the estimates of the number of jobs per crane. Changes in these estimates should be incorporated into the estimates of costs and economic impacts.

### **Costs and Economic Impacts**

Many SERs felt that OSHA had underestimated the direct costs associated with obtaining certification of crane operators. Among the costs they felt were omitted were costs of associated medical examinations, travel, and travel time, and adequate time for training. Some SERs may not have realized that OSHA did not include costs of training already required by existing standards. The Panel recommends that OSHA review its cost estimates for operator certification and seek comment on these cost estimates.

Some SERs in the business of renting out cranes with operators felt that certification of operators had been or would be good for their business—reducing their liabilities, improving safety, and increasing the desirability of using specialty crane rental firms. Many SERs in other lines of business were concerned that there would be significant economic impacts associated with operator certification. They were concerned about reports of substantial increases in the wages of operators; and the possibility of increased market power for firms renting out cranes; and loss of jobs for existing operators due to language, literacy, or knowledge problems. The Panel recommends that OSHA carefully examine these types of impacts, as well as the direct cost of operator certification, and seek comment on these types of impacts. The Panel also recommends that OSHA consider studying the impacts of the implementation of operator certification in California.

Some SERs were concerned that OSHA had underestimated the time required for assessing ground conditions, failing to realize the number of persons involved in this assessment and the amount of coordination required. OSHA notes that assessing site conditions are necessary for the safe operation of cranes; OSHA assumes that some form of assessment is already being done. While this provision itself is new, performing this assessment is believed to be a usual and customary business practice. The Panel recommends that OSHA reexamine this issue; clarify the extent to which such assessments are currently being conducted and what OSHA estimates as new costs for this rule represent; and seek comments on OSHA's cost estimates.

Some SERs were concerned that OSHA might have underestimated the additional time associated with documenting inspections (though most agreed that the required inspections were necessary and appropriate). A few SERs were concerned that the C-DAC document contained many statements that "the employer shall ..." and that a careful employer would

need to document all such instances, and that OSHA had taken no costs for such documentation. OSHA notes that it cannot cite an employer for failing to have documentation not explicitly called for in a standard. The Panel recommends that OSHA carefully review the documentation requirements of the standard, including documentation that employers may consider it prudent to maintain; estimate the costs of such requirements; seek ways of minimizing these costs consistent with the goals of the OSH Act; and solicit comment on these costs and ways of minimizing these costs.

Some SERs argued that certain inspections required procedures not normally conducted today, such as lowering and fully extending the crane and inspections before use of the crane. The Panel recommends that OSHA examine whether such additional requirements exist, the costs of such requirements, and seek comment on these issues.

Some SERs were concerned that they could not meet the requirements for either original load charts or full manuals. The Panel recommends that OSHA consider the costs of these requirements, and solicit comments on such costs.

Some SERs were concerned that they could not follow or reproduce the benefits analysis OSHA provided. The Panel recommends that OSHA provide full documentation for the analysis and assure that it is reproducible by others. (Note: After the start of the Panel, OSHA placed additional material used in the benefits analysis in the docket for this Panel.)

### **Provisions of the Proposed Rule**

#### *Scope*

An SER noted that the C-DAC document does not contain a provision explicitly excluding coverage of machines originally designed to function primarily as fork lifts that are modified to perform tasks similar to equipment (cranes and derricks) covered by the C-DAC document. The Panel recommends that OSHA consider and solicit public comment on whether the scope language should be clarified to explicitly state whether forklifts modified in that manner would be covered.

#### *Ground Conditions*

One SER was concerned that Section 1402(e) was confusing in its allocation of responsibility for ensuring adequate ground conditions. In particular, this SER questioned the relative responsibilities of the controlling entity, and the employer of the individual supervising assembly/disassembly and/or the operator. Several SERs suggested that the controlling entity and the crane owner/operator should share responsibility for ensuring adequate ground conditions. The Panel notes that Section 1402(e) does provide for shared responsibility between the controlling entity and owner/operator by outlining the obligations relative to ground conditions placed on each. The Panel recommends that there be a full explanation in the preamble of the sharing of responsibility.

## Inspections

### Clarity:

An SER was concerned that the requirements regarding corrective action for monthly inspections was unclear. The monthly inspection provisions, with respect to corrective action requirements, incorporate by reference the corrective action requirements that are in the shift inspection. The SER recommended that these be repeated in the monthly inspection paragraph. The Panel recommends that OSHA restate the applicable corrective action provisions (which are set forth in the shift inspection) in the monthly inspection section.

An SER questioned the degree of scrutiny required for the shift inspection. In particular he indicated that it was not clear whether booming down and removal of inspection plates would be required, and did not understand the limitation relative to disassembly. The Panel believes that there could be potential cost savings if booming down were not routinely required and recommends that OSHA solicit public comment on ways to clarify this provision in these respects. Specifically, OSHA should consider and ask for public comment on whether, and under what circumstances, booming down should be specifically excluded as a part of the inspection, and whether the removal of non-hinged inspection plates should be required.

### Modified equipment

An SER suggested that the modified equipment section be changed to add an exception for transportation systems. The Panel recommends that OSHA solicit public comment on whether to include such an exception and, if so, what the appropriate terminology would be.

### Shift/monthly inspection

An SER stated that the shift inspection should not have to be performed prior to (as opposed to during) each shift. The Panel notes that 1412(d)(1) already permits the shift inspection to be completed during the shift. The Panel recommends that OSHA explain this issue in the preamble.

An SER suggested deleting the requirement to inspect equipment for "level position" because, among other reasons, the amount of tolerance that would be considered within "level" is unclear. The Panel recommends that OSHA solicit public comment about whether it is necessary to clarify this provision and if so, how that should be done.

### Annual/comprehensive inspection

An SER indicated that paragraph (f)(2)(xiv)(D) of Section 1412 should be modified to "checking pressure setting," in part to avoid having to check the pressure at "each and every line" as opposed to "at the end of the line." The Panel recommends that OSHA solicit comment on whether the provision should be changed to require that the inspection be of

pressure “at the end of the line,” as distinguished from pressure “at each and every line,” and if so, what the best terminology would be to meet this purpose.

An SER suggested that paragraph (f)(2)(xx) of Section 1412 be deleted because he believes that it is not always appropriate to retain originally-equipped steps and ladders, such as in instances where they are replaced with “attaching dollies.” The Panel recommends that OSHA solicit public comment on this issue.

#### Deficiencies revealed by an inspection

One SER commented that it could sometimes be difficult to obtain replacement parts for a crane, suggesting that when an inspection revealed a deficiency, the crane could be out of service for an extended period until parts could be obtained. The Panel notes that the crane must be taken out of service if the competent person determines that the deficiency constitutes a safety hazard. The Panel believes that the provision adequately balances the need for safety against the need for productivity and that OSHA should propose the provision as drafted.

#### Inspection documentation

A number of SERs believed that documenting monthly and annual/comprehensive inspections would not add to worker safety and would be unduly burdensome to their companies. The Panel recommends that OSHA solicit public comment on the extent of inspection documentation the rule should require.

An SER commented that the monthly inspection provision regarding documentation does not specify who must keep the documentation (unlike the similar provision in annual inspections). The Panel recommends that OSHA solicit public comment on whether the provision should specify who must keep the documentation associated with monthly inspections and, if so, who that should be.

#### Operational Aids

Section 1416 requires that certain operational aids that are not working properly be repaired no more than seven days after the deficiency (which has been determined to be a safety hazard) occurs and that others be repaired within thirty days. If parts need to be ordered, they must be ordered within seven days of the date the deficiency occurs. One SER stated that, with older equipment, it sometimes takes an extended period of time to determine the appropriate part number. Since a part cannot be ordered without that information, this can result in an extended delay in ordering the part. Two SERs stated that it was often difficult to obtain parts for older equipment and that parts often cannot be obtained within seven (or thirty) days.

The Panel notes that the proposal accommodates most of these problems in several ways. First, it requires that parts be ordered within seven days and sets time limits for repairs that

begin only after the parts are received. Second, the section makes special provision for older equipment by allowing certain alternative means of protection when older equipment is not equipped with certain operational aids. As to the assertion that there can sometimes be an extended delay in obtaining part number information, the Panel recommends that OSHA consider ways to account for this problem and solicit public comment on the extent to which this is a problem.

#### Fall Protection:

Two SERs recommended that OSHA retain the current fall protection requirements in Subpart N in lieu of those in the C-DAC document. This issue was extensively considered by the Committee; the Panel recommends that the provision be proposed as written, and that OSHA explain in the preamble how and why the Committee arrived at this provision.

#### Operator Certification/Qualification

Many SERs objected to provisions in the draft proposed requirements for Operator Certification/Qualification, though some SERs found that the C-DAC document adequately addresses a long-neglected problem for the construction industry. The Panel recommends that OSHA consider the potential advantages of and solicit public comment on allowing an operator to be certified on a particular model of crane; allowing tests to be administered by an accredited educational institution; and allowing employers to use manuals that have been re-written to accommodate the literacy level and English proficiency of operators.

One SER expressed concern that his operator, due to his difficulty in taking written tests, would not be able to pass a written exam. The C-DAC document at Section 1427(h) allows for written tests to be administered verbally as long as that employee can demonstrate the necessary level of literacy needed to use the type of written manufacturer procedures applicable to the class/type of equipment that he/she would be operating. The Panel believes that this provision accommodates the SER's concern, and that OSHA should clarify in the preamble how this concern is addressed in the proposed rule.

Some SERs indicated that the reference in 1427(b)(ii)(B) to "equipment capacity and type" is ambiguous. The Panel recommends soliciting public comment on whether "equipment capacity and type" needs clarification, suggestions on how to accomplish this, and whether the categories represented in Figures 1 through 10 contained in ANSI B30.5 (2000)(i.e., commercial truck-mounted crane – telescoping boom; commercial truck-mounted crane – non-telescoping boom; crawler crane; crawler crane – telescoping boom; locomotive crane; wheel mounted crane (multiple control station); wheel mounted crane – telescoping boom (multiple control station); wheel mounted crane (single control station); wheel mounted crane – telescoping boom (single control station)) should be used.

### Operator Training

Several SERs expressed the opinion that the C-DAC training requirements are too broad and should instead be keyed to the particular operations an operator performs and the equipment the operator uses. In particular, two SERs referred to the current OSHA forklift (powered industrial truck) operator training standards as a model for crane operator training requirements.

The Panel notes that the operator training specified in Section 1427(j)(1)(i) of the C-DAC document is geared to the "specific type of equipment the individual will operate." Thus, the training required under the C-DAC document as written would require more limited training for operators of smaller capacity equipment used in less complex operations, as compared with operators of higher capacity, more complex equipment used in more complex situations. The Panel recommends that OSHA ask for public comment on whether this needs to be stated more clearly.

The Panel recommends that OSHA consider and ask for public comment on whether a more limited training program would be appropriate for operations based on the capacity and type of equipment and nature of operations.

The Panel recommends that OSHA consider and ask for public comment as to whether the supervisor responsible for oversight for an operator in the pre-qualification period (1427(f)) should have additional training beyond that required in the C-DAC document at 1427(f)(iii)(B).

### Floating Cranes & Land Cranes on Barges

Section 1437(n)(2) requires that land cranes and derricks used on barges and other flotation devices have their rated capacity modified only by either the equipment manufacturer or a qualified person with the necessary expertise. One SER commented that no experts were available to perform the necessary calculations for the duty cycle work performed by its cranes. However, the negotiated rulemaking committee did find that these types of cranes can be involved in serious accidents. The Panel recommends OSHA solicit comment on whether there are qualified persons in the field with the necessary expertise to assess rated capacity modification as required by Section 1437(n)(2). The Panel also recommends that OSHA solicit comment on whether it is necessary, from a safety standpoint, to apply this provision to cranes used only for duty cycle work, and if so, why that is the case, and how "duty cycle work" should be defined.

### Side Boom Cranes

One SER recommended that small side boom cranes incapable of lifting above the height of a truck bed and with a capacity of not more than 6,000 pounds not be covered by the proposed rule. The Panel recommends that OSHA consider and ask for comment on whether it would be appropriate to exempt such cranes from the rule.

### Clarity

Several SERs believed that the C-DAC document was so long and complex that small businesses would have difficulty understanding it and complying with it. The Panel recommends that OSHA solicit public comment on how the proposed rule could be simplified (without creating ambiguities) and made easier to understand.

One SER suggested that the inspection provisions in Section 1412 should be incorporated into a spreadsheet detailing what needs to be inspected and when each inspection must occur. The Panel recommends that OSHA consider outlining the inspection requirements in spreadsheet form in an Appendix or developing some other means to help employers understand what inspections are needed and when they must be done.

Some SERs requested clarification as to when documentation was required, believing that the document implicitly requires documentation when it states that the employer must "determine" or "demonstrate" certain things. OSHA notes that it cannot cite an employer for failing to have documentation not explicitly called for in a standard. The Panel recommends that OSHA consider whether use of the words "determine" and "demonstrate" would mandate that the employer keep records of such determinations and if records would be required to make such demonstrations.

The Panel recommends soliciting public comment on whether the word "days" as it is used in Sections 1416(d) and 1416(e) should be clarified to mean calendar days or business days.

### **Overlapping and Duplicative Regulations**

SERs raised two issues with respect to overlapping and duplicative standards. The first, already discussed under the issue of the scope of the standard, is the question of exactly what types of equipment are considered cranes and cranes used in construction. The Panel recommends that OSHA carefully discuss what is included and excluded from the scope of this standard.

SERs also noted that California and other states had recently implemented operator certification requirements similar to those of the proposed draft standard. The Panel recommends that OSHA gather data and analyze the effects of already existing certification requirements.

### **Regulatory Alternatives**

#### Scope

Some SERs who are in the business of supplying construction materials and who deliver those materials to construction sites believe that the proposed standard should not apply to their work. While there are many circumstances in which such businesses are not in the

scope of the standard, there may be circumstances where they would be within the scope of the standard. The Panel recommends that OSHA consider excluding and soliciting comment on whether equipment used solely to deliver materials to a construction site by placing/stacking the materials on the ground should be explicitly excluded from the proposed standard's scope.

### Certification

Some SERs favored the operator certification/qualification section and some SERs were opposed to various aspects of it. The Panel anticipates that there will be considerable public comment on the proposed rule regarding this issue. The Panel recommends that OSHA should consider the information and range of opinions that were presented by the SERs on this issue when analyzing those comments. As noted above, the Panel recommends that OSHA include, as part of its preliminary economic analysis, an analysis of the costs, economic impacts, and benefits of operator certification.

In Section 1427 (Operator qualification and certification) of the C-DAC consensus document, under Option (1) (Certification by an accredited crane/derrick operator testing organization), certification would be by a testing organization that administers written and practical tests that, among other criteria, "provide different levels of certification based on equipment capacity and type."

Several SERs described situations in which an operator is very knowledgeable and skillful with respect to one particular model of crane, but has very limited knowledge and ability regarding other models and types of cranes. These SERs were concerned that such operators would be unable to obtain a certification based on equipment capacity and type. They believe that, since these operators are well qualified to operate a particular crane model, there should be a mechanism for them to become certified for that equipment. The Panel recommends that OSHA consider and solicit public comment on expanding these levels of certification so as to allow an operator to be certified on a specific brand's model of crane.

Some SERs also described crane operators whose abilities were limited to operating particular equipment in a very limited set of circumstances. They believe that these operators are fully capable of doing that work, but would be unable to pass certification tests that required knowledge and abilities beyond those circumstances.

The Panel recommends that OSHA consider and solicit public comment on expanding these levels to allow an operator to be certified for a specific, limited type of circumstance. Such a circumstance would be defined by a set of parameters that, taken together, would describe an operation characterized by simplicity and relatively low risk. The Agency should consider and solicit comment on whether such parameters could be identified in a way that would result in a clear, easily understood provision that could be effectively enforced.

Another concern raised by SERs was that it would be burdensome for small employers in remote areas to send their operators long distances to have them tested, and may be difficult

or costly to arrange to have an accredited testing organization come to their area to administer the tests. The Panel recommends that OSHA consider and solicit public comment on allowing the written and practical tests described in Option (1) to be administered by an accredited educational institution.

Under Section 1427(j)(1)(ii), the operator would have to be able to read and locate relevant information in the equipment manual and other related materials. Some SERs were concerned that the literacy level of some operators is below that needed to be able to read equipment manuals. The Panel recommends that OSHA solicit public comment on making it clear that: (1) an employer is permitted to equip its cranes with manuals re-written in a way that would allow an operator with a low literacy level to understand the material (such as substituting some text with pictures and illustrations), and (2) making it clear that, when the cranes are equipped with such re-written manuals and materials, the "manuals" and "materials" referred to in these literacy provisions would be the re-written manuals.

Some SERs were concerned that in order to become certified or qualified under Section 1427, employees would have to be proficient in English. These SERs were concerned that, as a result, the certification/qualification requirement would be burdensome for employers who have operators who are unable to speak English.

The Panel notes that the C-DAC document does not state that the certification/qualification process be administered in English. First, the document allows employees to take the written portion of the certification/qualification test verbally; there is no requirement that this be done in English. In such a case, the operator candidate would (under 1427(h) and (j)) have to demonstrate the ability to read and locate relevant information in the equipment manual and other related materials (see above). However, the C-DAC document does not specify that such materials would have to be in English. In short, while the candidate would have to have a sufficient level of literacy commensurate with those materials, as long as they were in the candidate's language, the terms of the provision would be met.

The Panel recommends that OSHA explain this in a Small Business Compliance Guide.

Appendix A -- Small Business Advocacy Review Panel Members and Staff Representatives  
for the Preliminary Draft OSHA Standard on Cranes and Derrick in Construction

**Robert Burt, Chairperson -- OSHA**

**Noah Connell -- OSHA**

**Audrey Rollor -- OSHA**

**Tressi Cordaro -- OSHA**

**Kathleen Martinez -- OSHA**

**Adrian Corsey -- OSHA**

**Bradford Hammock -- Office of the Solicitor, U.S. Department of Labor**

**Charles Gordon -- Office of the Solicitor, U.S. Department of Labor**

**Stephen D. Aitken-- Office of Information and Regulatory Affairs, OMB**

**Brenda Aguilar -- Office of Information and Regulatory Affairs, OMB**

**Dominic Mancini -- Office of Information and Regulatory Affairs, OMB**

**John Kraemer -- Office of Information and Regulatory Affairs, OMB**

**Thomas Sullivan -- Office of Advocacy, Small Business Administration**

**Bruce Lundegren -- Office of Advocacy, Small Business Administration**

**Charles Maresca -- Office of Advocacy, Small Business Administration**

**Radwan Saade -- Office of Advocacy, Small Business Administration**

Appendix B -- List of Small Entity Representatives

**SBREFA Cranes and Derricks Proposed Standard  
Small Entity Representatives**

<p><b>Bill Miller</b> Midwest Crane and Rigging 1804 S. 8<sup>th</sup> Street St. Joseph, MO 64503 913-764-5560 <a href="mailto:bmiller@builderec.com">bmiller@builderec.com</a></p>	<p><b>Donna Stevenson</b> Stevenson Crane Service 410 Stevenson Drive Boilingbrook, IL 60440 630-972-9199 <a href="mailto:donna@stevensoncrane.com">donna@stevensoncrane.com</a></p>
<p><b>Alan Ashlock/Gary Campbell</b> Cranes Rental Corporation 170 North Goldenrod Road Orlando, FL 31807-8204 407-277-5000 <a href="mailto:aashlock@cranerental.com">aashlock@cranerental.com</a></p>	<p><b>Greg Peters</b> Huddleston Crane Service 27545 Maple Street Taft, CA 93268 661-203-1012 <a href="mailto:greg@huddlestoncrane.com">greg@huddlestoncrane.com</a></p>
<p><b>Carl L. Harris</b> Carl Harris Co., Inc. 1245 S Santa Fe Wichita, KS 67211 316-267-8700 <a href="mailto:carl@carlharriscompany.com">carl@carlharriscompany.com</a></p>	<p><b>Howard Pebley</b> McAllen Construction P.O. Box 3244 McAllen, TX 78501 956-686-7819 <a href="mailto:howard@mconst.com">howard@mconst.com</a></p>
<p><b>Jerry Anderson</b> Anderson Construction Eufaula Office P.O. Box 27 Eufaula, AL 36072 334-687-2727 <a href="mailto:jerry@acco.cc">jerry@acco.cc</a></p>	<p><b>Rick Burgett/Dan Brodaski</b> Rebcon, Inc. 1868 W. Northwest Hwy Dallas, TX 75220 972-444-8230 <a href="mailto:danb@rebcon.com">danb@rebcon.com</a></p>
<p><b>Art Daniel</b> Daniel Construction Service, Inc. 200 Bryan Place Cedar Hill, TX 75104 972-291-3304 <a href="mailto:a2daniel@danielcs.com">a2daniel@danielcs.com</a></p>	<p><b>Thom Sicklesteel</b> Sicklesteel Cranes, Inc. 1021 Sicklesteel Lane Mt. Vernon, WA 92874 360-428-3811 <a href="mailto:Thoms@sicklesteel.com">Thoms@sicklesteel.com</a></p>

<p><b>George S. Young</b>  <b>George Young Company</b>  20<sup>th</sup> Street and Oregon Avenue  Philadelphia, PA 19145-4296  215-467-5315  <a href="mailto:gyoung@gvco.us">gyoung@gvco.us</a></p>	<p><b>Michael Scott</b>  <b>Crane Rental Co, Inc.</b>  1601 W. Street, NE  Washington, DC 20018  202-529-6100  <a href="mailto:cranerental@mindspring.com">cranerental@mindspring.com</a></p>
<p><b>Phil Henriksen</b>  <b>Garff Construction Corp.</b>  2820 West 500 South  Salt Lake City, Utah 84104  801-973-4248  <a href="mailto:phil@garffconstruction.com">phil@garffconstruction.com</a></p>	<p><b>Larry Allison , Jr.</b>  <b>Allison Crane &amp; Rigging</b>  1247 Rout 15 Hwy  Williamsport, PA 17702  570-323-8355  <a href="mailto:allisonjr@suscom.net">allisonjr@suscom.net</a></p>
<p><b>Steve Halvorsen</b>  <b>Henry Carlson Company,</b>  <b>ASCO, Kybruz-Carlson</b>  1105 West Russell Street, P.O. Box 84010  Sioux Falls, SD 57118  605-336-2420  <a href="mailto:shalvorsen@henrycarlson.com">shalvorsen@henrycarlson.com</a></p>	<p><b>Steven Spence</b>  <b>King Crane Service, Inc.</b>  155 El Pueblo Road  Scotts Valley, CA 95066  831-438-279  <a href="mailto:sspence@kingcrane.com">sspence@kingcrane.com</a></p>
<p><b>Mike Schumacher</b>  <b>Aristeo Rigging and Erectors</b>  11668 Lilburn Park Road  St. Louis, Mo 63146  314-447-3901  <a href="mailto:mikes@aristeo.com">mikes@aristeo.com</a></p>	<p><b>Tony Zelenka</b>  <b>Bertucci Contracting Corp.</b>  7 River Road  Jefferson, LA 70121  504-835-0303  <a href="mailto:TonyZ@bertuccicorp.com">TonyZ@bertuccicorp.com</a></p>
<p><b>Bernard Weir</b>  <b>Norris Bros. Co., Inc.</b>  2138 Davenport Avenue  Cleveland, OH 44114-3724  216-771-2233  <a href="mailto:sales@norrisbr.com">sales@norrisbr.com</a></p>	<p><b>Carl Milley</b>  <b>Zeisloft Trucking, LLC</b>  1699 Crown Point Road  Thorofare, NJ 08086  800-253-9540 ext 14  <a href="mailto:carlm@zeisloft.com">carlm@zeisloft.com</a></p>

**Dan Raabe**  
**Watkins Concrete Block**  
**14306 Giles Road**  
**Omaha, NE 68138**  
**402-894-6511**  
**[danr@watkinsconcreteblock.com](mailto:danr@watkinsconcreteblock.com)**

**George Buck**  
**Werden-Buck Company**  
**55 East Webster Street**  
**Joliet, IL 60432**  
**815-726-3466**  
**[geebrick@hotmail.com](mailto:geebrick@hotmail.com)**

**Walt Lewicki**  
**American Crane and Rigging**  
**7315 Fannett Road**  
**Beaumont, TX 77705**  
**409-284-6272**  
**[waltjr@americancraneusa.com](mailto:waltjr@americancraneusa.com)**

Appendix C -- Written Comments Submitted by Small Entity Representatives

Comments Received

Bill Miller  
Midwest Cranes and Rigging

Greg Peters  
Huddleston Crane Service

Carl L. Harris  
Carl Harris Co., Inc.

Jerry Anderson  
Anderson Construction

Art Daniel  
Daniel Construction Service, Inc.

Howard Pebley  
McAllen Construction

Rick Burgett  
Rebcon, Inc.

George S. Young  
George Young Co.

Tony Zelenka  
Bertucci Contracting Corp.

Bernard Weir  
Norris Bros. Co., Inc.

Steve Halvorsen  
Henry Carlson Company

Walt Lewicki  
American Crane and Rigging

Thom Sicklesteel  
Sicklesteel Cranes, Inc.

**Bill Miller**  
**Midwest Cranes and Rigging**

## Martinez, Kathleen - OSHA

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**From:** Bill Miller [bmiller@builderec.com]  
**Sent:** Friday, August 25, 2006 10:05 AM  
**To:** Martinez, Kathleen - OSHA  
**Subject:** Fw: Crane & Derrick Standard

Kathy:

I sent this to Bruce this morning.

----- Original Message -----

**From:** Bill Miller  
**To:** Bruce E Lundegren  
**Sent:** Friday, August 25, 2006 8:58 AM  
**Subject:** Fw: Crane & Derrick Standard

Bruce:

Call me when you get a chance.

Thanks,  
Bill Miller  
Midwest Crane & Rigging

**Subject:** Fw: Crane & Derrick Standard

**From:** Bill Miller  
**To:** David Miller ; Brad Miller  
**Sent:** Thursday, August 17, 2006 4:23 PM  
**Subject:** Crane & Derrick Standard

Issues for consideration

1) Yes. Eliminate general statements such as "The crane must be properly grounded" What is " properly grounded" .

2) Yes. Some collective bargaining agreements restrict portability of employees. In the case of out of home area work, either require portability or require referrals to be qualified by the referring agency.

Under Section 1417(o) (3) (ii), How is the operator going to verify the weight of the load? How often should the load weighing device be verified for accuracy? In the case of a rental company, this would create an adverse relationship with the customer that should be able to rely on the condition of the equipment provided by the rental company.

Under Section 1425 (c) (3), is the rental company required to verify the qualifications of the rigger? We are very concerned over the possibility of creating a problem with the customer.

3) Yes. The certification of all operators of equipment with lifting capacity of 2,000 Lbs. or more will be a major task for those that have several machines of various sizes and types.

Having to test and certify for multiple machines and ensuring that each machine dispatched has the right operator will be an administrative nightmare. This will also result in increased labor costs because those operators that have multiple certifications will demand higher wages.

This will also result in down time for men and machines if the operator available is not certified for the machine required or if the operator is not available for the machine in service.

B. Ground Conditions

1) Usually the general contractor provides for equipment access. It is increasingly becoming a bigger problem

10/13/2006

with construction managers to shift the responsibility by contract to each subcontractor to provide for their own access roads. Crane set up and work locations are also becoming the responsibility of each sub through contract requirements. This is the same shifting of responsibility that is done for OSHA fines and insurance claims by requiring subcontractors to pay for OSHA citations issued to the controlling entity for unsafe conditions as well as the contractual requirement to list the owner, contractor or const. manager and the architect as additional insureds on the subcontractors general liability policy.

There is no incentive to maintain a safe work site if someone else is paying for all of the citations or losses. We find it to be increasingly difficult to get proper site conditions due to the cost, the lack of equipment, and the lack of understanding by subcontractors that are not in the dirt business.

2) We do a large number of rentals to modular home contractors. These sites are usually long distances from the crane yard. The sites range from 50 to 150 miles away. Each site inspection takes from 3 to 6 or more hours to check and sometimes two trips are required.

On metro projects that we are also the installation contractor, site inspection takes about two hours. We send a rental supervisor to check most sites.

#### C. Assembly/Disassembly

1) We have a set up supervisor for the lattice boom cranes. The hydraulics are set up by the operator and oiler ( if an oiler is required ).

2) We have learned that manufacturers do not have a set up procedure. Since site conditions vary, we determine our own set up procedure depending on those site conditions.

#### D. Power Line Safety

1) We have no way of knowing how many jobs require working less than 20 feet from any power line on rental work.

On the sites where we are the installation contractor, less that 10%.

Very few jobs require working within 10 ft. If a job that is within 10 ft. is longer than 1 day, we insist on turning off the power or booting the lines.

2) We currently follow the ANSI (B 30.5)

3) If in a rare case we must work inside 10 ft., we require killing the power and grounding the lines or booting the line and have a power company supervisor on site to monitor the work.

4) We instruct our employees in power line safety requirements and if on sites where we are the installation contractor, we require our foremen to have a spotter if we are close to live power.

5) These estimates apparently assume that every one involved is at where the meetings take place and that all of the equipment, safety equipment is already at the site and that no time is required to cause the former to happen. Also, none of the 30 plus machines that we have has a proximity device and no one in our area, to my knowledge, has a machine with one.

I would double or triple the estimate the times estimated.

#### E. Inspections

1) We do daily, monthly, and annual inspections as well as inspection of each machine if it is re-configured.

We also inspect and test after each repair involving functions or operator aids.

2) We exceed the currant ANSI standard.

3) (iii) We do not inspect pressure lines daily. This is far too involved to do on a daily basis. Many lines are not located in plain sight and would require removal of guards and covers and would be very time consuming. Some lines in outrigger systems can not be inspected with out dis-assembly.

(vi) Unless the crane is re-configured, we do not inspect reeving.

(f) Annual Inspection

(x) through (xvii) We do not currently inspect these areas that require dis-assembly unless there is evidence of leaks or loss of functions.

4) We do our own inspections by a master mechanic.

The new standard would have no effect on this process.

5) Yes

6) Yes. Nothing would need to change to comply.

7) We think that the daily inspection as written would be a significant cost impact due to the time required to include inspection of pressure lines and reeving. This cost should include the lost time for the customer unless the inspection is done prior to the shift which would require overtime pay.

The time allowed for annual inspection is greatly underestimated for the inspection as written if dis-assembly is required to inspect pressure lines and electrical that is not normally visible. This could add several hours for two men to accomplish.

#### F. Fall Protection

- 1) We utilize the manufacturers guard rails and utilize anti-slip paint or stickers. We require the use of fall protection when climbing up the boom or when assembling above 15 feet.
- 2) Most of our machines do not have guard rails on the roof of the upper structure. We do use slip resistant surfaces in the locations where workers are likely to walk. Most are factory installed on the newer machines but owner installed on the older models.
- 3) No.

#### G. Operator Certification/qualification:

- 1) Since we have been in business for many years, we have trained most of our operators and others we have known from other companies. Several have been CCO certified.
- 2) We employ approx. 25 operators.
- 3) This cost is assuming that a group would train and test at the same time. The cost would be much higher if only one at a time was trained and tested.

#### H. Signal Person Qualification

- 1) It is normal in the rental business to find that a customer does not know how to signal a crane. Most signal persons understand the load dynamics in swinging and stopping loads. Many do not. When we self perform, we have few problems with signaling.
- 2) We do train some rental customers but do not do any testing or qualifying. When we self perform, our workers are union ironworkers and are trained through the apprentice program.

#### Costs and Economics

- 1) We do between 1500 and 2000 crane jobs each year. Most rentals are in hours not days. The self perform projects usually run from 1 week to 3 months.
- 2) We have 32 cranes. We are a rental company as well as a steel and precast concrete erector.
- 3) We rent from others as needed. We rent both with and without operators. We rent approx. 30 times per year.
- 4) We employ about 25 operators and 8 to 10 oilers/apprentices. We change perhaps 5 to 6 per year. Most have been steady for 5 to 28 years.
- 5) Our labor cost are double and in some cases triple the rates shown. An ironworker cost us over \$52.00 per hour and operators are the same within a few cents either way. It would seem that the times allowed are assuming large numbers are trained or instructed at the same time and therefore savings due to volume. This is not the case for typical projects dealing with power line safety or training and testing of operators.

#### J. Alternatives

- 1) We have no comment.
- 2) We think that the volume of paperwork required will not be done by your typical small business person simply for lack of the time required to do it. When a business person is running the machine, doing the maintenance/repairs, and running the business, this type of paperwork is not going to get done.

#### K. Documentation

- 1) We already do documented inspection and maintenance records.  
We do not think that added paper work increase safety.  
The record keeping requirements are clear.  
We think that the documents retention requirements in this standard will be used to create the justification for large and multiple fines. More paperwork does not make work safer.

**From:** Lundegren, Bruce E. [Bruce.Lundegren@sba.gov]  
**Sent:** Monday, September 18, 2006 3:12 PM  
**To:** Burt, Robert - OSHA; Martinez, Kathleen - OSHA  
**Subject:** FW: SBREFA Crane & Derrick Proposed Standard  
Copies of Comments from Cranes and Derricks SER.

-----Original Message-----

**From:** Bill Miller [mailto:bmiller@builderec.com]  
**Sent:** Thursday, September 07, 2006 5:02 PM  
**To:** Bruce E Lundegren  
**Subject:** SBREFA Crane & Derrick Proposed Standard

Bruce: These are additional questions and comments on the Proposed Standard.

1406

Under a rental contract the lessee is the statutory employer of the crane operator in that the operator is under the direction and control of the lessee. Is the lessee considered the employer under the standard?

1408 and 1410

How is the required grounding to be determined and by whom? How will a compliance officer know what is proper grounding?

1412

It does not make sense to inspect pressure lines or electrical connections at the start of each shift unless there are obvious leaks or lack of function. It also is not practical to require inspection of reeving unless it has been changed. If a change in reeving has been made, the operator has already performed the inspection prior to use. What is the allowed reduction in hydraulic pump pressure from new to be considered to be in need of repair?

1425

On rental work, who is responsible to determine if the customer has a qualified rigger?

1427

What is "different levels of certification"? This needs to be specific. Any certification program provided under option 3 would be very costly and most likely be cost prohibitive for a small business. The multi level certification will, in it self, will likely result in upward pressure on wages and testing costs that will cause some small crane companies to cease operations. If a company has a large number of operators to train and test, the economy of scale might make economic sense. There is little doubt that the big crane companies will enjoy a distinct advantage. As mentioned in the conference calls, the language barrier is going to affect the opportunities available to minorities to become employed as crane operators. Few employers will want the liability for certifying the ability of those to be able to read and understand the operators manuals. Small companies do not have staff for those duties.

1428

Who determines the qualifications of the signal person on rental jobs?

In general, we believe that the cost to small business is grossly understated. Our hydraulic truck cranes have averaged nearly 5 jobs per week with some doing 2 or 3 jobs per day. The crawlers usually do 8 to 12 jobs per year. The cost estimate was based upon 4 jobs per year. The increased inspection cost along with the documentation required will also greatly increase costs although we do not yet know how much. The sign off requirement by the mechanics will also affect the cost of repairs done by third parties due to the increased cost of insurance requirements that will be increased by equipment owners to cover the liability for repairs.

**Greg Peters**  
**Huddleston Cranes Service**

Written Comments

September 8, 2006

Greg Peters  
Huddleston Crane Service Inc.  
Taft, CA 93268

Re: Proposed Consensus Standard Cost Analysis Review  
SUBREFA Panel

Everything looks like the proposed standard will not be difficult for our Small business to comply with. Many of the issues specific to us are already being performed. Some of the issues do not really apply to us, as we only have hydraulic cranes.

The one issue I certainly would like to comment on is the Training and Certification issue.

As a representative from a Small Business Crane and Trucking company located in Taft, CA. We have an average of 12 – 15 full-time employees and about 2 – 4 part-time employees. We currently have 11 cranes ranging from 12 ton to 120 ton all hydraulic truck mount cranes. I feel we are probably about the smallest of small business represented on this panel.

Because CA introduced legislation, enforceable back on June, 2005, we have gone through the growing pains and training and certification issue, first hand.

Prior to the certification requirement we had an in-house training program for our operators. Once we recognized the knowledge necessary to successfully complete the certification process, we decided to bring in a trainer from Florida to provide our employees preparatory training to assist in our certification process.

We utilized a 2-day training option. Because our operators were pretty familiar with the industry and as mentioned we already had a training program in place, we experienced a very high 1<sup>st</sup> time pass rate. Of the 7 candidates initially put through the training and then the written exams we only had 1 individual fail 1 of the 3 written exams. Each of the other employees took and passed all 3 written exams.

After the initial group of employees went through the certification program we knew more of the content in which we needed to tailor our in-house training toward.

Currently we train our own operators and coordinate the written exams as well as administer the practical exams. This option is available to any who wish to do the same.

The really interesting thing to me was the attitude of the operators prior to attending additional training and then the attitude shift after completing the training and certification experience. We had some operators who have operated cranes for over 30 years. Those operators were not happy about or looking forward to attending the training. After the training, those same operators made statements such as WOW, I have done that for all these years, now I know I was doing it the right way and why it is the right way. Or, WOW I have been doing that for all these years and never realized that was not the way I was supposed to do that.

If for no other reason I think the confidence level of the operators has skyrocketed. I can not even put a number to that.

If I were to answer the question, has the certification requirement increased the safety of our employees, the only response I can say is, Yes.

I have heard the comment, "It is not the certification that made the operators safer but the Training".

I could not agree more!!

We are living proof. The training requirement has always been there. I thought we were doing pretty good at training our guys. However, once the certification requirement came around, it made us take a really hard look at our training and certainly make improvements to make our training better. Ultimately, making our operators more educated and a safer operator.

How do you put a price on potentially saving a life on a job site?

In addition to the knowledge and safety awareness of the operators, our influence and status among our completion went up. Shortly after the completion of our first group of operators to become certified our clients looked at our experience and certification as meeting an industry standard showing a level of competence other than self acclaimed.

This certainly helped put us at a competitive edge.

We primarily work in the oilfields around the Kern county area in CA. Because the oilfield company's risk managers, safety managers and the likes, recognized the certification requirement as a level of competence they started to enforce the requirement and accepted the fact along with the requirement and enforcement would come rate increases.

Although we do not sit around the camp fire and sing Kum-By-Ya, we have experienced favorable feedback from rate increases from the clients, as they recognize, a properly trained and certified operator reduces the risk of an accident, injury or death on their job sites.

For an investment in our operators of approximately \$2000 per student over the course of a 5 year certification, costing us less than \$8 per week, you can not match the level of safety awareness or confidence with any other program out there.

Since our training investment we have experienced approximately a 7½% rate increase.

Getting back to my previously mentioned comment of the certification not making the operator safer but the training. If the certification requirement would not have occurred, I really wonder how long it would have taken us to take the same level of assessment of our own training program to bring it up to the level it is now. Perhaps a serious accident or a fatality?

Thankfully that is not what it took.

Therefore, I fully support the training requirement and certification requirement.

Will these requirements make our crane industry and Small Business Operators safer and result in a safer workplace?

Yes!

Thank you for allowing me to submit my comments.

Greg Peters  
Training Director  
Huddleston Crane Service Inc.  
PO Box 206  
Taft, CA 93268  
Phone: 661-765-7059  
Fax: 661-765-4058  
Email: [Greg@huddlestoncrane.com](mailto:Greg@huddlestoncrane.com)

Comments and response to new crane standards:

August 14, 2006

1. Panel issues:

- General item #2: (see specific items listed below)

2. Ground Conditions:

- The ground condition issue is not one simply resolved by making the controlling contractor responsible. The conditions may vary due to the following conditions: crane supplier & operator, owner/engineer supplied existing condition information, other structural aspects near the site, occupied space near crane set-up area, underground utilities, crane size, load size (physical and weight), and load setting distance. The controlling contractor may not be able to control all these scenario's. All parties involved in the crane operations need to be involved in the process.
- Regarding adequate site assessment: it is not only whether or not the supervisor's time can be limited to just 30 minutes, but the whole team has to be assessed in the operations and this could include the Superintendent, Project Manager, Director of Safety, Owner, Architect, Engineers, Crane /operator (irregardless of who supplies him), utility companies, etc. This isn't a simple cost even on smaller projects. It may involve multiple cranes due to restraints or load restraints.

3. Power Line Safety:

- No issues with this item.

4. Power Line Safety:

- Approximately 5% of our projects can involve working within 10' of power lines or closer. These involve approximately 5-10 days working in this condition (although lines have been sheathed by power company in the instances or in other condition, we refuse to make the lifts. (half the time).
- Regarding estimates costs of various power line safety measures appear to include only actual on-site time for the issues but do not include the other aspects of travel ( to and from ) for various entities involved ( i.e. Engineer, and the mobilization of the various barricades, lines, etc. To be used.

5. Inspections:

- I believe the required inspections would make our operations more safe and have difficulty not accepting them. I am curious why the monthly inspections would be only required to be maintained for three months. How long are the daily's required to be kept (three days?)? The yearly for 3 years?
- I don't believe that the monthly inspections and the annuals would add only an additional 15 minutes.

6. Fall Protection:

- I am concerned with the degree that OSHA would use this requirement and it would be misused in inspections.

7. Operator Certification/Qualifications:

- We include a third party certification firm for all of our certified operators. The costs for a two day certifications is approximately \$850.00 per operator. (slightly higher than OSHA's estimate.
- Although certified, we still monitor the on the job training, experience, and overall crane operations to insure that certified operators are also qualified and authorized by our company. All three aspects are critical.

8. Signal Person Qualifications:

- I believe that this is critical to incorporate for the safety of the operations.

9. Drug Testing: Although Drug testing was ignored, according to Mr. Burd's cover letter to our packet, "protecting the safety and health of employees" rings in my ears. My experience with drug abuse in construction is showing an increase. This increase, is all the more important to enforce the drug testing requirement for certified operators. To eliminate this aspect of the certification process is to negate the

balance of any reason to even modify the existing crane standards. I deeply believe in this particular issues and seriously question any attempt to leave it out (irregardless of the reason).

**Carl L. Harris**  
**Carl Harris Co., Inc.**

## VIA FAX AND E-MAIL

September 8, 2006

Robert Burt  
Chair, Small Business Advocacy Review Panel  
Safety Standards for Cranes and Derricks, OSHA Docket S030A  
U.S. Department of Labor  
Occupational Safety and Health Administration  
Washington, D.C. 20210

Dear Mr. Burt,

I would like to thank The Occupational Health and Safety Administration (OSHA) and the Small Business Administration (SBA) for the opportunity to serve as a Small Entity Representative (SER) in the review of the proposed Safety Standard for Cranes and Derricks in Construction under the processes mandated by the Small Business Regulatory Enforcement Flexibility Act (SBREFA). For the remainder of these comments, I will refer to the SBREFA panel or the SBREFA process as limited to the proposed Standard and its alternatives.

My name is Carl L. Harris, and I run Carl Harris Co., Inc., based in Wichita, Kansas. Founded in 1985, my company is a Class B General Contractor involved in residential and light commercial construction. We use cranes almost every day, and we rent/lease on an "operated and maintained" daily or hourly basis for our residential and light commercial work. A great deal of our crane usage used to be in the commercial field but in the last ten years we have seen a huge increase in the use of cranes in residential construction. We use cranes to set large trusses, steel framing for greater clear heights and greater open spaces, and precast concrete pieces including precast concrete floors over basements and safe rooms. We lease various types of cranes (hydraulic, conventional, truck, track, etc.) of differing sizes (18 ton to 350 ton) on a almost daily basis, accounting for nearly 2,500 crane hours last year.

## **A. The Proposed Rule Does Not Take Account of Residential Construction.**

### *1. Residential construction is an industry of many small businesses.*

The large, overarching comment I have to make is that this proposal and its preliminary analysis (PIRFA) seem to ignore the existence of businesses like mine altogether. This rule takes no notice of the characteristics, practices, and requirements of residential construction, especially single-family construction. Most residential builders are small businesses like mine; 99 percent of the builders in the National Association of Home Builders (NAHB) are small. We small builders construct about 60 percent of the new housing units every year.

### *2. Most small builders rent their cranes from rental firms, with operators.*

Small builders do not own cranes; we're too small to make effective use of such a large capital asset. We rent them from crane rental companies, who usually supply the crane operator. The rental period is very short—typically one day, sometimes two days, possibly as much as two weeks. The proposed standard obviously envisions a different kind of crane usage, as shown by its use of the term “lease.” A lease is usually a long term concept, like leasing a car for two years instead of renting a car for the weekend. Obviously, the proposal is relevant only for those situations where the crane will be on the jobsite for an extended period, perhaps even the duration of the erection of the skeleton and façade, as with a tower or hammerhead crane. It is very hard to see how these rules could be applied sensibly to a four-hour rental of a 20-ton crane to set roof trusses of a few hundred pounds.

### *3. Small Builders have to rely on the expertise of the crane owner and operator.*

One of the major mistakes revealed by that focus is the intensively detailed attention paid to training of operators. Most small builders don't hire operators; the operators come with the crane. Therefore, we don't train them. We do not have the expertise to train operators; we expect the crane rental company to have that expertise and to supply expert operators.

The same large-operation mindset also applies to issues like equipment inspections and evaluation of ground conditions or other safety issues related to crane operation. Builders can't perform meaningful inspections; we don't know what to look for. Builders are not crane experts, and we don't know precisely how the crane works. Builders rely on the crane owner to inspect the crane before it comes out to our jobsite. The cranes are unlikely to stay on the jobsite overnight, even if the crane is rented for more than one day at a time. Since the crane returns to the rental company every night, the builder relies on the crane owner to perform any necessary inspections and supply equipment that is safe and ready to use, except for any assembly the operator may need to do at the jobsite.

Once the crane is at the jobsite, the general contractor cannot simply provide the crane operator with a list or map of unsafe conditions or hazards to crane operation. The

contractor is not an expert on cranes; the operator is the person with expertise. The builder relies on the crane operator to ask about or specify the conditions the crane needs for safe operation, and the builder needs to provide that information. The operator needs to ask if the ground is soft, or there are collapsible underground lines, or there is enough space for outriggers, or whatever else that crane needs for safe operation. The needs differ with the cranes, and the crane owner is expected to have that information, relayed through the operator. The requirement for knowledge is best placed on the person with best access to it, and that is the owner or the owner's employee, the operator. If the operator is not satisfied that it will be safe to operate the crane, then he or she should refuse to lift. The builder needs the lift, and will accommodate the operator if there is any practical way of doing so. It could be a while before another crane can be had.

#### **B. The coverage of the Proposed Standard is unclear.**

Though many machines obviously qualify as cranes under the standard, such as tower cranes and lattice boom cranes, construction sites are now populated with multi-purpose or hybrid machines that can do many tasks. The functional definition in section 1400(a) applies the proposed standard to "power-operated equipment that can hoist, lower, and horizontally move a suspended load." A forklift can do those things if a boom hoist is attached. Does attaching a boom hoist turn a forklift into a crane? The proposal excludes hoisting equipment that has been modified to a non-hoisting use, but it says nothing about conversions in the other direction, from non-hoisting to hoisting.

The standard provides illusory comfort in 1400(b)(8) which excludes "Powered industrial trucks (forklifts)." However, the forklift standard for construction, 1926.602(c), states that it applies to "Lifting and Hauling Equipment (other equipment covered under subpart N of this part)," which is the crane standard. The general industry standard for powered industrial trucks applies to specialized industrial truck, powered by electricity or internal combustion, except for farm vehicles, earthmoving equipment, and vehicles for over-the-road hauling. The general industry standard is silent on hoisting as an inclusionary or exclusionary factor. Therefore, the regulatory language is circular. The proposal says it does not apply to forklifts, and forklifts are lifting equipment that is not covered by the crane standard.

To make this issue somewhat more concrete, attached are two brochures from Terex Corporation, a maker of construction equipment. I particularly ask you to look at the front cover of the brochure for the Model 3007, which clearly shows a boom and winch attached to the machine, and a suspended load is being moved horizontally onto the building under construction. Other photos show the machine in use as a classic forklift. The other machine is similar, except it has a higher capacity, a longer reach, and a rotating cab. What operator do I need for these machines? Do I need to keep two operators on hand, depending on what attachments are on the machine?

#### **C. Different kinds of training are needed for different kinds of cranes.**

*1. Cranes vary widely in size, capacity, usage, and risk.*

The very narrow perspective of the Crane and Derrick Advisory Committee (C-DAC) committee may be why it has one approach for all cranes in all situations, regardless of size, load, use, ownership, or risk characteristics. It seems obvious that cranes that are very different and are used in very different ways must present different risks. It would have been very helpful if OSHA had supplied information about the type, size, use, and/or load of the cranes involved in the injury research it did for this standard. As it is, it seems obvious that tower cranes present different risk profiles than, say, boom trucks. For example, a tower crane extends beyond the footprint of the building by necessity; in urban settings, that would mean the crane extends beyond the property line, often hanging over streets and sidewalks. It lifts loads to a great height, and a dropped load could travel a considerable horizontal distance, possibly injuring people off-site. However, as one of the SERs remarked, some of the boom truck cranes can't lift a load any higher than four inches above the truck bed. A boom truck only strays over the property line by accident; it has no cause to do in normal operation, and it doesn't overhang the footprint of the structure at all, unless it is depositing something on the structure, like a truss.

Large, lattice-boom cranes may lift loads of 350 tons to heights of ten stories or more. They are often mounted on wheeled trucks or crawlers, and their wheelbase is not that much greater than a boom truck. Yet they lift much greater loads to much greater heights; surely the problem of controlling the center of gravity, and thus the risk of toppling, must be much greater for that large crane. The longer cables will be subject to greater horizontal sway, giving them more chance of hitting power lines. It's understandable that they could need close regulation, if there is a history of problems. However, the risks presented by tall lattice-boom cranes have to be very different from those presented by small cranes designed to lift and move small loads for single-family residential and light commercial construction. The only apparent differentiation of crane classes turns out to have no meaning; though the certification requirements do not apply to equipment with less than a 2,000 lb. capacity, an internet search revealed no such cranes. The smallest crane capacity was 6,000 lbs; the only hoisting or lifting machinery with lower rated capacities were powered industrial trucks that are excluded from the rule, anyway.

*2. Training should be appropriate for the kind of crane the operator will be using.*

No one should operate equipment they don't know how to use, and the operator's employer should make sure the operator has the knowledge to run the relevant crane for the use to which it will be put. But with all those differences in cranes, there will be important differences in operation. Trucking has some similar issues; the fact that someone can drive a pickup truck does not mean he or she can drive a tractor-trailer. Drivers need different training for those jobs, even though each job is driving a truck. Computers can do myriad different things, and no one person can know all the applications any more. People have to be trained for the particular use of the equipment in a particular job at a particular business. Therefore, OSHA must make meaningful distinctions between classes of cranes, they should also design training appropriate to the kind of crane and its use. Then a business, trade association, or professional society can adapt those training programs to the needs of workers, members, clients, or the public.

There is no point in having the employer train an operator for equipment the employee will not use; that merely provides the employee with an incentive to look for another job that requires the extra training he or she now has, assuming the other job is higher-paying.

**D. OSHA has ignored an entire large industry of small businesses.**

*1. OSHA's omission of small business home builders is explicit.*

The biggest flaw in the PIRFA is so large that it kills any value the PIRFA may have as an evaluation of the small business impacts of the rule. That flaw is the omission of residential construction from the entities covered under SBREFA, as shown in PIRFA Tables 3, 4, 5, and 6. Multifamily construction is omitted altogether. In single-family housing construction, the PIRFA claims that only 168 establishments use cranes; all of those establishments own cranes and rent them to others with operators. According to the PIRFA, no small single family builders own cranes, and no small single family builders lease cranes from others. That statement by the PIRFA is false. I am a small business owner whose business includes single family residential construction, I do lease cranes from others, and I am not alone.

*2. The housing industry uses a lot of cranes.*

In 2005, private builders completed 1.7 million single-family homes, and the very great majority involved the use of a crane at least once, most commonly to set roof trusses. Additionally, 266,000 multifamily units went up, just in buildings of ten units or more. At the most conservative estimate, there are at least 1 million crane jobs in residential construction, and it could easily be 2 million or more. This one omitted industry accounts for almost three times as many crane jobs than OSHA had estimated for the nationwide total, and perhaps even more. The omitted firms were mostly small businesses; the overwhelming majority of single-family builders are small businesses. OSHA made no estimate of the impact of the proposed standard on the most visible part the construction industry—housing. If these data are missing from the analysis, if OSHA has been this myopic, it calls into question the accuracy of all OSHA's other numbers, none of which have been supported by data as of the time these comments are filed.

*3. The costs of the rule are grossly misstated.*

The costs of the rule were appallingly underestimated. Suppose, very conservatively, that there are 1 million residential construction jobs that use a crane each year, and each job lasts eight hours, or one day. Of the SERs commented in the first day's conference call on August 29, 2006, that the training and certification program in California had resulted in an hourly crane rental price hike of \$12 to \$15. Adjusting that downward to a \$10 per hour increase, that means the requirement will add \$80 to every day of crane rental. If the 1 million crane jobs average 1 day in length, then the proposed standard would add \$80 million a year in costs for residential construction.

But the average length can't be one day, because that's usually the shortest time they can be rented, including transit. Sometimes I need the crane for two days or three, sometimes two weeks. If the average is four days per job, the total costs—just to residential construction—would be \$320 million, just right between the high and low benefits estimates for the rule. If you add the \$89 million estimated costs outside of residential construction, the costs of the rule come to \$409 million, which exceeds the benefits.

Though cranes may not be the most dangerous aspect of a construction site, it is true that some people are hurt or killed in ways that involve cranes, and there is no doubt that reducing those deaths and injuries would be a good thing. However, the method proposed by OSHA in this standard would have very large impacts on residential and light commercial construction, industries that are dominated by small to very small firms. This extensive training and certification program with a one-size-fits-all approach does not even look like it would work on single family construction sites. OSHA appears to have tried to apply the conditions of heavy construction to all construction, even though there are few similarities in the kind of work being done or the kinds of firms and labor that do that work. Page 14 of the PIRFA makes explicit that much of OSHA's data are based on heavy industry.

**E. The certification requirement in the proposed standard is anticompetitive, and it will tend to push small businesses out of the residential construction industry.**

*1. Training is a good thing.*

There seems to be no dispute that it is important that workers be trained to work with or around machinery safely. Indeed, of the problem with this rule is that the training it mandates is not appropriate for the single-family or light commercial construction site, so it will not make them safer. If OSHA developed a training program that was appropriate for the kinds of machinery and the kinds of working conditions and jobsite conditions that prevail in single family and light commercial construction, that could enhance safety at such jobsites. However, OSHA has proposed a training program designed for the construction of dams, highway interchanges, skyscrapers, and other enormous projects. As I have tried to explain, the difference between these large projects and single-family residential construction is not just a matter of degree; single-family residential and light commercial construction is different in kind from heavy or large commercial construction. Rules to govern the practices of one industry are not going to be helpful in

the other, because the practices are so different. Since this rule ignores residential construction altogether, it does not describe an appropriate training program.

*2. Certificates are not helpful; they are merely barriers to entry.*

It's a truism to say that a piece of paper has never saved anyone's life. That chestnut is actually a valid criticism of the proposed standard, because it does not focus on safety or skills; it focuses on getting a piece of paper. Furthermore, it focuses on making it very expensive to get that piece of paper. For example, the proposed standard would require every operator candidate to take a written exam, which requires literacy, probably in English. While there are legitimate debates about the use of English in business and about the requisite literacy of the workforce, they are not related to crane safety. All over the world, people operate cranes in languages other than English, and many of those operators may well be illiterate in all languages, not just English. It's knowledge of crane operation and safety that matter, not knowledge of how to take a test. This test requirement will have the effect of screening a large part of the construction workforce out of crane operator jobs that they can perform perfectly well. This arbitrary constriction in labor supply will raise the cost of labor, as well as increasing the frequency and length of delays, waiting for a certified operator to be found.

If OSHA were actually interested in safe operation, it would grandfather the people who have been operating cranes safely for decades. A history of safe operation of cranes is bound to be a better predictor of future safe operation than a paper exam could ever be.

In the first SBREFA conference call on this rule, August 29, 2006, one of the SERs bluntly stated the advantage of the rule to certain firms that own and operate cranes: "This is a great rule; it will force out the little guys." Though the speaker was intending to emphasize that the rule was anticompetitive, but he was making the background argument: the certification program is expensive, it's a large sunk cost, and small firms are unlikely to be able to recoup that investment because of the small business volume. For those companies like mine that rent cranes, we will be renting from a more concentrated and less competitive market, especially since the market for hourly or daily rentals is necessarily local. We really can't rent from anyone more than one or two hours away.

*3. Non-employer contractors already have incentives to ensure crane safety.*

First, no one wants to see anyone get hurt. Injuries and deaths are not simply a cost of doing business; they are terrible events to be avoided compatibly with producing output at a price homebuyers can afford. However, for those cynics who believe the builders will only reply to economic incentives, those are in place as well.

Whenever there is an injury, the project is delayed. Not could the project lose the use of the crane for the rest of the day, but other workers will lose productivity watching and discussing the accident. If the worker was not part of the crane crew, then that worker's trade may not get anything else done for the rest of day, as a co-worker takes the injured worker to a hospital. In the case of a fatality, the entire site may be shut down, not only out of respect, but also so authorities may conduct an investigation. Death or serious

injury of a worker may result in a trade contractor working with short staff until a skilled substitute can be found. Any or all of this will tend to put the project behind schedule, and late completions cost money. Basically, injuries are bad business; it is in the general contractor's economic interest to reduce or eliminate them.

If the injured worker is employed by the general contractor, the contractor's workers compensation carrier will have to pay a claim, resulting in higher insurance premiums in the future. However, most of the workers on a residential construction site are not employed by the general contractor; they work for one of the sub-contractors. Therefore, those workers can sue the general contractor for tort damages. Trial defense, jury awards, and out of court settlements will be paid by the contractor's liability insurance carrier, but two costs will remain. As with workers compensation, the liability premiums will rise. Perhaps even more important, as anyone who has been a defendant knows, insurance does not begin to cover the cost of being sued. Insurance will not pay for the extra time that has to be devoted to the lawsuit, the company resources involved to supply information to one's lawyers, and the simple "hassle factor" of having this large negative contingency hanging over one's head. People can sue you—unsuccessfully, perhaps—even if it is not your fault that they were injured; but if they are not injured, they cannot sue. A contractor is strongly motivated to reduce accidents in order to reduce tort exposure.

*4. The certificate can only be obtained through a monopoly.*

The proposed standard allows portable certificates to be issued only by a testing organization that has been accredited by a nationally recognized accrediting agency, of which there is only one: the National Commission for the Certification of Crane Operators (NCCCO). The C-DAC was heavily weighted toward large businesses and NCCCO members. Other accrediting agencies could be created, but they would have to be approved by NCCCO. It should be obvious that it's not a good idea to require new competitors to get permission from a monopolist.

NCCCO may believe very sincerely that their standards and approach are correct, but there is no monopoly on good ideas, or on bad ideas, for that matter. Alternative approaches to worker safety will get no fair hearing because they will be challenging the power of entrenched orthodoxy. New ideas also may not be entertained because they would threaten the economic interests of the accrediting agency, or its members.

It would be much better for OSHA to work up a national standard that addresses the actual conditions of crane use and teaches those standards and practices to the people who actually use the cranes, then let state and local governments, trade associations, labor organizations, and civic groups teach those courses. The courses should be available in every county, every year. That easy availability would reduce the expense substantially, and limiting the examination to practical application would keep the jobs open to tens or hundreds of thousands of people who could do the job safely but who would be screened out by the literacy and language barriers.

*5. The certificate requirement is a barrier to my purchase of cranes.*

As I have said, I do not own any cranes, because my business is too small to support that fixed cost. But if some turn of events made crane ownership attractive, this certification requirement would prevent me from buying the cranes anyway. It is too expensive to set up an internal training program that would qualify for the certificate, and it is too expensive to send my employees away for a certificate that they could then use to seek higher wages elsewhere. Even if economists argue that the market will even out eventually, I need to stay in business every year, not just eventually. Eventually, I would be broke.

As it is, I would pay the cost of certification in small pieces, since it will be part of the price hike that one SER characterized as \$12-\$15 per hour. With my 2500 hours of crane usage, that would come to an extra \$30,000 to \$37,500, a far cry above the less than \$400 per establishment included in the PIRFA.

**F. There is an effective, feasible alternative.**

The important goals of saving lives and reducing injuries can be accomplished in more cost-effective ways by devising and applying rules that are appropriate to the equipment that is being used and the risks presented by that equipment. For example, many cranes used in residential construction are relatively small—reach no more than 85 feet and capacity no more than 20 tons. These characteristics are quite similar to forklifts, though forklifts may reach only 50 or 60 feet with capacities up to 10 tons. The existing training requirements for forklifts at 29 CFR 1910.178(l) are very thorough, and they apply to the appropriate equipment. They allow safe operation of forklifts that could present risks of toppling over, dropping a load, striking a person, or making contact with overhead power lines. These are the same risks involved in the operation of cranes. The forklift standard has been in effect more than fifteen years, and there seems to be no pressure to change for lack of effectiveness. Since there is no smoke, it doesn't look there's a fire. The lack of vocalized problems is a sign that the forklift standard appears to be working to protect employee safety.

Enclosed is a comparison of the forklift standard (29 CFR 1910.178(l)) with some language modified to apply to cranes. This should be an excellent starting point for the small cranes that are similar too forklifts and that are used in single-family and light commercial construction—truck-mounted cranes with capacities up to 20 tons and reach up to 85 feet or so. The principles of the standard should be considered for all cranes: employer training for the specific equipment in use, employer assessment off the conditions of the job site and the equipment, and certification by the employer that the training has been done.

Again, I would like to thank you for the opportunity to be included as a Small Entity Representative in this process and would hope that you take my comments to represent those in the home building industry.

If there are any questions regarding my comments please feel free to call me at 316.267.8700. Thank you for your time and consideration.

Sincerely,

Carl L. Harris  
General Manager  
Carl Harris Co., Inc.  
1245 S. Santa Fe  
Wichita, Ks 67211

cc: Bruce Lundegren, SBA  
Dominic Mancini, OIRA

Attachments (4)

## Issues the Panel Would Like You to Consider

### A. General

1. Could changes be made to make the draft proposed standard easier to understand? Are there any specific types of information that OSHA could provide to help employers in this regard?
  - **It is difficult to determine what equipment is covered by this standard and what is not.**
  - **The "rent/lease" distinction is confusing and difficult to follow. OSHA's questions for the Panel are not even consistent in this regard.**
  - **Although powered industrial trucks (forklifts) are excluded from this standard, is this the case when a truss boom with a winch is attached to the forklift? If yes, this will create a significant burden on employers for equipment that is used for the same function, such as lifting wood roof trusses in place, and will require compliance with two separate OSHA standards (i.e. forklift and crane) with two separate sets of requirements. The draft proposed standard would require two different operators, one who has been employer certified to operate a forklift and another that has been "certified" to operate a crane.**
  - **Will material handling (i.e. delivery of drywall by truck-mounted crane with a fork on the end) be covered by this standard? Material delivery should not be within the scope of this rule, because this activity should not be considered "construction, alteration, or repair".**
2. Does the proposed standard include provisions for which compliance may be difficult which would be improved while maintaining employee protection?
  - **Not sure what OSHA is asking for here.**
3. Would any of the proposed requirements cause you to significantly change the way you or others in your industry do things, and what effect would such changes have in terms of time, money, and safety? Please explain and support your conclusions with specific information or examples, if possible.
  - **At present, I lease a crane every time I need one, and I pay for the operator. My understanding from my dealers is that operator training and certification is much more expensive than the PIRFA says. Along with every other small business who leases (we actually rent) cranes with operators, I will be paying much more for the proposed training and operator certification, whose requirements seem excessive.**

### B. Ground Conditions

1. Who typically takes care of correcting insufficient ground conditions? When ground conditions are unsuitable for setting up a crane, do you have problems getting them corrected?
  - **In residential construction, the owner/operator of the crane is responsible for ensuring that ground conditions are suitable for setting up the crane.**
  - **The draft proposed standard requires “controlling entity” (which OSHA considers to be the general contractor of the job) responsible for ensuring that ground preparations (i.e. the ground is able to support the crane) are adequate, sufficient, and to the crane manufactures specifications—this is outside the general contractors/controlling employers area of expertise (and is the reason a crane is rented or leased with knowledgeable operator).**
  - **Often, the general contractors (OSHA has defined them as the “controlling entity”) do not have prior knowledge that a crane will be on a jobsite. For example, a framing subcontractor may set roof trusses in one of three ways: 1) hire a crane to hoist the trusses, 2) use a forklift, or 3) lift them by hand/manpower—and may use a different method depending on the accessibility of equipment.**
2. OSHA estimates that the new regulation would add 30 minutes of a supervisor’s time to assure adequate site assessment. How much time do you spend on site assessment now and who is responsible for it?
  - **I do not believe it is feasible for a general contractor’s superintendent/supervisor to perform a site assessment, as they have little or no knowledge of how cranes operate and function. The owner/operator of the crane is in the best position to conduct this assessment, with possible coordination general contractors/controlling employer.**

#### C. Assembly/Disassembly

1. Who normally supervises the assembly/disassembly process?
  - **Not applicable, there is no A/D for the cranes I lease.**
2. Do you always follow the manufacturer’s instructions for assembly/disassembly?
  - **Not applicable, there is no A/D for the cranes I lease.**

#### D. Power Line Safety

1. In how many jobs does your company work closer than 20 feet to power lines? How many days of the job typically involve working closer than 20 feet to power lines? How many jobs does your company do that require working within 10 feet of a power line? How many days of the job typically require working within 10 feet of a power line?

- **Unknown; I rely on crane owner/operator to check these conditions.**
2. What precautions does your company take to ensure that the minimum allowable clearance from a power line is maintained? Does your company follow the power line safety requirements set forth in the current ANSI standard (B30.5)
    - **This would be the responsibility of the crane rental company and trade contractor who may have hired the crane.**
  3. If your company works closer than 10 feet to power lines, what precautions does your company take to ensure employee safety?
    - **Not applicable.**
  4. OSHA's estimate of the costs of various power line safety measures are given on pages 25 to 28 of PIRFA. Can you improve on these estimates?
    - **The numbers do not add up; it is not possible to add the percentages and come to 100 with the information given. As a result, any final figure would be tainted. In any event, these costs of operating a crane are within the expertise of the crane owner, not the crane lessee; that's why we lease cranes, to outsource these costs and their management.**
    - **It seems completely unnecessary to have a professional engineer determine the position of overhead power lines that are visible to the naked eye. Anyone could stand at a power pole—or between two of them—holding one end of a ten or 20 foot cord and inscribe an area. Likewise, someone could stand by the crane with a measured cord, inscribe an arc or circle around the crane, and see if the path goes under a power line.**

#### E. Inspections

1. The draft proposed standard would require inspections at specific intervals (shift, monthly and annual), and follow certain activities (equipment modification, repair/adjustment, severe service, equipment not in regular use). To what extent is your company already performing similar inspections? What inspections do you currently perform?
  - **Not applicable; inspections are performed by the lessor (i.e. owner/operator) each day.**
2. Do you follow the current ANSI standard for inspection frequency?
  - **I rely on the lessor and the operator provided by the lessor, who are the experts**
3. The proposed standard lists items that must be included in each type of inspection. To what extent is your company already inspecting these items?

- **Not applicable; inspections are performed by the lessor each day.**
- 4. Who currently conducts your inspections and how, if at all, would the draft proposed standard affect your current practices?
- **Not applicable; inspections are performed by the lessor each day.**
- 5. Are the corrective action provisions in the draft proposed standard clear enough to be understood and implemented?
- **Not applicable; inspections are performed by the lessor each day.**
- 6. Does your company keep records of inspections? What would you need to do differently to achieve compliance with the requirements in the draft proposed standard?
- **No.**
- 7. OSHA assumed that daily visual inspections of the crane were standard practice, and took no costs for this inspection requirement. For monthly and annual inspections, and inspections following repairs, OSHA estimated that an additional 15 minutes would be required to meet the new requirements for each of these types of inspections. Could these estimates be improved?
- **Not within lessee's expertise.**

#### F. Fall Protection

1. What fall protection measure does your company currently use to ensure employee safety when on the walking/working surfaces of a crane? Does your company require the use of fall protection equipment? If so, when?
  - **My employees do not walk on the cranes.**
2. The draft proposed standard contains requirements relative to steps, handholds, grab rails, railings, and slip-resistant surfaces. To what extent is your crane already equipped with any of these fall protection devices/aids?
  - a. Are these devices/aids manufacturer installed?
  - b. Where are these aids located on the crane? (e.g. cab access/egress)
  - **Not applicable; my employees do not mount or climb on the cranes.**
3. Do you have cranes equipped with a boom walkway? If so:
  - a. Which types of crane have them, and
  - b. Approximately when were they manufactured?

- **I have no cranes.**

#### G. Operator Certification/Qualification

1. How does your company assess whether an operator is competent to operate a particular crane/derrick? Do you have your own assessment procedure, or do you have the operators certified by a testing organization?
  - **Because we rent/lease cranes with an operator, we rely on the crane rental company.**
2. How many crane/derrick operators do you employ each year?
  - **None. All of our cranes are rented/leased from a crane rental company.**
3. In its preliminary cost estimates, OSHA estimated that certifying a crane operator would require 2 days of a crane operator's time, plus \$500 per operator for training costs, and \$250 for the test itself. This estimate includes time for review and test preparation, as well as the time required to take the test. Could this estimate be improved?
  - **According to the PIRFA, OSHA estimates the cost for operator training for certification/qualifications to be a total of approximately \$1,251 per person with 2 days of a crane operator's time. However, in speaking with our crane rental company, they have stated to pass the National Commission for the Certification of Crane Operators (NCCCO test (or equivalent), it would cost them between \$5,000 to \$10,000 per operator.**
  - **These costs cannot and will not be absorbed by the crane rental company and will be passed on to general contractors, like myself, and therefore increase my cost to hire a crane, by approximately 10-20%.**
  - **The operator "certification" creates a barrier to entry to own a crane for a company like mine. The option in the crane standard for qualification by an audited employer program is not feasible for small business, as they do not have the resources to meet the requirements of national certifying entities for: written testing materials; practical examinations; test administration; grading; facilities/equipment; and personnel (it is estimated that this would cost hundreds of thousands of dollars). Another problem with this option is that it also makes a small business owners/employer liable for the 3rd party operator's actions if they fail to make the proper reports available or are deficient on recordkeeping requirements.**

#### H. Signal Person Qualification

1. Do you have problems with signal persons not knowing how to give or understand signals, or not sufficiently knowing about crane operations? Do most

signal person have a basic understanding of crane operation, including the dynamics involved in swinging and stopping loads?

- **As a general contractor, we do not have any employees signaling the crane.**
- 2. Do you currently train and test signal persons?
- **Not applicable.**

#### I. Costs and Economics

1. How many jobs do you do in the typical year that require cranes or derricks? On average, how long is the crane or derrick on site?
  - **Cranes are used at sites for period from one day to two weeks. My company uses cranes for about 2,500 hours per year.**
2. How many crane/derricks do you own? Do you rent out these cranes or derricks?
  - **Zero.**
3. Do you rent cranes or derricks from others? Do you provide your own operators or rent the crane with an operator? How many time a year do you rent a crane or derrick from others?
  - **Yes. We do not provide our own operators—the operator is supplied by the crane rental company.**
4. How many crane operators do you employ? What is the annual turnover in crane operators?
  - **Zero.**
5. Please review and provide comments on the specific unit estimates used by OSHA to determine costs and impact associated with the draft proposed standard, as summarized in Table 7. Note that costs are calculated only for the proposed requirements not already required by the existing standard.
  - **Table 7 is problematic. I do not know the breakdown of crane operating costs, because I do not manage them; this is outsourced to the crane rental company. However, the table only appears to account for 60 percent of crane or derrick uses.**
  - **Table 7 has questionable applicability to residential construction, since OSHA as assumed that residential construction neither owns nor leases any cranes at all, except for the 168 single-family builders who rent out cranes.**

#### J. Alternatives

1. Pages 32 to 35 of the Preliminary Initial Regulatory Flexibility Analysis (PIRFA) describes several alternative to the draft proposed standard that were considered by OSHA and the Cranes and Derricks Negotiated Rulemaking Advisory Committee (C-DAC). These pages also contain C-DAC's and OSHA's rationale for not adopting the alternatives. We would appreciate your ideas on these and any other alternative you believe OSHA should consider. While the Panel actively encourages you to think about a full range of alternatives to the draft proposal, please bear in mind that any alternative selected must fully protect employee safety.
  - **A practical alternative would be to apply the training and employer certification requirements of the fork-lift standard to cranes of similar reach and capacity, since they perform similar tasks their risk profiles would be similar. Thus the existing fork-lift standard could be applied to hydraulic cranes with capacities no greater than 20 tons and height and reach of no more than 100 feet, the characteristics of small hydraulic truck cranes now on the market.**
  - **This option would require OSHA to develop a performance standard that defines minimum criteria and knowledge needed. *OSHA has done this in another regulation: the powered industrial truck (forklift) standard (29 CFR 1926.602)***
  - **The ways in which forklifts are used in residential construction are almost identical to the use of small cranes (such as lifting roof trusses) and the characteristics of forklifts and cranes are quite similar.**
  - **OSHA's powered industrial truck operator training requirements are performance-oriented to permit employers to tailor a training program to the characteristics of their workplaces and the particular types of powered industrial trucks operated.**
  - **OSHA's forklift standard requires that forklift operators are competent to operate the forklift safely, as demonstrated by successful completion of the training *and* evaluation specified in the OSHA standard.**
  - **Prior to permitting an employee to operate a forklift (except for training purposes), the employer must ensure that each operator has successfully completed the required training (or previously received appropriate training).**
  - **Training consists of a combination of:**
    - **Formal instruction (e.g., lecture, discussion, interactive computer learning, written material),**
    - **Practical training (demonstrations and exercises performed by the trainee), and**
    - **Evaluation of the operator's performance in the workplace**
  - **Training and evaluation is conducted by a person with the knowledge, training and experience to train powered industrial truck operators and evaluate their competence.**

- **The employer certifies that each operator has been trained and evaluated as required by the standard and this standard does not require the use of testing/evaluation by a nationally recognized accrediting agency.**
2. Are there difference in small business practice such that small businesses could be exempted from any portion of the draft proposed standard without the loss of worker protection (please explain your answer)?
- **It is the size and use of the crane that determine the risks, not the size of the business. However, large, indivisible expenses like training are much harder for businesses to bear when their cash flow is small, which is more often the case with small businesses than with large ones. A small crane operator is required to meet the same certification requirements as an operator of a several hundred ton crane, certification requirements should be graduated based on load capacity.**
  - **OSHA should consider regulating cranes based on the type of equipment, the working environment, and risk involved. For example, using a boom truck rated at 10,000 pounds lifting a 500 pound roof trusses on a single family home on a 1 acre lot should be regulated differently than a 100,000 pound hammerhead tower crane lifting 5,000 pound steel beams in downtown Washington, DC. The materials are different, the working environment is different, the risks workers face are different, the potential for accidents is different, the severity of the accidents are different, and the regulations should take into account these differences.**
  - **Some attempt should be made to have two or three classifications of cranes/ usages that are based upon potential for accidents or potential of those accidents being serious.**

#### K. Documentation

1. The OSHA draft proposed standard contains recordkeeping requirements including documenting certain inspections, deficiencies in audited employer qualification programs (1427), signal person qualifications (1428), post-assembly testing of new or reinstalled derricks (1436), and part replacement orders relative to operational aids (1416).
- a. What kinds of recordkeeping does your company already perform? For example, does your company keep records of inspections?
  - b. Do you feel that documentation should be required for some additional requirements in the draft proposed standard?
  - c. Are the recordkeeping requirements in the draft proposed standard clear?
  - d. Do you feel that any of these documentation requirements are unnecessary (please explain your answer)?
- **Not applicable.**

**OSHA 1910.178  
Powered Industrial Trucks**

**1910.178(l) (1) Safe Operation**

**1910.178(l)(1)(i)** The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (l)

**1910.178(l)(1)(ii)** Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (l), except as permitted by paragraph (l) (5).

**1910.178(l)(2) Training Program Implementation**

**1910.178(l)(2)(i) Trainees may operate a powered industrial truck only:**

**1910.178 (l)(2)(i)(A)** Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

**1910.178 (l)(2)(i)(B)** Where such operation does not endanger the trainee or other employees.

**1910.178 (l)(2)(ii)** Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the work place

**1910.178 (l)(2)(iii)** All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

**1910.178 (l)(3) Training program content.**

Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

**1910.178(l)(3)(i) Truck-related topics:**

**1910.178 (l)(3)(i)(A)** Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;

**1910.178 (l)(3)(i)(B)** Differences between the truck and the automobile;

**Similar language for crane operator in  
Construction**

**Safe Operation**

**1926.550(X)(1)(i)**The employer shall ensure that each crane operator is competent to operate a crane safely, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (x)

**1926.550(X)(1)(ii)** Prior to permitting an employee to operate a crane (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (x), except as permitted by paragraph (x) (x). (x)

**1926.550(X)(2) Training Program Implementation**

**1926.550(X)(2)(i) Trainees may operate a crane only:**

**1926.550(X)(2)(i)(A)**Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

**1926.550(X)(2)(i)(B)** Where such operation does not endanger the trainee or other employees.

**1926.550(X)(2)(ii)** Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the work place

**1926.550(X)(2)(iii)** All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

**1926.550(X)(3) Training program content.**

Crane operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the crane in the employer's workplace.

**1926.550(X)(3)(i) Crane-related topics:**

**1926.550(X)(3)(i)(A)** Operating instructions, warnings, and precautions for the types of cranes the operator will be authorized to operate;

**1926.550(X)(3)(i)(B)** Differences between the crane and other types of hoisting or lifting equipment currently or recently on the job site;

**1910.178 (I)(3)(I)(C)** Truck controls and instrumentation: where they are located, what they do, and how they work;

**1910.178 (I)(3)(i)(D)** Engine or motor operation;

**1910.178 (I)(3)(i)(E)** Steering and maneuvering;

**1910.178 (I)(3)(i)(F)** Visibility (including restrictions due to loading);

**1910.178 (I)(3)(I)(G)** Fork and attachment adaptation, operation, and use limitations;

**1910.178 (I)(3)(i)(H)** Vehicle capacity;

**1910.178 (I)(3)(i)(I)** Vehicle stability;

**1910.178 (I)(3)(i)(J)** Any vehicle inspection and maintenance that the operator will be required to perform;

**1910.178 (I)(3)(i)(K)** Refueling and/or charging and recharging of batteries;

**1910.178 (I)(3)(i)(L)** Operating limitations;

**1910.178 (I)(3)(i)(M)** Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

**1910.178 (I)(3)(ii)** Workplace-related topics:

**1910.178 (I)(3)(ii)(A)** Surface conditions where the vehicle will be operated;

**1910.178 (I)(3)(ii)(B)** Composition of loads to be carried and load stability;

**1910.178 (I)(3)(ii)(C)** Load manipulation, stacking, and unstacking;

**1910.178 (I)(3)(ii)(D)** Pedestrian traffic in areas where the vehicle will be operated;

**1910.178 (I)(3)(ii)(E)** Narrow aisles and other restricted places where the vehicle will be operated;

**1910.178 (I)(3)(ii)(F)** Hazardous (classified) locations where the vehicle will be operated;

**1910.178 (I)(3)(ii)(G)** Ramps and other sloped surfaces that could affect the vehicle's stability;

**1910.178 (I)(3)(ii)(H)** Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;

**1926.550(X)(3)(i)(C)** Crane controls and instrumentation: where they are located, what they do, and how they work;

**1926.550(X)(3)(i)(D)** Engine or motor operation;

**1926.550(X)(3)(i)(E)** Steering and maneuvering, including issues of sway and avoidance of overhead power lines;

**1926.550(X)(3)(i)(F)** Visibility (including restrictions due to work area, load, or crane body);

**1926.550(X)(3)(i)(G)** Rigging, operation, and use limitations;

**1926.550(X)(3)(i)(H)** Crane capacity;

**1926.550(X)(3)(i)(I)** Crane stability;

**1926.550(X)(3)(i)(J)** Crane inspection and maintenance that the operator will be required to perform including required documentation.

**1926.550(X)(3)(i)(K)** Refueling and other fluid levels

**1926.550(X)(3)(i)(L)** Operating limitations;

**1926.550(X)(3)(i)(M)** Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of crane that the employee is being trained to operate.

**1926.550(X)(3)(ii)** Workplace-related topics:

**1926.550(X)(3)(ii)(A)** Ground conditions that are necessary for safe operation of the crane;

**1926.550(X)(3)(ii)(B)** Composition of loads to be lifted and load stability;

**1926.550(X)(3)(ii)(C)** Overhead power lines, including location, the safe operating distance, and checking whether the line has been de-energized;

**1926.550(X)(3)(ii)(D)** Working with spotters, including signals or other communication, as appropriate to the jobsite

**1926.550(X)(3)(ii)(E)** Designating a clear area that all persons must stay out of during lifts;

see (F) below

see (F) below

see (F) below

**1910.178 (I)(3)(ii)(I)** Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

**1910.178 (I)(3)(iii)** The requirements of this section.

**1910.178 (I)(4) Refresher training and evaluation.**

**1910.178 (I)(4)(i)** Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (I)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

**1910.178 (I)(4)(ii)** Refresher training in relevant topics shall be provided to the operator when:

**1910.178 (I)(4)(ii)(A)** The operator has been observed to operate the vehicle in an unsafe manner;

**1910.178 (I)(4)(ii)(B)** The operator has been involved in an accident or near-miss incident;

**1910.178 (I)(4)(ii)(C)** The operator has received an evaluation that reveals that the operator is not operating the truck safely;

**1910.178 (I)(4)(ii)(D)** The operator is assigned to drive a different type of truck; or

**1910.178 (I)(4)(ii)(E)** A condition in the workplace changes in a manner that could affect safe operation of the truck.

**1910.178 (I)(4)(iii)** An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

**1910.178 (I)(5) Avoidance of duplicative training.** If an operator has previously received training in a topic specified in paragraph (I)(3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

**19178 (I)(6) Certification.** The employer shall certify that each operator has been trained and evaluated as required by this paragraph (I). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation

**1910.178 (I)(7) Dates.** The employer shall ensure that operators of powered industrial trucks are trained, as appropriate, by the date shown in the following table.

**1926.550(X)(3)(ii)(F)** Other unique or potentially hazardous environmental or physical conditions in the workplace that could affect safe operation.

na

**1926.550(X)(4) Refresher training and evaluation.**

**1926.550(X)(4)(i)** Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (X)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the crane safely.

**1926.550(X)(4)(ii)** Refresher training in relevant topics shall be provided to the operator when:

**1926.550(X)(4)(ii)(A)** The operator has been observed to operate the crane in an unsafe manner;

**1926.550(X)(4)(ii)(B)** The operator has been involved in a crane accident or near-miss incident;

**1926.550(X)(4)(ii)(C)** The operator has received an evaluation that reveals that the operator is not operating the crane safely;

**1926.550(X)(4)(ii)(D)** The operator is assigned to operate a different type of crane; or

**1926.550(X)(4)(ii)(E)** A condition in the workplace changes in a manner that could affect safe operation of the crane.

**1926.550(X)(4)(iii)** An evaluation of each crane operator's performance shall be conducted at least once every year.

**1926.550(X)(5) Avoidance of duplicative training.** If an operator has previously received training in a topic specified in paragraph (x)(x) of this section, and such training is appropriate to the crane and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the crane safely.

**1926.550(X)(6) Certification.** The employer shall certify that each operator has been trained and evaluated as required by this paragraph (x). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation

**1926.550(X)(7) Dates.** The employer shall ensure that operators of cranes are trained, as appropriate, by the date shown in the following table.

<b>If the Employee was hired:</b>	The initial training and evaluation of that employee must be completed:	<b>If the Employee was hired:</b>	The initial training and evaluation of that employee must be completed:
Before December 1, 1999	By December 1, 1999	Before December 1, 2006	By December 1, 2006
After December 1, 1999	Before the employee is assigned to operate a powered industrial truck	After December 1, 2006	Before the employee is assigned to operate a powered industrial truck

**1910.178(l)(8)** Appendix A to this section provides non-mandatory guidance to assist employers in implementing this paragraph (l). This appendix does not add, alter, or reduce the requirements of this section.

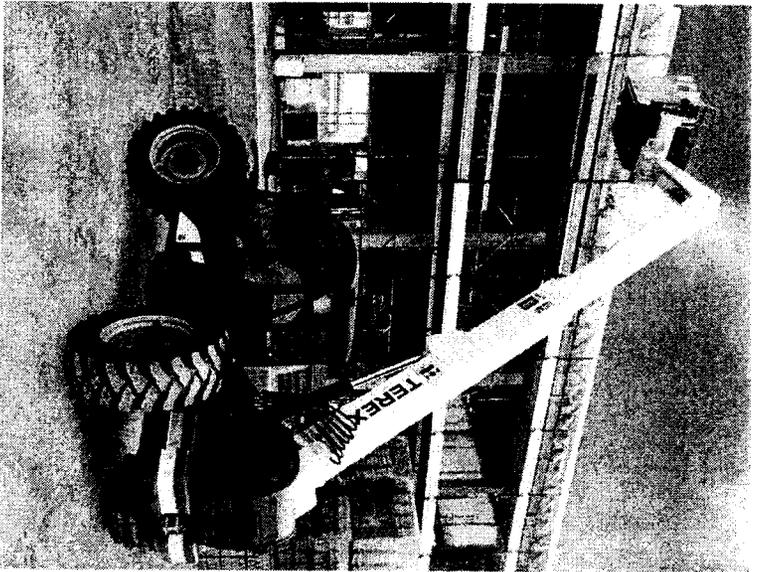
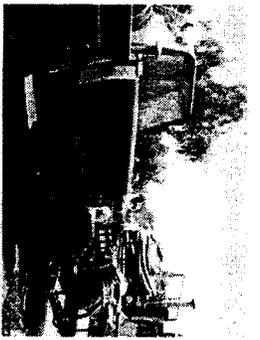
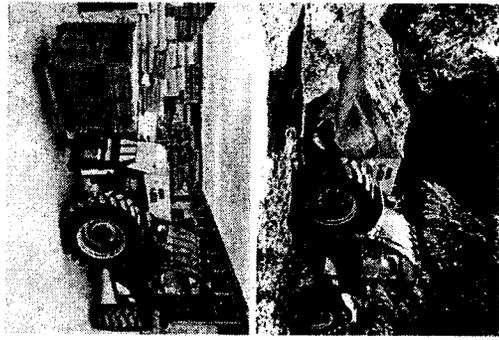
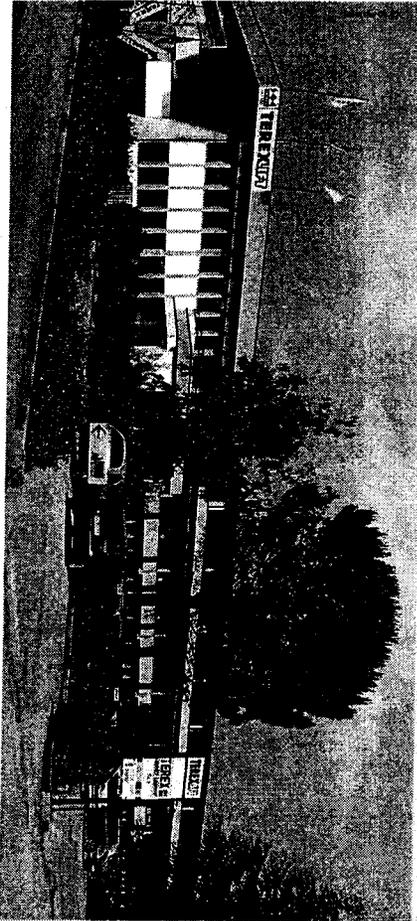
**1926.550(x)(8)** Appendix A to this section provides non-mandatory guidance to assist employers in implementing this paragraph (x). This appendix does not add, alter, or reduce the requirements of this section.



TEREX COMPACT ITALIA

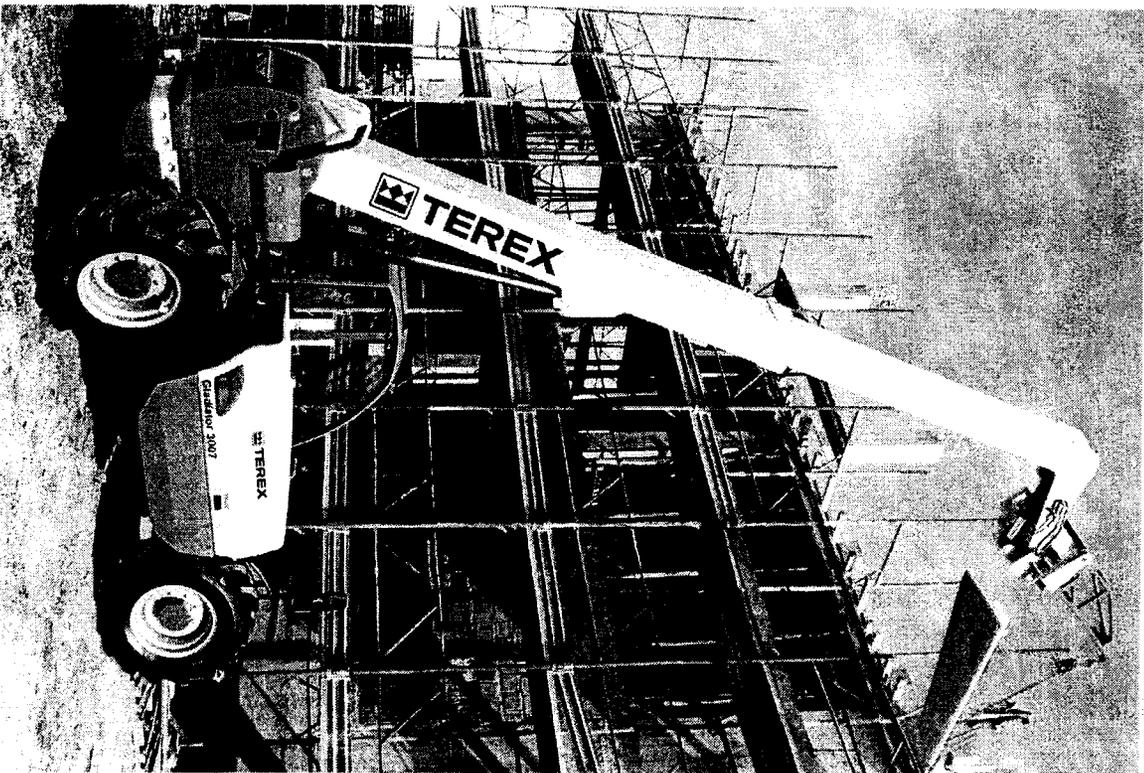
TEREXQUIP s.r.l.

Zona Industriale - 06019 Umbertide - Perugia, Italy  
Tel. +39 075 941811 - Fax +39 075 9418101  
www.terex.it - e-mail: terex@terex.it



 **TEREX**

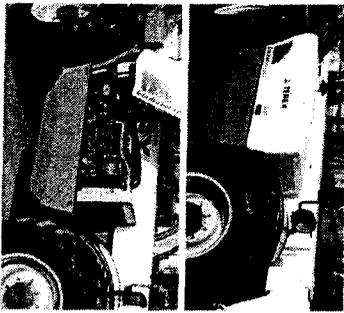
Gladiator | 3.0 T / 7 m.





**Braccio**  
Il braccio articolato (braccio snello) è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m. Il braccio è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m. Il braccio è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

**Booma**  
Il braccio articolato (braccio snello) è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m. Il braccio è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.



**Motori**  
Il motore è un motore diesel a iniezione diretta. La sua potenza è di 145 kW. Il motore è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

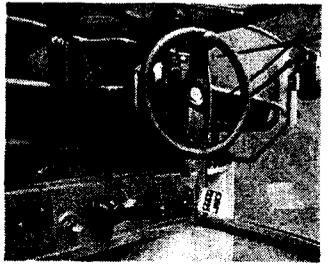
**Trasmissione**  
La trasmissione è a innescamento meccanico. La sua potenza è di 145 kW. La trasmissione è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

**Altezza**  
L'altezza è di 2,20 m. L'altezza è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

**Dimensioni**  
Le dimensioni sono di 2,20 m di altezza e 2,05 m di larghezza. Le dimensioni sono in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

**Accessori di serie**  
Gli accessori di serie sono in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

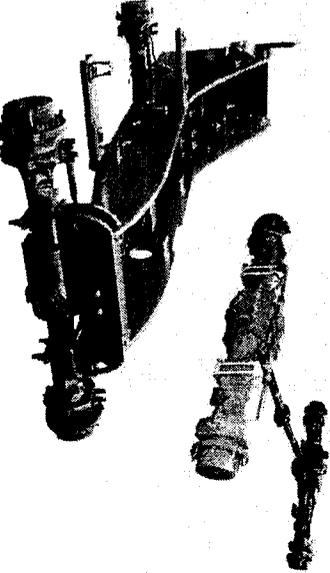
**Cabina**  
La cabina è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m. La cabina è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.



**Cab**  
La cabina è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m. La cabina è in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.



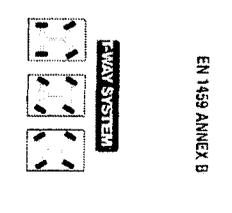
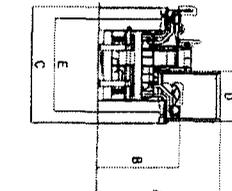
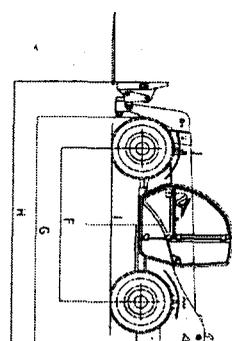
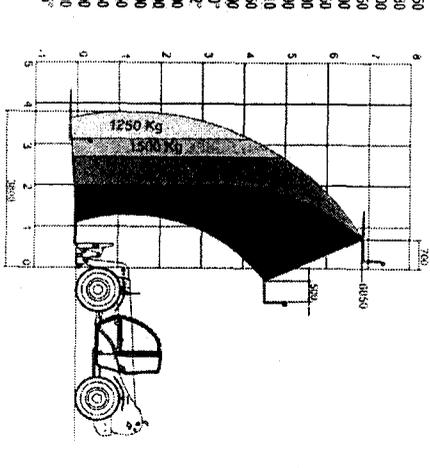
**Dimensioni**  
Le dimensioni sono di 2,20 m di altezza e 2,05 m di larghezza. Le dimensioni sono in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.



**Figura**  
L'immagine mostra i componenti principali dell'excavatore. La sua lunghezza è di 21,0 m.

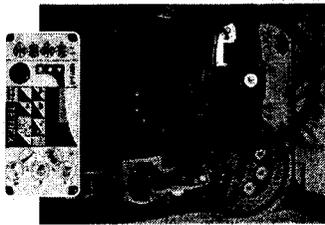
**Accessori di serie**  
Gli accessori di serie sono in grado di sollevare carichi pesanti. La sua lunghezza è di 21,0 m.

Altezza - Height	2050
A	2050
B	1330
C	2000
D	860
E	1630
F	2650
G	4080
H	4690
I	410
J	2200/4050
K	6500
L	90°
M	42°
N	6000
O	3000
P	2500
Q	1250
R	650
S	700
T	3800
U	135°



**EN 1459 ANNEX B**  
Il diagramma EN 1459 ANNEX B mostra i dati di sollevamento dell'excavatore. La sua lunghezza è di 21,0 m.





**Controls**

Controls are comprehensive, a variety of ROPS-ROPS and a safety standard required for several other applications. The controls are designed for maximum operator comfort and safety. The controls are designed for maximum operator comfort and safety. The controls are designed for maximum operator comfort and safety.

**Cab**

The new and comfortable cab is ROPS-ROPS certified and has been designed according to state-of-the-art standards. The cab is designed for maximum operator comfort and safety. The cab is designed for maximum operator comfort and safety.

**Stability monitoring system**

The stability monitoring system is designed to monitor the stability of the machine during operation. It provides a visual and audible warning when the machine becomes unstable. The stability monitoring system is designed to monitor the stability of the machine during operation.



**Excavator**

The excavator is a 360-degree rotating machine with a hydraulic system. It is designed for maximum operator comfort and safety. The excavator is a 360-degree rotating machine with a hydraulic system.

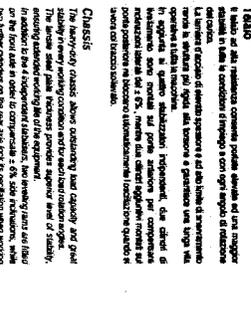
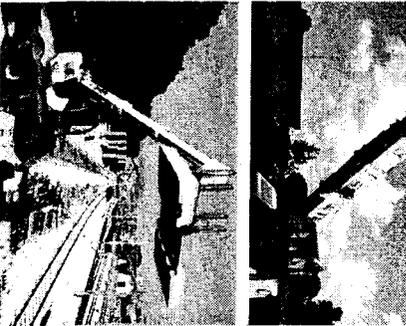


**Hydraulic**

The hydraulic system is designed for maximum operator comfort and safety. It provides a visual and audible warning when the machine becomes unstable. The hydraulic system is designed for maximum operator comfort and safety.

**Figuring**

The figuring system is designed to monitor the stability of the machine during operation. It provides a visual and audible warning when the machine becomes unstable. The figuring system is designed to monitor the stability of the machine during operation.

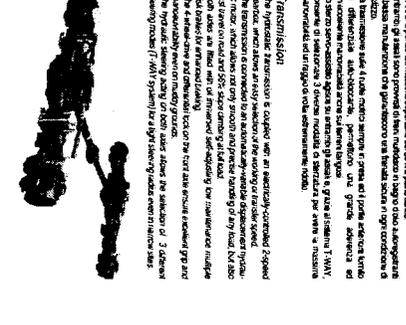


**Radio**

The radio system is designed for maximum operator comfort and safety. It provides a visual and audible warning when the machine becomes unstable. The radio system is designed for maximum operator comfort and safety.

**Chassis**

The chassis is designed for maximum operator comfort and safety. It provides a visual and audible warning when the machine becomes unstable. The chassis is designed for maximum operator comfort and safety.

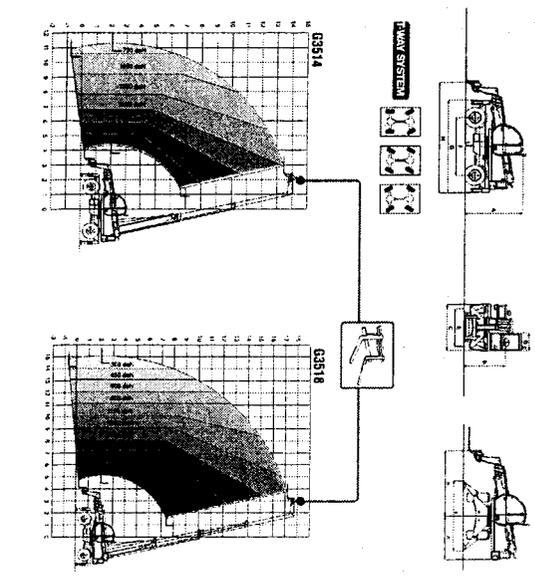


**Transmission**

The transmission is designed for maximum operator comfort and safety. It provides a visual and audible warning when the machine becomes unstable. The transmission is designed for maximum operator comfort and safety.

The hydraulic transmission is coupled with an American-made engine. It provides a visual and audible warning when the machine becomes unstable. The hydraulic transmission is coupled with an American-made engine.

	CS314	CS318
A. Max. weight	2800	2950
B. Max. height	2075	2275
C. Max. width	2100	2310
D. Max. depth	1690	1830
E. Max. length	4880	4880
F. Max. height	5790	6525
G. Max. width	310	370
H. Max. depth	3600	3600
I. Max. length	2280	2280
J. Max. height	2280	2280
K. Max. width	2280	2280
L. Max. depth	2280	2280
M. Max. length	2280	2280
N. Max. height	2280	2280
O. Max. width	2280	2280
P. Max. depth	2280	2280
Q. Max. length	2280	2280
R. Max. height	2280	2280
S. Max. width	2280	2280
T. Max. depth	2280	2280
U. Max. length	2280	2280
V. Max. height	2280	2280
W. Max. width	2280	2280
X. Max. depth	2280	2280
Y. Max. length	2280	2280
Z. Max. height	2280	2280
AA. Max. width	2280	2280
AB. Max. depth	2280	2280
AC. Max. length	2280	2280
AD. Max. height	2280	2280
AE. Max. width	2280	2280
AF. Max. depth	2280	2280
AG. Max. length	2280	2280
AH. Max. height	2280	2280
AI. Max. width	2280	2280
AJ. Max. depth	2280	2280
AK. Max. length	2280	2280
AL. Max. height	2280	2280
AM. Max. width	2280	2280
AN. Max. depth	2280	2280
AO. Max. length	2280	2280
AP. Max. height	2280	2280
AQ. Max. width	2280	2280
AR. Max. depth	2280	2280
AS. Max. length	2280	2280
AT. Max. height	2280	2280
AU. Max. width	2280	2280
AV. Max. depth	2280	2280
AW. Max. length	2280	2280
AX. Max. height	2280	2280
AY. Max. width	2280	2280
AZ. Max. depth	2280	2280
BA. Max. length	2280	2280
BB. Max. height	2280	2280
BC. Max. width	2280	2280
BD. Max. depth	2280	2280
BE. Max. length	2280	2280
BF. Max. height	2280	2280
BG. Max. width	2280	2280
BH. Max. depth	2280	2280
BI. Max. length	2280	2280
BJ. Max. height	2280	2280
BK. Max. width	2280	2280
BL. Max. depth	2280	2280
BM. Max. length	2280	2280
BN. Max. height	2280	2280
BO. Max. width	2280	2280
BP. Max. depth	2280	2280
BQ. Max. length	2280	2280
BR. Max. height	2280	2280
BS. Max. width	2280	2280
BT. Max. depth	2280	2280
BU. Max. length	2280	2280
BV. Max. height	2280	2280
BW. Max. width	2280	2280
BX. Max. depth	2280	2280
BY. Max. length	2280	2280
BZ. Max. height	2280	2280
CA. Max. width	2280	2280
CB. Max. depth	2280	2280
CC. Max. length	2280	2280
CD. Max. height	2280	2280
CE. Max. width	2280	2280
CF. Max. depth	2280	2280
CG. Max. length	2280	2280
CH. Max. height	2280	2280
CI. Max. width	2280	2280
CJ. Max. depth	2280	2280
CK. Max. length	2280	2280
CL. Max. height	2280	2280
CM. Max. width	2280	2280
CN. Max. depth	2280	2280
CO. Max. length	2280	2280
CP. Max. height	2280	2280
CQ. Max. width	2280	2280
CR. Max. depth	2280	2280
CS. Max. length	2280	2280
CT. Max. height	2280	2280
CU. Max. width	2280	2280
CV. Max. depth	2280	2280
CW. Max. length	2280	2280
CV. Max. height	2280	2280
CV. Max. width	2280	2280
CV. Max. depth	2280	2280



**Jerry Anderson**  
**Anderson Construction**

September 7, 2006

Mr. Robert Burt  
Chairman, Small Business Advocacy Review Panel  
Occupational Safety and Health Administration  
U.S. Department of Labor  
Room - N3641  
200 Constitution Ave, N.W.  
Washington D.C. 20210

Dear Mr. Burt,

I would like to thank you and the Small Business Advocacy Review Panel for appointing me as a Small Entity Representative (SER) for the Cranes and Derricks in Construction Small Business Review Enforcement Fairness Act (SBREFA) Panel. As a small business owner, the safety and health of my employees have always been a core component in my work as a general contractor.

Anderson Construction Company is a small general contractor operating mainly in Southwest Georgia, Southeast Alabama and Northwest Florida. This is a very rural area, mostly agricultural lands, with very little high-rise type development.

Most of our building construction work is comprised of one-story, seldom over two-story, buildings. We need the use of a crane for short periods of time on many of our projects and consequently several years ago, we bought a used crane in excellent shape, and trained a mechanic to operate and maintain it. After reviewing the proposed crane operator certification requirements and faced with the costs of upgrading the crane to meet mechanical requirements within the proposed standard, we have made the decision to sell our crane, and find a certified rental company in this area if the proposed standard does not change.

To summarize a few of my concerns, I will address some of the "Issues the Panel Would like You to Consider" as an outline:

**A. General**

- 1. Could changes be made to make the draft proposed standard easier to understand? Are there any specific types of information that OSHA could provide to help employers in this regard?*

I believe that the draft proposed standard is not too difficult to understand. However, at 119 pages long, single spaced with 10 pt type, it is too voluminous for a typical small business firm to examine. The standard will create added cost to a small business in the form of additional staff or a consultant to oversee the new compliance mandates.

2. *Does the proposed standard include provisions for which compliance may be difficult which would be improved while maintaining employee protection?*

This question does not make sense

3. *Would any of the proposed requirements cause you to significantly change the way you or others in your industry do things, and what effect would such changes have in terms of time, money, and safety? Please explain and support your conclusions with specific information or examples, if possible.*

As a small general contractor most of our building construction work is one-story, and seldom over two-stories. We use cranes for short periods of time on many of our projects. Several years ago, we bought a used crane in excellent shape and trained a mechanic to operate and maintain the equipment. The mechanic is an excellent operator and is very safety conscious while performing his duties. Unfortunately he is not well educated and would have difficulty passing any type of written examination. We would have to lay off our crane operator due to requirements established by OSHA in this draft proposed standard.

After reviewing much of the information in the draft proposed standard, there would be significant changes that would need to be addressed within the construction industry and for many general contractors. The large amount of information to absorb and comply with, such as the crane operator certification, would cost a small business a significant amount. The cost for the crane operator certification and qualification in Section 1427 would cost several thousands of dollars per crane operator, depending on location of the training and exam (See G. Operator Certification/Qualification, Question #3.)

## **B. Ground Conditions**

1. *Who typically takes care of correcting insufficient ground conditions? When ground conditions are unsuitable for setting up a crane, do you have problems getting them corrected?*

The problem with ground conditions is not one simply resolved by making the controlling contractor responsible. The conditions may vary due to various reasons. The controlling contractor may not be able to control all these scenarios. All parties involved in the crane operations need to be involved in the process.

2. *OSHA estimates that the new regulation would add 30 minutes of a supervisor's time to assure adequate site assessment. How much time do you spend on site assessment now and who is responsible for it?*

Adding 30 minutes to a supervisor's time to assure adequate site assessment is not the issue. The whole team needs to have input to assess the operations, including the crane operator. It becomes a larger issue of time constraints, costs involving

multiple cranes (due to restraints or load restraints), etc.

### **C. Assembly/Disassembly**

1. *Who normally supervises the assembly/disassembly process?*

Our crane does not require breaking down for travel

2. *Do you always follow the manufacturer's instructions for assembly/disassembly?*

Our crane does not require breaking down for travel

### **D. Power Line Safety**

1. *In how many jobs does your company work closer than 20 feet to power lines? How many days of the job typically involve working closer than 20 feet to power lines? How many jobs does your company do that require working within 10 feet of a power line? How many days of the job typically require working within 10 feet of a power line?*

We seldom are required to work close to power lines

2. *What precautions does your company take to ensure that the minimum allowable clearance from a power line is maintained? Does your company follow the power line safety requirements set forth in the current ANSI standard (B30.5)*

Yes

3. *If your company works closer than 10 feet to power lines, what precautions does your company take to ensure employee safety?*

We never work closer than 10 feet from power lines

4. *OSHA's estimate of the costs of various power line safety measures are given on pages 25 to 28 of PIRFA. Can you improve on these estimates?*

OSHA's cost estimates cost for various power line safety measures appear to have included only actual on-site estimates but do not include the other aspects such as travel ( to and from locations) for the various entities involved ( i.e. engineer, and the mobilization of the various barricades, lines, etc.) to be used. Once again, OSHA has not taken all cost into consideration.

### **E. Inspections**

1. *The draft proposed standard would require inspections at specific intervals (shift, monthly and annual), and follow certain activities (equipment modification, repair/adjustment, severe service, equipment not in regular use). To what extent is*

*your company already performing similar inspections? What inspections do you currently perform?*

I believe the required inspections would make our operations safer and I would not have difficulty accepting them. My operator inspects his crane daily. We have our crane inspected and certified once a year by an outside company. We would have our boom recertified, if we made major repairs.

2. *Do you follow the current ANSI standard for inspection frequency?*
3. *The proposed standard lists items that must be included in each type of inspection. To what extent is your company already inspecting these items?*
4. *Who currently conducts your inspections and how, if at all, would the draft proposed standard affect your current practices?*
5. *Are the corrective action provisions in the draft proposed standard clear enough to be understood and implemented?*
6. *Does your company keep records of inspections? What would you need to do differently to achieve compliance with the requirements in the draft proposed standard?*

We currently keep records of our major inspections, however, with the draft proposed standard; we would have to increase the amount of recordkeeping we already perform. The amount of recordkeeping needed to comply with this draft proposed standard would require hiring of new personnel and would be cost prohibitive. As mentioned during the SBREFA Panel conference call, held on August 31, 2006, there are many references made throughout the document that states that the "employer must" or that the "employer shall" or "should." Not all of these references are areas that an employer would normally keep records; however, many employers would keep records on these various portions due to the language in the draft proposed standard, for future reference. This ambiguity in language (not directly stating that records shall be kept but implying such), only causes more of a burden on the employer.

7. *OSHA assumed that daily visual inspections of the crane were standard practice, and took no costs for this inspection requirement. For monthly and annual inspections, and inspections following repairs, OSHA estimated that an additional 15 minutes would required to meet the new requirements for each of these types of inspections. Could these estimates be improved?*

OSHA's estimates do not take into account the additional documentation and record keeping involved with the new requirement. I don't believe that the monthly inspections and the annuals would add only an additional 15 minutes.

## F. Fall Protection

1. *What fall protection measure does your company currently use to ensure employee safety when on the walking/working surfaces of a crane? Does your company require the use of fall protection equipment? If so, when?*
2. *The draft proposed standard contains requirements relative to steps, handholds, grab rails, railings, and slip-resistant surfaces. To what extent is your crane already equipped with any of these fall protection devices/aids?*
  - a. *Are these devices/aids manufacturer installed?*
  - b. *Where are these aids located on the crane? (e.g. cab access/egress)*
3. *Do you have cranes equipped with a boom walkway? If so:*
  - a. *Which types of crane have them, and*
  - b. *Approximately when were they manufactured?*

## G. Operator Certification/Qualification

1. *How does your company assess whether an operator is competent to operate a particular crane/derrick? Do you have your own assessment procedure, or do you have the operators certified by a testing organization?*

We own a small crane and have trained a mechanic to maintain and operate our crane. He has been trained on this crane specifically and trained to perform the specific duties required to complete our jobs. Our operator has years of hands on experience and training. His abilities to safely operate the crane would not be improved by taking an examination for certification.

2. *How many crane/derrick operators do you employ each year?*

We have one crane operator.

3. *In its preliminary cost estimates, OSHA estimated that certifying a crane operator would require 2 days of a crane operator's time, plus \$500 per operator for training costs, and \$250 for the test itself. This estimate includes time for review and test preparation, as well as the time required to take the test. Could this estimate be improved?*

I recognize that OSHA has provided estimates for what they consider as the most conservative option (Section 1427(a)), however, there are three additional options available and data should be provided to determine what it is the most conservative option. I cannot make a proper determination without reviewing all of the information available. According to research that has been done by the AGC of Texas, estimates have been provided which approximates that a program to be accredited by a nationally recognized accrediting agency would cost an organization approximately \$250,000-\$500,000, plus annual maintenance. Additionally, CCO stated that it took more than four years and over \$500,000 to

create their program. Though an option, it would not be cost effective for a small business owner to hold an accredited training and exam onsite due to having a limited number of crane operators.

The cost estimates for certification and qualifications provided by OSHA appear to only include the costs for the external test preparation course. However, it does not address the internal cost to the employer such as replacement workers or production down time to the employer. There is also no suggestion that such costs are addressed in the longer list of options for certification and qualifications in the draft standard.

According to the PIRFA, OSHA estimates the cost for operator training for certification/qualifications to be a total of approximately \$1,251 per person with 2 days of a crane operator's time. However according to my research done over the internet and with the training resources provided by the NCCCO website, 18 providers were contacted and the average time for a crane operator would be 5 days for training and exams. The average cost for a crane operator would be approximately \$2,900 per person for training, exam and wages. The average cost for the exams are \$382, with training or prep costs averaging at \$1,260 and wages for the operator of \$1,255. Additional costs for math and reading classes, if needed, would be averaged at \$750, which was not been factored into the total cost of \$2,900.

An example of the cost for certification and training provided by another general contractor that I occasionally work with stated that the cost of the exams (written and practical) and prep class was \$1,375.00 The total cost of wages, loss of production, travel and lodging and the training and certification exams was \$5,068.20 per person. The breakdown of costs included –

#### Crane Operator Certification

Prep	
Written Exam	
Practical Exam	
TOTAL:	\$1,375.00 per person

#### Wages & Benefits

2 days @ 8 hrs x \$20 per hour	\$ 320.00
3 days @ 8 hrs x \$30 per hour	\$ 720.00
Benefits 35%	\$ 364.00

#### Travel Time

6 hrs @ \$20 per hour	\$ 120.00
8 hrs @ \$30 per hour	\$ 240.00
Benefits 35%	\$ 126.00

#### Expenses

Hotel – 3 nights @ \$60 per night	\$ 180.00
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Food - \$50 per day x 5 days	\$ 250.00
Vehicle Allowance Mileage (2 trucks – 930 miles @ \$ .44 per mile)	\$ 204.00
<b>Safety Department</b>	
5 days @ \$250 = 1,250 divided by 4	\$ 312.00
Benefits 35%	\$ 109.20
Lost Production for 2 days (Profit)	\$ 748.00
<b>TOTAL COST OF CRANE CERTIFICATION PER PERSON</b>	<b>\$ 5,068.20</b>

## H. Signal Person Qualification

1. *Do you have problems with signal persons not knowing how to give or understand signals, or not sufficiently knowing about crane operations? Do most signal person have a basic understanding of crane operation, including the dynamics involved in swinging and stopping loads?*

We have not had problems with signal persons. Signal persons on our jobs have sufficient knowledge.

2. *Do you currently train and test signal persons?*

Yes, we provide on the job training. I believe that this is critical to incorporate for the safety of the operations.

## I. Costs and Economics

1. *How many jobs do you do in the typical year that require cranes or derricks? On average, how long is the crane or derrick on site?*

Approximately 12-15 jobs per year, with 1-2 weeks usage per job.

2. *How many crane/derricks do you own? Do you rent out these cranes or derricks?*

We own one small crane and do not rent it out. While it is difficult to pinpoint the exact cost associated with the changes that would happen if the draft proposed standard is implemented, we have reviewed our files to determine the approximate cost associated with the time our crane has been used in the past three years; compared that with the cost for renting a crane and the anticipated cost would be an additional \$48,000 annually for our company. The breakdown of cost follows:

**Anderson Construction Company**  
**Manitex 35 Ton Crane**  
**Assumptions - Crane Rental Costs vs. Self-Owned and Operated Crane**

**Rental Crane**

<i>Item</i>	<i>Rate</i>	<i>Hours</i>	<i>Cost</i>
Travel time	\$ 145.00	6	\$ 870.00
On-site Time	\$ 105.00	34	\$ 3,570.00
Total Cost per week		40	\$ 4,440.00

Assume 2 weeks per job  
**Assume 12 jobs per year**                      **\$ 4,440.00**                      **24**                      **\$ 106,560.00**

**Self-Owned & Operated**

<i>Item</i>	<i>Rate</i>	<i>Hours</i>	<i>Cost</i>
Operator	\$ 14.00	40	\$ 560.00
Labor Burden	23.00%		\$ 128.80
Maintenance	\$ 5.00	40	\$ 200.00
Fuel, Oil & Grease	\$ 20.00	40	\$ 800.00
Annual Depreciation (hourly)	\$ 15.00	40	\$ 600.00
Travel	\$ 25.00	6	\$ 150.00
Total Cost per week		40	\$ 2,438.80

Assume 2 weeks per job  
**Assume 12 jobs per year**                      **\$ 2,438.80**                      **24**                      **\$ 58,531.20**

**Average Annual Cost for Rental vs. Self-Owned**                      **\$ 48,028.80**

3. *Do you rent cranes or derricks from others? Do you provide your own operators or rent the crane with an operator? How many time a year do you rent a crane or derrick from others?*

Not presently, but we may start renting soon

4. *How many crane operators do you employ? What is the annual turnover in crane operators?*

We have one crane operator and no turnover.

5. *Please review and provide comments on the specific unit estimates used by OSHA to determine costs and impact associated with the draft proposed standard, as summarized in Table 7. Note that costs are calculated only for the proposed requirements not already required by the existing standard.*

The PRIFA is meant to be a resource to small entity representatives to determine the economic impact that the draft proposed standard will have on small businesses. Unfortunately, the document is flawed in that the underlying data is not sourced in many of the areas and citing the "Office of Regulatory Analysis" is not a sufficient source for me to understand or evaluate the nature or consistency of the data.

OSHA compares the results from different studies, covering different years (OSHA reviewed accident abstracts from the Integrated Management Information System Database from 1995 to 2005, a separate analysis of construction fatalities involving cranes from 1997 to 1999, and a study of crane and rigging fatalities in Ontario, Canada, (the Crane Report NewsFlash, 1993)) which is typical for common research. However, the studies must be comparable and if not, the differences should be explained. It is not clear if OSHA's conclusions are accurate since it is not clear whether the two studies are comparable.

The wage figures that OSHA has quoted in the PIRFA are not sourced and I cannot possibly verify these figures. The overall cost analysis of the PIRFA is incomplete; the tables do not represent a true cost to an employer.

Many of the calculations do not factor the full wage and compensation or loss of production for complying with the proposed standard. There is no allowance for unforeseen delays and costs. It also does not take into account the cost of delays to our jobs as we shut down the main component of our production for compliance with the draft proposed standard.

Overall, the PIRFA would greatly benefit from more informative sourcing. Much of the data cited wasn't obtainable for verification. Calculations of the data and averages didn't always make sense and footnotes or notations would have been helpful.

## J. Alternatives

1. *Pages 32 to 35 of the Preliminary Initial Regulatory Flexibility Analysis (PIRFA) describes several alternative to the draft proposed standard that were considered by OSHA and the Cranes and Derricks Negotiated Rulemaking Advisory Committee (C-DAC). These pages also contain C-DAC's and OSHA's rationale for not adopting the alternatives. We would appreciate your ideas on these and*

*any other alternative you believe OSHA should consider. While the Panel actively encourages you to think about a full range of alternatives to the draft proposal, please bear in mind that any alternative selected must fully protect employee safety.*

There are several reasonable alternatives available for certification and qualification of crane operators while keeping employees safe and protected on the job. There are a few training programs that could easily be adapted and utilized without the incorporation of the required accrediting by a nationally recognized accrediting agency.

Crane operator certification programs should meet some "performance standard" within the OSHA standard that defines minimum criteria and knowledge needed, which OSHA has defined the minimum knowledge and skills needed in Section 1427 "Operator qualification and certification," paragraph J "Certification Criteria." OSHA needs to delete Section 1427a-e, which would allow for the flexibility that a small business would need to comply with the standard, while keeping safety a priority on the site.

Many general contractors have excellent crane training and qualification programs that are specific for their company and jobsites. A "one size fits all" national certification program that distinguishes between lattice boom and hydraulic, crawler and rubber tired, and above and below 17.5 tons is not adequate in determining the competencies of operators when operating a specific crane for a specific job. Additional training and qualification will have to be completed even if an operator already obtained NCCCO certification. Using an existing third party institution of higher learning such as the USDA Cooperative Extension Service, U.S. Army Corps of Engineers (USACE), TEEEX or city, county or state certification programs could prove to be an adequate option.

NCCCO will make accommodations for English speaking person who cannot read by providing them with a "reader" who will verbally read each question and answer. Yet, they will not provide a written test to persons for whom English is not their native language nor provide a translator. If safety is the goal, then why will they provide a "reader" to persons who cannot read yet will not provide materials in various languages or translators? Many contractors provide crane operator manuals and load charts in the native language of their operators. Individuals who are non-English speaking should also have the right to reasonable accommodations.

Currently under the draft proposed standard, a small crane operator is required to meet the same certification requirements as an operator of a several hundred ton crane. Certification requirements should be graduated based on load capacity. Although drug testing was ignored, my experience with drug abuse in construction is showing an increase. This increase has amplified the importance of enforcement for a drug testing requirement for certified operators. To

eliminate this aspect of the certification process is to negate the balance for any reason to even modify the existing crane standards. I deeply believe in these particular issues and seriously question any attempt to leave out a drug testing requirement.

OSHA has also left out requirements to meet minimum physical requirements. Physical exams are a necessity in this particular field. Determination of vision, hearing, and potential for seizures, epilepsy, emotional instability, high blood pressure and other physical impairments should be a part of the requirements for safe crane operations.

Another alternative is that OSHA requires the construction industry employers to follow physical examination and controlled substance and alcohol testing guidelines similar to the guidelines that the U.S. Department of Transportation (DOT) already requires for the transportation industry.

OSHA could also "grandfather" certain portions of the standard. In reference to crane operator certification and qualification, operators who have a certain number of years of experience and a certain amount of training could be "grandfathered" in the draft proposed standard.

2. *Are there difference in small business practice such that small businesses could be exempted from any portion of the draft proposed standard without the loss of worker protection (please explain your answer)?*

Perhaps in reference to the accrediting process, small business entities could prove that their safety and training requirements for crane operators are ample for the job site and work that they perform and could be exempt from requiring their crane operators be certified by an accrediting organization.

## **K. Documentation**

1. *The OSHA draft proposed standard contains recordkeeping requirements including documenting certain inspections, deficiencies in audited employer qualification programs (1427), signal person qualifications (1428), post-assembly testing of new or reinstalled derricks (1436), and part replacement orders relative to operational aids (1416).*
  - a. *What kinds of recordkeeping does your company already perform? For example, does your company keep records of inspections?*
  - b. *Do you feel that documentation should be required for some additional requirements in the draft proposed standard?*
  - c. *Are the recordkeeping requirements in the draft proposed standard clear?*
  - d. *Do you feel that any of these documentation requirements are unnecessary (please explain your answer)?*

Once again, I appreciate this opportunity to work with you to examine the cost associated with this draft proposed standards and its affect on small business owners. I would like to emphasize that this draft proposed standard for cranes and derricks in construction addresses many important issues and problems within the construction industry, however, does not properly answer many of these problems with realistic alternatives or solutions. Please feel free to contact me with any questions or use me as a resource.

Thank you,

Jerry Anderson,  
Anderson Construction Company

**Art Daniel**  
**Daniel Construction Service, Inc.**

Please consider this email an addendum to my previously submitted comments.

It has come to my attention that OSHA seems to be putting heavy weight on industry reaching a consensus in favor of operator certification, and that this is continuing through the SBREFA process. If that is true, there seems to be little value in the SBREFA process.

Further there did not seem to be a consensus of agreement among small businesses in the two conference calls.

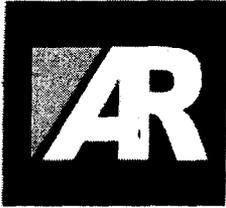
I am assuming that this emphasis on consensus (if it does exist) comes from the C-DAC negotiated rule making process. My I remind OSHA that there were two negative employer votes against operator certification, votes cast by C-DAC members who were speaking for the organizations that nominated them. A third C-DAC member asked that the record read that his nominating organization wanted him to vote against certification but he personally favored it. His vote was counted in the positive. Although there may be some argument about how his vote was counted there is no doubt that there was not industry consensus on the issue. There may have been consensus as defined by the C-DAC agreement but with two major organizations voting no and a third asking their representative to vote no, there clearly was not consensus. In my opinion the negotiated rule making process has been seriously harmed by the handling of this instance.

It was clear during the C-DAC process and even through the SBREFA conference call process, that the crane rental services, the crane and rigging companies, and the steel erection companies supported certification as called for in Option 1, while the other contractors supported an employer's ability (and responsibility) to train and qualify his operators. There was not industry consensus.

Thank you again for this opportunity.

A handwritten signature in black ink, appearing to read "Art Daniel". The signature is stylized and cursive, with a large initial "A" and "D".

Art Daniel  
President  
AR Daniel Construction Services, Inc.  
469-261-6526



**DANIEL CONSTRUCTION  
SERVICES INC.**

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September 7, 2006

Mr. Robert Burt  
Chair, Small Business Advocacy Review Panel  
U.S. Department of Labor  
Occupational Safety and Health Administration  
Washington, D.C. 20210

RE: SBREFA Review of OSHA Crane and Derrick Standards

Dear Mr. Burt:

Thank you for appointing me as a Small Entity Representative and allowing me to make comments on OSHA's proposed Crane and Derrick Standards. Throughout my career I have strived to ensure the safety of the workers under my employ or supervision. Now, as a small business owner, I find the weight of the responsibility of the safety of our work force more directly upon my shoulders and my belief in worker safety has only increased. However, I realize that regulations and rules, such as the proposed standard, will impact small businesses such as mine and perhaps the goal of increasing worker safety may not be reached or could be reached through another path without negative impacts upon small businesses.

After observing the negotiated rules making process by which the proposed standards were drafted and now reviewing the proposed standards again as a SER, I believe there are many changes in the standards that will promote increased worker safety. However, I am of the strong opinion that there are many new requirements that provide little improved safety for the worker but will have large negative economic impact on small businesses. Through these written comments I will attempt to identify such impacts and provide alternative methods by which to provide increased worker safety.

200 Bryan Place · Cedar Hill · TX · 75104 · 972.291.3304 · 972.291.4475 fax

Mr. Robert Burt  
Art Daniel  
Proposed CDAC Standards

As a Small Entity Representative, your office provided me with a list entitled "Issues the Panel Would like You to Consider". For simplicity I will use this list as an outline to direct my responses. There have been numerous issues brought up by myself and other SERs which have been added to the list and I will address these issues in their respective areas.

Again, thank you for the opportunity to submit these comments and receiving the viewpoints of a small business owner.

Sincerely,

A handwritten signature in black ink, appearing to read "Art Daniel". The signature is stylized with large, sweeping loops and a prominent initial "A".

Art Daniel  
President  
AR Daniel Construction Services, Inc.

Mr. Robert Burt  
Art Daniel  
Proposed CDAC Standards

### EXECUTIVE SUMMARY

The six points listed below summarize my comments that follow:

- OSHA has underestimated the total employers covered by this proposed standard.
- OSHA has underestimated the wages currently paid to crane operators.
- OSHA has underestimated the cost of certification. Our estimated cost of certification per operator when considering all factors of critical importance to a small business is \$267,450.00.
- OSHA has potentially denied a path to the highest wage scale on highway heavy/municipal utility crews to non English speaking employees.
- OSHA has grossly underestimated the record keeping requirements.
- The certification requirement will cause wage escalation, or "price wars" according to one California SER.

Each of these issues as well as others are discussed in detail in the pages that follow. Where possible I have provided the SBREFA panel with spreadsheets as appendixes. I have also provided source information as much as possible.

## ISSUES

### A. General

1. *Could changes be made to make the draft proposed standard easier to understand? Are there any specific types of information that OSHA could provide to help employers in this regard?*

The draft proposal is not difficult to understand, however it is too voluminous for many small businesses to fully examine and incorporate into their safe work practices. The proposed standard contains 42 sections<sup>1</sup> and is one hundred nineteen (119) single spaced pages long<sup>2</sup>. The current standard contains seven sections<sup>3</sup> and is eighteen (18) single spaced pages long<sup>4</sup>. This increased length does not necessarily increase worker safety while it does increase the cost of compliance to the employer. Reviewing the proposed standard I find few truly new issues addressed. The expanded number of sections results from expanding the written description of many of the same items addressed in the current standard, which while not only fail to increase worker safety, may actual cause confusion creating unsafe work conditions. Section 1423 Fall Protection in the proposed standards is adequately addressed in 1926.550 (a) (13) (i-iii) and 1925.550 (c) (2) in the existing standards. While offering little or no increased worker safety, the proposed standard is three and one-half pages long<sup>5</sup>, up from four paragraphs. As I will address in following pages there will be a dramatic increase in the record keeping for the proposed standard.

A standard mantra in compliance circles is "if it is not documented, it did not happen". I have seen this mantra in action in every visit from an OSHA compliance officer I have had in my career. Phrases such as "employer must determine", "employer must demonstrate", "employer shall train", "supervisor must determine", etc. require that the employer take steps to document that such actions took place. While there are additional phrases that specifically state documentation requirements, the phrases above are hidden documentation requirements. In many cases there are actually multiple documentation requirements in the same phrase. For example "shall be inspected by a qualified person", the employer must document both the inspection and why the person conducting the required inspection is a "qualified person". The proposed standard

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has one hundred and fifty four (154) instances that either are direct documentation mandates or are of the hidden variety<sup>6</sup>. In comparison the current standards have fourteen (14) direct documentation mandates or hidden documentation issues<sup>7</sup>. I will address the cost of such documentation in latter paragraphs in discussing Issue K. Documentation.

*2. Does the proposed standard include provisions for which compliance may be difficult, which could be improved while maintaining employee protection.*

Yes, there are numerous issues in the proposed standard for which compliance will be difficult and for which there are alternative means to ensure worker safety in these areas. Perhaps the issue where achieving compliance will be the most difficult is crane operator certification. In our geographic area of operations, Texas, the language barrier alone will make compliance with the proposed standard difficult.

The construction workforce in Texas is ninety percent (90%) Hispanic, many of whom are English as a Second Language (ESL) employees. These employees are represented in all crafts and all skill levels. With increasing skills, wages also increase accordingly. On many of the public works jobs where we perform our work, a minimum wage is established for respective crafts and we must submit certified payrolls showing the employee's social security number, wage, and hours paid. Although highly skilled as a crane operator, many of these employees will not be able to pass the certification test as now proposed.

It is well documented that when reading in languages other than the reader's first language, the reader must first translate to their first language. Accordingly an ESL Spanish as a first language crane operator must first take the time to translate test questions into Spanish from the written English. On tests such as NCCCO crane certification test, sufficient time may not given for the ESL test taker.

The importance of addressing the Spanish language barrier is demonstrated in OSHA's own web site. On the web site, OSHA has made available to both employer and worker much if not all of the tools for worker safety in Spanish, although previously available only in English. The entire

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web site is also available in Spanish. For the proposed standard to not address this very obvious practical factor in the construction industry, a growing factor across the country, is a major failure to the employer, the worker, and the public.

When addressing the language issue in Texas and a growing number of other states, proponents of the certification requirements state that allowing a non-English speaking employee to operate a crane is in violation of today's standard. They reference ANSI B30.5 stating that ANSI requires the operator to read the manufacturers operations manual. ANSI B30.5-3.1.2 (b) (3) states:

“(3) operators shall demonstrate their ability to read, write, comprehend, and exhibit arithmetic skills and load/capacity chart usage, in the language of the crane manufacturer's operation and maintenance instruction materials.”<sup>8</sup>

Note that this standard refers to load/capacity chart usage not the entire manual. Also the ability to read, comprehend, calculate, and use a load chart is a far different skill than taking a timed test.

Although the proposed standard requires certification or qualification through four options, for our business there is only one option, Option 1. Option 3 (although incorrectly numbered Option 4 in the C-DAC consensus document) of qualification by the US Military is not an option for our firm as less than one percent (1%) of our contracts are military contract. Option 4 (numbered Option 5 in the C-DAC consensus document) of Licensing by a government entity is not an option in our geographical area of operations there are no governmental entities that license crane operators.

Option 2 (numbered Option 3 in the C-DAC Consensus document) is not an option for our firm as a small business. Our firm has 27 employees including corporate officers. The corporate officers also serve as supervisors, safety officers, sales staff, administrative staff, finance staff, and clerical staff. With the current responsibilities the corporate officers could not develop in a cost effective manner a qualification program that meets the standards as now proposed. The biggest hurdle to developing such a program is the requirement for development by an accredited crane/derrick operator testing organization or for the employer's program to be audited by such

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and organization. OSHA is well aware that although the standard does not name a particular organization, there was only one such organization at the time the proposed standard was drafted, that is available for an employer to turn to (since August 5, 2004 a local union in southern California has been accredited). This single source limitation creates an unworkable option. Additionally, the language barrier referred to above impacts the probability to get accreditation and have non-English speaking or ESL employees to pass the written English test.

The only remaining option is Option 1, certification by an accredited crane/derrick testing organization. Again, the language barrier existing in our geographical area will prevent many of our employees (or the available workforce) from passing the written certification test.

Not only will compliance with this portion of the proposed standard be difficult, any small degree of compliance that may be achieved will be at an extremely high economic costs. I will discuss these costs further in issues addressed in "Section G. Operator Certification/Qualification."

Further, whatever degree of compliance that is achieved, it will come at the cost of the years of experience possessed by qualified Hispanic operators. Such a loss could very well put workers at jeopardy as more inexperienced crane operators who could pass a written certification test will be operating cranes. In discussing his state's certification regulation, Kerwin Chong Vice President and CEO of Hawaiian Crane and Rigging said "it takes 10 to 15 years of experience before a driver can operate a 100-ton crane."<sup>9</sup>

Although I cannot quantify the potential cost to my business, I believe this proposed standard puts my business at risk of violating numerous Equal Employment Opportunity and other civil rights regulations or equally as bad from an economic stand point, being accused of violating them. Many government contracting agencies investigate any complaint against a contractor and some even bar a contractor from bidding contracts until the investigation is complete.

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Should I deny a Hispanic operator the continuation of the job he has performed in an excellent manner for a number of years only because he cannot read English well enough to pass a certification exam, that operator may file a complaint against my firm with an awarding agency. If that agency opens an investigation it will cost me time and dollars to defend myself solely because I followed an OSHA standard. Although I have not discriminated against anyone, I will have to spend real dollars to defend myself and may potentially lose the opportunity to bid on contracts with that agency until I am cleared of all accusations. That is a real cost that OSHA should have considered in the PIRFA.

*3) Would any of the proposed requirements cause you to significantly change the way you or others in your industry do things, and what effect would such changes have in terms of time, money, and safety? Please explain and support your conclusions with specific information or examples, if possible.*

I will further address the ground conditions issue below but the proposed standard Section 1402 on Ground Conditions could cause a change in the manner in which we do business. As most of our work is as a sub-contractor, the proposed requirements regarding ground conditions could cause a change in our contractual negotiations with the general contractors we sub-contract from. In such cases we are probably not the controlling contractor that can effect an improvement in the ground conditions. If adopted as proposed we will most likely consider changing our scope of work so as not to include improving poor ground conditions effecting crane stability.

Again, the crane operator certification/qualification issue will have the greatest change in the manner in which we or others in our industry do business. If adopted as proposed, as I have detailed above we have only Option 1 as a means to qualify or certify our operators, an option that will most likely be unsuccessful. Without certified operators we will be forced to find alternative methods of meeting our lifting needs.

One possible alternative method of lifting would be to utilize an excavator rather than a crane as excavators are exempt from the proposed C-DAC standards. This will have a dramatic impact on

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our costs. On projects where we would typically use a 30 ton rough terrain crane, a 78,000 lb. class excavator would be used to replace the crane. Such a switch of equipment would result in a monthly increase of \$8,608.60 in equipment rental more than triple our cost each month<sup>10</sup> for each crane used. Total monthly impact for our company would be \$25,825.80.

OSHA has expressed in the PIRFA the opinion that compliance costs are generally passed onto the customer as part of the construction costs<sup>11</sup>. This is not always true. Many of our contracts are fixed priced long term public works projects that have no escalation clauses for such increased costs as compliance costs. Furthermore in the low bid world of public works contracting the full impact of compliance costs may take years to be passed on to the customer.

This inability to pass on the increased cost means that the small business must absorb the cost. To absorb this cost we will either have to cut profits, decrease costs – most likely through staff reductions – options that will have a major negative impact on both our business health and the health and safety of the work force.

### B. Ground Conditions

*1. Who typically takes care of correcting insufficient ground conditions? When ground conditions are unsuitable for setting up a crane, do you have problems getting them corrected?*

Making the controlling contractor responsible for ground conditions is not a complete solution. All parties involved in and with expertise in the lift should be involved in recognizing insufficient ground conditions. Who is responsible for correcting the conditions should be a contractual matter between the private parties to the contract, not the government through an OSHA standard. If I am the employer supplying the crane and the operator – be I a contractor or a crane rental service – it is my firm's responsibility to recognize and report the deficiency to the contractually responsible contractor. Should the contractually responsible contractor fail to correct the insufficient ground conditions then it is my responsibility to the safety of my workers and the project to remove my crane and operator from the project site.

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Our firm has faced similar situations in excavation safety. If the controlling contractor is furnishing an excavation for our employees to work and they fail to provide a safe trench, then I must either convince the controlling contractor to take the required steps or leave the project site. We have faced this decision on numerous occasions in excavation safety and have forfeited that income rather than place our work force in an unsafe situation. Small business may face the same decisions when furnishing cranes and operators.

*2. OSHA estimates that the new regulation would add 30 minutes of a supervisor's time to assure adequate site assessment. How much time do you spend on site assessment now and who is responsible for it?*

It is doubtful that 30 minutes may be sufficient for the supervisor's time to assess the site conditions and more than the supervisor should be involved in the assessment. I believe that a thorough assessment would take one hour or more. In addition to the assembly/disassembly supervisor, the crane operator, the project superintendent, the project manager, and the safety director should all be involved in the assessment. Should the assessment occur after the crane has been mobilized to the site additional forces and equipment will be involved. A more accurate estimate of the cost would range from \$447.74 to \$1,170.00 should the crane already be on site<sup>12</sup>.

### C. Assembly/Disassembly

1. Who normally supervises the assembly/disassembly process?

As we own no cranes I am answering this question from the standpoint of when we rent cranes that require assembly/disassembly. On these occasions we rely heavily on the supplier of the crane. The assembly/disassembly process is normally supervised by the project superintendent in conjunction with the assembly/disassembly mechanic.

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*2. Do you always follow the manufacturer's instructions for assembly/disassembly?*

Yes.

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D. Power Line Safety

*1. In how many jobs does your company work closer than 20 feet to power lines? How many days of the job typically involve working closer than 20 feet to power lines? How many jobs does your company do that require working within 10 feet of a power line? How many days of the job typically require working within 10 feet of a power line?*

As much of our company's work is along highway or street right of ways, as high as 50% of our jobs could be closer than 20 feet of power lines. A typical job could require we work within 20 feet of a power line for 20 days. Less than 25% of our jobs require us to work within 10 feet of power lines. For these jobs the days that we are working within 10 feet of power lines average 2 days.

*2. What precautions does your company take to ensure that the minimum allowable clearance from a power line is maintained? Does your company follow the power line safety requirements set forth in the current ANSI Standard.*

When our projects involve working closer than 20 feet of power lines, each day begins with a safety briefing of the entire crew emphasizing the safety rules. We include in these meetings the minimum distance standards, handling a load when near power lines, and emergency procedures. The ANSI standards are minimum standards for our personnel. Additionally we will choose not to accept work near power lines when working near the power lines is not absolutely necessary. As a boring and tunneling contractor for underground utilities we frequently see design engineers place our work closer to power lines than 20 feet, 10 feet, and sometimes even under power lines. If the project design provides no alternative work area than near or under power lines, we will choose not to bid the project. However, someone is bidding and building them in those scenarios.

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3. *If your company works closer than 10 feet to power lines, what precautions does your company take to ensure employee safety.*

When we do work closer than 10 feet to power lines we hold a project meeting with all employees to review the related safety rules before beginning work on the project. As stated above when working closer than 20 feet we will have daily safety meetings that deal solely with the topic of working near the power lines. We will also establish "no swing" zones, marking the boundaries of these zones with safety fencing and signs. A spotter is always assigned to stay in communication with the operator to keep the crane boom out of the swing zone.

4. *When working in the vicinity of power lines, what other precautions does your company take to ensure employee safety.*

See above

5. *OSHA's estimates of the costs of various power line safety measures are given on pages 25 to 28 of PIRFA. Can you improve on these estimates?*

It is my opinion that throughout the PIRFA OSHA's cost estimates are too low. Many times OSHA omits, necessary travel time, support equipment, or the wage is established too low. The wages shown in Table 7 are not sourced so it is not possible to make comparisons with our geographical area. Nor is it explained what the wage includes. Does the wage include only the raw wage? Or does it include any or all of the following: overtime, tax burden, insurance burden, employer provided benefits. Based on our payroll costs and the local wage rates OSHA has underestimated the wages by twenty percent (20%) to one hundred and fifty seven (157%)<sup>13</sup>. Also missing from OSHA's cost estimates is the time spent waiting for a power company owner/operator to provide the employer with information on the line or to inform the employer of the line's energized status.

Using the wages developed by OSHA and shown in Table 7 a thirty minute meeting including the supervisor, rigger, spotter, operator, and four employees would cost \$83.49. Using our actual local wage rate and including every piece of equipment and support equipment the actual cost would be \$277.15. In this example OSHA's cost estimate is less than one third of the actual cost to hold such a meeting<sup>14</sup>.

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Furthermore from research I have conducted, OSHA's estimated annualized cost of \$429 for an insulating link is understated. The costs of these insulating links range from \$1500 to \$15000 depending on the size of the machine.

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Art Daniel  
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E. Inspections

*1. The draft proposed standard would require inspections at specific intervals (shift, monthly, and annual), and following certain activities (equipment modification, repair/adjustment, severe service, equipment not in regular use). To what extent is your company already performing similar inspections? What inspections do you currently perform?*

At the current time we do not own any cranes and our rental needs are less than one year typically, so we do not perform annual inspections. Previously, I have relied upon outside inspectors to perform annual inspections at a cost of \$500 per crane. When renting a crane we ask for the date of the last annual inspection from the crane owner. While using a crane we perform daily checks of key elements, and monthly inspections if in possession of the crane for that length of time.

*2. Do you follow the current ANSI standard for inspection frequency?*

ANSI's current standard is frequent, periodic, and annual. We do follow this standard or verify that the crane owner has if it is a rented crane.

*3. The proposed standard lists items that must be included in each type of inspection. To what extent is your company already inspecting these items.*

We are inspecting 60-95% of the items, depending on the inspection interval.

*4. Who currently conducts your inspections and how, if at all, would the draft standard affect your current practices?*

Our operator conducts frequent inspections in addition to the daily checks of key items. Other personnel (supervisor and officers of the company) perform frequent spot checks of key elements. Monthly inspections are conducted by key company personnel. Our costs would increase if any of these personnel would not be considered the competent person.

*5. Are the corrective action provisions in the draft proposed standard clear enough to be understood and implemented?*

No. To be clear the provisions should be in a spreadsheet format showing what needs to be inspected and at what interval the inspection needs to be done. While an employer may develop such a spreadsheet themselves, as a small business such a development will be delayed by issues that seem more pressing in the daily operations of a company.

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6. *Does your company keep records of inspections? What would you need to do differently to achieve compliance with the requirements in the draft proposed standard?*

Records for the frequent inspections by the operator are not kept except as noted on the daily work record that no repairs are needed. Monthly inspection records are also kept on the daily work record. We do not obtain copies of the annual inspections for the cranes we rent. Adoption of the proposed standard will require dramatic record keeping changes in the area of inspections alone. We will most likely develop a monthly inspection form and keep those on file (perhaps requiring additional office staff when all the new documentation potentials are considered). We will also have to obtain and keep on file copies of annual inspections from the crane owners when we rent a crane.

Obtaining these inspections (both annual and monthly) will include occasions when we hire a crane rental service for four (4) to eight (8) hours.

7. *OSHA assumed that daily visual inspections of the crane were standard practice, and took no costs for this inspection requirement. For monthly and annual inspections, and inspections following repairs, OSHA estimated that an additional 15 minutes would be required to meet the new requirements for each of these types of inspections. Could these estimates be improved?*

The current standard requires inspection prior to each use and during use by a competent person to make sure "it is in safe operating condition"<sup>15</sup>. The current standard does this in about forty five (45) words. The proposed standard is one and a third pages long. There is a gulf of difference between the current standard and the proposed standard and it is not realistic to assume no additional time, therefore costs, for the daily inspection requirement.

No inspection takes only 15 minutes. OSHA has severely underestimated the time needed for the monthly and annual inspections. No inspector can walk around, climb on top of, and access all areas necessary to fulfill the monthly inspection in 15 minutes, much less perform the inspection.

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F. Fall Protection

1. *What fall protection measures does your company currently use to ensure employee safety when on the walking/working surfaces of a crane? Does your company require the use of fall protection equipment? If so, when?*

We do not use fall protection equipment. However, we do train our employees to only use the areas of the crane that were designed for them to walk upon and we keep those areas free from oils or other slick substances.

2 *The draft proposed standard contains requirements relative to steps, handholds, grabrails, railings, and slip-resistant surfaces. To what extent is your crane already equipped with any of these fall protection aids?*

- *Are these devices manufacturer installed?*
- *Where are these aids located on the crane (e.g. cab access/egress)?*

Since we do not own any cranes at this time, the question is not applicable to our firm.

3. *DO you have cranes equipped with a boom walkway? If so:*

- *Which types of crane have them, and*
- *Approximately when were they manufactured?*

No.

G. Operator Certification/Qualification

*1. How does your company assess whether an operator is competent to operate a particular crane/derrick? Do you have your own assessment procedure, or do you have the operators certified by a testing organization?*

Our company policy is that before an operator can climb into the cab he/she must be trained, qualified, and authorized. We use an outside training agency to train and to qualify our operators. We augment this training with our own in house training, re-training, and reinforcement of training items. Further we authorize only those who have received training and qualification to operate a crane. The training our employees undergo is specifically developed with for type of cranes we use. We never use tower cranes so we have no tower crane training or qualification. We seldom use greater than 100 ton crawler cranes so we do not train for that type of crane. Our employees most frequently operate 30 to 40 ton hydraulic rough terrain cranes and are trained for and on those types of cranes.

*2. How many crane/derrick operators do you employ each year?*

6.

*3. In its preliminary cost estimates, OSHA estimated that certifying a crane operator would require 2 days of a crane operator's time, plus \$500 per operator for training costs, and \$250 for the test itself. This estimate includes time for review and test preparation, as well as the time required to take the test. Could this estimate be improved?*

Yes, the estimate can be improved. As I stated previously, OSHA has severely underestimated the costs of the proposed standards and no where is that more clear than in the issue of crane operator certification. The PIRFA estimate to obtain certification is \$1,251.00. Discussing the certification requirement in Hawaii, the Pacific Business News reported that the cost to certify one operator could be up to \$5,000.00.<sup>16</sup>

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Based upon information from NCCCO trainers and examiners, using our local wage rates and geographical area of operations we have estimated the cost to be a minimum of \$6,151.59<sup>17</sup>. For the six operators we employ we would face a total cost of \$36,909.54.

Also, OSHA has not included any costs for retesting. A major national highway contractor has been attempting to gain certification of his crane operators in our geographical area of operations through NCCCO. Even though some of this contractor's key personnel have served as NCCCO Commissioners, the passing rate of their employees is only 60%. Discussing the experience in Hawaii, the Pacific Standard News reported that "few operators pass the national qualification test at first go."<sup>18</sup> This experience shows that retesting will be a major cost and should be considered by OSHA.

Applying the sixty percent (60%) passing rate to the six operators we employ an additional expenditure of \$14,763.82 for retesting expenses. Again, this is a cost that OSHA has not considered in the PIRFA. OSHA did not calculate the costs of recertification in the PIRFA.

Furthermore OSHA has not taken into consideration the loss of production and related income while the operator is taking the class and obtaining certification. To complete the training and testing the operator would be out of the work force for up to 9 days. For our typical work this would mean a loss of \$86,040 in lost income<sup>19</sup>.

In addition to the lost income from the loss of production while the operator is out taking classes to prepare for the test and taking the tests, we fall behind schedule perhaps subjecting us to liquidated damages. We will spend additional money in overtime wages to avoid liquidated damages or other penalties. Again, these are costs not included in the PIRFA.

The above cost of \$6,151.59 per operator does not include record keeping costs which OSHA has grossly underestimated to take only 2 minutes. Such record keeping would require at a minimum

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15 minutes. For many small businesses, including ours, there is no clerical staff for such record keeping.

Neither has OSHA included any costs for test taking skills tutoring, literacy reinforcement or English training for ESL employees. As I stated above in the General Issues questions, to ignore these factors that are present in the work force is a failure to provide for worker safety, employer accountability, and the safety of the public.

Training a well qualified and experienced crane operator for who English is not their first language, to read and comprehend English well enough to take a timed certification test is extremely expensive. The University of Texas at Arlington's English Language Institute offers an intensive program for instructing an ESL student to read and comprehend English. The program consists of six Levels, each level requires 20 hours per week at 16 weeks. To reach the proficiency level estimated to be required to pass a certification test a Level 5 would be required. Including a replacement operator, the estimated cost to obtain Level 5 proficiency would be \$139,170.00<sup>20</sup>.

Our firm has investigated the development of a specialized ESL program directed at crane operator certification. The developmental costs of such a program alone are \$38,000.00.<sup>21</sup> For the six operators in our company that is \$6,333.33 per operator. These developmental costs do not include the operator wages, instruction fees, or other costs. Including these costs the total cost is \$130,123.80 for six operators<sup>22</sup>.

Including tutoring for English proficiency to a level high enough to take a timed test the total cost per operator is estimated to be \$267,450 per operator<sup>23</sup>. The total cost for all six operators will be \$329,940.00 when amortized over the five year certification period. At the end of the five year period we must retest to retain the certification. If we retain all the original operators we can be optimistic that the cost will decrease.

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H. Signal Person Qualification

*1. Do you have problems with signal persons not knowing how to give or understand signals, or not sufficiently knowing about crane operations? Do most signal persons have a basic understanding of crane operation, including the dynamics involved in swinging and stopping loads?*

No, I do not have problems with signal persons. The most common problem I observe is untrained employees attempting to give signals while the trained signal person is also giving signals.

*2. Do you currently train and test signal persons?*

We constantly reinforce signal training among our signal persons. We test to the extent we ask the signal person to demonstrate certain signals. No written tests are given.

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I. Costs and Economics

*1. How many jobs do you do in the typical year that require cranes or derricks? On average, how long is the crane or derrick on site?*

We typically have 24 jobs per year that require cranes or derricks. The crane/derrick is on site typically six weeks.

*2. How many cranes or derricks do you own? Do you rent these cranes and derricks?*

None at present.

*3. Do you rent cranes or derricks from others? DO you provide your own operators or rent the crane with an operator? How many times per year do you rent a crane or derrick from others?*

Yes, we are presently renting all the cranes we use from others. We typically provide our own operators. Occasionally we will need a larger crane than we have on site for less than a day to facilitate a particular lift. For these instances we will rent a crane with an operator, typically on an hourly basis.

*4. How many crane operators do you employ? What is the annual turnover in crane operators?*

We currently employ six crane operators. We typically do not have any turnover.

*5. Please review and provide comments on the specific unit estimates used by OSHA to determine the costs and impacts associated with the draft proposed standard, as summarized in Table 7. Note costs are calculated only for the proposed requirements not already required by the existing standard.*

Comments on costs summarized in Table 7 are embedded in my comments above.

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Additional Issues

Drug testing and physicals

Based upon C-DAC's inclusion of the operator certification provisions the operator must be a key to worker safety. If the operator is key to safety, then why is drug testing of the operator not mandatory? Certification of an operator that sits in the operator seat high on drugs does not promote worker safety.

Likewise, the physical health of the operator should be a concern as a certified operator on the verge of a heart attack creates an unsafe job site. Failure to consider these fit for duty conditions subjects the work force to potentially unsafe conditions. These provisions should be in the standards not in any third party reference material.

Economic impact of wage escalation driven by operator certification

If the certified crane operator provision of the proposed standard is adopted there will be an escalation of crane operator wages. This is especially true in our geographical area of operations where the work force is dominated with non-English speaking crane operators that will not be able to achieve certification. The crane operators who do achieve certification will be able to demand higher wages. The escalation of wages does not stop with crane operators but will work through the entire work force.

In California following the initiation of mandatory third party certification wages increased approximately 15% according to the comments made by a California SER during the SBREFA Conference Call on August 29, 2006. This SER used the term "price wars" to describe the wage escalation that occurred in that state. We also have a historical event to examine how much wages may increase. In 1989 new US DOT regulations for commercial drivers licenses went into effect. The new CDL driver wage increased 10% and other wages increased a little over half that amount. The test required for the CDL was much simpler than the current crane operator

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certification test and is offered in multiple languages. This historical information supports at least a 15% wage increase.

Using these percentages for our small company and work force we estimate that for twenty seven employees the wage escalation could have an impact in excess of \$150,000 per year<sup>24</sup>.

Scope of certification (30 ton is same as 200 ton)

The proposed certification standard makes no difference for the type or size of crane operated. The one accredited testing agency offers three certification programs (mobile crane, tower crane, overhead crane) with specialization in four areas for mobile cranes. Our firm operates only mobile cranes and mobile cranes are the dominate crane in the highway and heavy construction industry. As I previously stated, we operate telescopic boom swing cab cranes less than 50 tons in capacity. According to the proposed standard an operator I have trained and assist obtain mobile crane certification through NCCCO is qualified to operate any swing cab telescopic boom mobile crane. Although the operator is well experienced in operating a 30 ton crane he has no experience or training in operating a 200 ton swing cab telescopic boom crane. These cranes range from 20 ton to 500 ton in daily use but exist as large as 1500 ton capacity. Despite this lack of experience a larger contractor may hire my employee to operate a much larger crane. . When this occurs I must either hire another operator with certification and potentially enter into a "price war" with other employers or hire a less experienced operator to train and assist in obtaining certification.

The proposed standard has aided in creating a potentially unsafe work environment through the certification standard. Adoption of a training and qualification standard as I suggest in "J. Alternatives" would not lead to contributing to an unsafe work environment as my training would be specifically the size cranes the operator would be operating. Certification as proposed is misleading in the implication the operator can operate any telescopic boom swing cab crane.

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J. Alternatives

**Section 1427 – Crane operator certification and qualification**

In the PIRFA report cites Ontario study on crane and rigging fatalities to provide evidence of the effects and benefits gained by comprehensive training and testing. I note that this does not refer to any certification. Certainly an absence of mandatory training would bring about unsafe work conditions but that is not what is being proposed and is not what is in existence in current OSHA standards, and certainly not in my goals and objectives.

Further comparing worker safety issues in Canada and United States is an apples and oranges comparison. Unlike in the United States employees in Canada are subject to fines for safety violations just as their employers are. The potential to be fined is no small incentive for an employee to follow the safety rules an employer has established and trained his employees to follow. We have no such incentive in the United States, and never will have, which makes comparison to Canadian statistics irrelevant.

Training is an absolute must to develop and maintain a safe work place. It is to my competitive advantage to train and create an atmosphere where employees strive to have a safe work environment. Reasonable and responsible testing is also within logical expectations. However, the certification standards proposed by C-DAC are neither reasonable nor responsible and do not necessarily lead to increased worker safety.

Notably absent from the PIRFA discussion is any data showing that no certified crane operator has had an accident since obtaining certification. It should be noted that there have been accidents involving cranes and operator error, when the operators were certified operators.

OSHA has established a precedent of making training the backbone of increasing worker safety. However the following can be discovered in a reading of the NCCCO web site:

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### Training Policy

Because of its third-party status as an independent provider of certification, the National Commission for the Certification of Crane Operators (CCO) is unable to offer training. Third-party providers of services are generally prohibited from offering any related service because of a potential conflict of interest in the outcome of the certification process.<sup>25</sup>

I am discussing NCCCO because that is really what certification is about. At the present time NCCCO is the only certification option available to most employers (see comments in General Issues concerning other certification/qualification options). NCCCO is not a training resource and will do nothing to increase training that will lead to increased worker safety. NCCCO is solely a test development and testing agency.

The PIRFA report states that an alternative was considered but rejected by C-DAC. With all due respect to the C-DAC members and the work and dedication they gave to the task but I doubt that serious consideration was given to any alternative but certification in the absence of the crane operator possessing a license from a governmental entity. After attending C-DAC meetings during discussion of this issue, I firmly believe for various reasons there was a pre-existing bias in favor of certification, and particularly a certification requirement written in favor of NCCCO.

I base my belief on the fact that many of the C-DAC members had a relationship with NCCCO prior to their C-DAC tenure. Five of the twenty one members had close relationships with or a number of the fellow employees or union members had close relationships with NCCCO<sup>26</sup>. While I do not believe that any of the C-DAC members used or would use their C-DAC membership status for personal financial gain, I do believe there existed a "pride of authorship" bias in favor of NCCCO as many of these individuals were instrumental in the establishment and development of NCCCO.

I believe that evidence of this bias is found within the C-DAC document itself. Section 1436 Paragraph (q) reads:

"Section 1427 (Operator qualification and certification) does not apply"<sup>27</sup>

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Returning to NCCCO's web site we find the following description of their certification programs:

#### **Certification Overview**

NCCCO currently administers certification programs for operators of mobile cranes, tower cranes and overhead cranes.

Notably absent from the certification programs offered by NCCCO is Derricks which we find exempted in the C-DAC section referenced above.

Why else would derricks be exempted? During the August 29, 2006 conference call it was explained that one reason for the exemption was the absence of a certification testing program. Derrick cranes are still used and lift the same or heavier loads than some mobile cranes, tower cranes, and overhead cranes.

As I have noted above there is little option but NCCCO. Attempting to fully measure the means to serve their membership, the AGC of Texas researched the possibility of establishing a certification agency to meet Option 1. The AGC of Texas issued RFPs for the development of an accredited testing program according to the proposed standard. The bids received were in excess of \$350,000.00 plus \$100,000.00 in annual maintenance costs.<sup>28</sup> With developmental costs that high there is little likelihood that alternatives to NCCCO will be developed.

If the establishment of a certification program would have lowered the cost to their membership while increasing worker safety the AGC of Texas most likely would have pursued that option. However, testing costs alone for one operator to take the certification exam would have been in excess of \$2,350.00<sup>29</sup>. This does not include any of the operator wages, travel time, nor training specifically for test preparation.

While I understand that many national employers desire certification so that they do not have to have a separate certification for every state in which they work. I also realize the value of my obtaining copies of operator certification papers for the operators of cranes I hire from a crane

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rental service. In this instance I do not know the individual operator, have not trained him, do not know the training or experience record of the operator, so the certification by an organization such as NCCCO is welcome. For these reasons perhaps Section 1427 could be re-written to include Options 1 (certification) and dropping the auditor requirement from Option 2.

To assure that employers train and qualify operators to minimum levels, standards should be published to guide the employer in developing a training program. In lieu of outside operators the employers could use the services of third parties. These could include commercial schools that meet certain established criteria and university affiliated training programs (such as TEEX) that have existing accreditations.

Another alternate to third party certification as proposed can be found within the current OSHA standards. OSHA recently issued new standards for training and qualifying operators of fork lifts (1910.178). I offer the panel the suggestion of the development of a similar training and qualification program for crane operators. Comparative examples of the fork lift standard and a comparative crane operator standard in Appendix G. The suggested wording for training and qualification of crane operators could be changed to more directly follow the wording found in the C-DAC consensus document Section 1427 Paragraph (j).

Following guidelines such as the fork lift operator precedent will not bring the extreme cost increases that certification by a third party as required by Option 1. By providing an employer with training guideline the costs of the training may actually be reduced.

More importantly, providing an employer with an extensive training guideline such as has been done in 1910.178 will increase worker safety. As one of the proponents of operator certification said during the August 29, 2006 conference call "certification does not mean the operator is a safe operator", the employer must continue to train, train, and train again to assure safety.

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2) Are there differences in small business practices such that small businesses could be exempt from any portion of the draft proposed standard without the loss of work protection (please explain your answer)?

As I have stated above the standards are too broad. What I need as a small construction firm operating cranes smaller than 50 tons is not what a large firm with 200 ton cranes in their fleet needs. These needs are in service, training, and operation. It requires a different class of operator to pick and set a 30 ton concrete bridge beam 60 feet above the ground on two square feet of area than it does to set a half ton dirt bucket on the ground in a twenty square feet of dump area. However, exempting small businesses is not the answer. The answer lies in the requirements of the standard for certification. Some small businesses would be better served with certification by a third party while others will be better served through employer training and qualification following OSHA established guidelines as I have proposed in Appendix G.

K. The OSHA draft proposed standard contains record-keeping requirements including documenting certain inspections, deficiencies in audited employer qualification programs (1427), signal person qualifications (1428), post-assembly testing of new or reinstalled derricks (1436), and part replacement orders relative to operational aids (1416).

- What kinds of recordkeeping does your company already perform? For example does you company keep records of inspections?

Yes, our company does keep record of inspections but as stated earlier they are on the daily work records of the project supervisor. We believe that should the standard be adopted as written we will need to add clerical staff at an estimated total cost of \$48,000.00 per year.

- Do you feel that documentation should be required for some additional requirements in the draft proposed standard?

No.

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- Are the record keeping requirements in the draft standard clear?

See comments above under "A. General Issue No. 1".

- Do you feel that any of these documentation requirements are unnecessary (please explain your answer)?

See comments above under "A. General Issue No. 1".

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**APPENDIX A**

**Cost to convert from 30 ton hydraulic rough terrain crane to hydraulic excavator**

MACHINE	HOURLY OPERATED COST	220 HOURS /MONTH
30 TON ROUGH TERRAIN CRANE	\$70.61	\$15,534.20
2.25 CY CRAWLER EXCAVATOR	\$109.74	\$24,142.80
ADDITIONAL COST FOR EXCAVATOR		\$8,608.60

Equipment Rates taken from Rental Rate Blue Book for construction equipment published by Equipment Watch.

**Rate Development**

MACHINE	PAGE	MONTHLY RATE	HOURLY RATE	RATE ADJUSTMENT FACTOR	LOCAL ADJUSTMENT FACTOR	OPERATING COST	HOURLY OPERATED COST
30 TON ROUGH TERRAIN CRANE	13-11	6,865	39.01	0.973	0.916	35.85	70.61
2.25 CY CRAWLER EXCAVATOR	10-23	11,630	66.08	0.982	0.906	50.95	109.74

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### Appendix B

#### COST TO TUTOR TO ENGLISH PROFICIENCY

Program Developmental costs	\$ 38,000.00
Operators	6
Developmental costs per operator	\$ 6,333.33
Course cost per operator	500
Hours per operator	96
Wage	\$ 37.51
Wages per operator	\$ 3,600.96
Replacement Operator Hours (6 weeks @ 50 hours week)	300
Replacemtn Operator Wage	\$ 37.51
Total Replacement Operator Wages	\$ 11,253.00
Total Cost to Tutor one operator	\$ 21,687.29
Cost to tutor six operators	\$ 130,123.76

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**APPENDIX C**

**GROUND CONDITIONS ASSESSMENT**

**ESTIMATED COST IF CRANE IS NOT ON SITE DURING GROUND CONDITIONS ASSESSMENT:**

ASSEMBLY/DISASSEMBLY ASSESS GROUND CONDITIONS	PIRFA ASSESSMENT	UNIT	ESTMIATED PIRFA UNIT COST	PIRFA EXTENSION	ESTIMATED ACTUAL QUANTITIES	ESTIMATED ACTUAL UNIT COST	ACT'UAL EXTENSION
ASSEMBLY/DISASSEMBLY SUPERVISOR	0.5	HOUR	36.22	18.11			
<b>ACTUAL COST</b>							
ASSEMBLY/DISASSEMBLY SUPERVISOR		HOUR			1.00	60	\$ 60.00
ASSEMBLY/DISASSEMBLY SUPERVISOR VEHICLE		HOUR			1.00	10	\$ 10.00
CRANE OPERATOR		HOUR			1.00	37.73	\$ 37.73
PROJECT SUPERINTENDENT		HOUR			1.00	110	\$110.00
PROJECT SUPERINTENDENT VEHICLE		HOUR			1.00	10	\$ 10.00
PROJECT MANAGER		HOUR			1.00	125	\$125.00
PROJECT MANAGER VEHICLE		HOUR			1.00	10	\$ 10.00
SAFETY DIRECTOR		HOUR			1.00	75	\$ 75.00
SAFETY DIRECTOR VEHICLE		HOUR			1.00	10	\$ 10.00
<b>ESTIMATED TOTAL COST</b>							<b>\$447.73</b>



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**APPENDIX D**

**WAGE RATES**

Employee Classification	UNIT	PIRFA UNIT COST	ACTUAL UNIT WAGE	OVERTIME	PAYROLL INSURANCE, TAXES, AND FRINGE	ACTUAL EXTENDED UNIT COST	=/- PIRFA
Crane Operator	Hour	\$ 31.37	\$ 20.00	\$ 4.20	\$ 13.31	\$ 37.51	\$ 6.14
Spotter	Hour	\$ 16.16	\$ 14.00	\$ 2.94	\$ 9.32	\$ 26.26	\$ 10.10
Rigger	Hour	\$18.59	\$15	\$ 3.15	\$ 9.98	\$ 28.13	\$ 9.54
Supervisor	Hour	\$36.22	\$60	---	\$33	\$93	\$ 56.78
Utility Laborer	Hour	\$16.16	\$12	\$ 2.52	\$ 7.99	\$ 22.51	\$ 6.35
Common Laborer	Hour	\$16.16	\$10.5	\$ 2.21	\$ 6.99	\$ 19.69	\$ 3.53

**COST TO HOLD 30 MINUTE DAILY SAFETY BRIEFING ABOUT WORKING AROUND POWER LINES.**

Cost Description	Unit	Units	Rate	Extended Cost
Crane Operator	Hour	0.5	37.51	18.755
Spotter	Hour	0.5	26.26	13.13
Rigger	Hour	0.5	28.13	14.065
Supervisor	Hour	0.5	93	46.5
Utility Laborer (2)	Hour	1	22.51	22.51
Common Laborer (2)	Hour	1	19.69	19.69
Crane	Hour	0.5	125	62.5
Supervisor's vehicle	Hour	0.5	10	5
Support Equipment	Hour	0.5	150	75
<b>Total Cost</b>				<b>277.15</b>

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**APPENDIX F**

**C-DAC MEMBERSHIP/NCCCO RELATIONSHIP**

<b>CDAC Member</b>	<b>CCO Relationship</b>
Position One	
Position Two	
Position Three	2 Fellow Employees CCO Commissioners
Position Four	
Position Five	5 – Union members CCO Commissioners, 1 – CCO Board of Directors Member
Position Six	CCO Board Member
Position Seven	
Position Eight	
Position Nine	CCO Commissioner
Position Ten	
Position Eleven	
Position Twelve	
Position Thirteen	
Position Fourteen	
Position Fifteen	
Position Sixteen	
Position Seventeen	
Position Eighteen	
Position Nineteen	CCO Commissioner
Position Twenty	CCO Commissioner; Does CCO prep training
Position Twenty One	

APPENDIX G

OSHA 1910.178 Powered Industrial Trucks	Similar language for crane operator
1910.178(I)(1) Safe Operation	Safe Operation
1910.178(I)(1)(i) The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (i)	XXXX.XXX(X)(X) The employer shall ensure that each crane operator is competent to operate a crane safely, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (x)
1910.178(I)(1)(ii) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (i), except as permitted by paragraph (i) (5).	XXXX.XXX(X)(X) Prior to permitting an employee to operate a crane (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (x), except as permitted by paragraph (x) (x). (x)
1910.178(I)(2) Training Program Implementation	XXXX.XXX(X)(X) Training Program Implementation
1910.178(I)(2)(i) Trainees may operate a powered industrial truck only:	XXXX.XXX(X)(X)(X) Trainees may operate a crane only:
1910.178 (I)(2)(i)(A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and	XXXX.XXX(X)(X) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and
1910.178 (I)(2)(i)(B) Where such operation does not endanger the trainee or other employees.	XXXX.XXX(X)(X) Where such operation does not endanger the trainee or other employees.
1910.178 (I)(2)(ii) Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the work place	XXXX.XXX(X)(X) Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of the operator's performance in the work place
1910.178 (I)(2)(iii) All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.	XXXX.XXX(X)(X) All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.
1910.178 (I)(3) Training program content. Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.	XXXX.XXX(X)(X) Training program content. Crane operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the crane in the employer's workplace.
1910.178(I)(3)(i) Truck-related topics:	XXXX.XXX(X)(X) Crane-related topics:
1910.178 (I)(3)(i)(A) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;	XXXX.XXX(X)(X) Operating instructions, warnings, and precautions for the types of cranes the operator will be authorized to operate;
1910.178 (I)(3)(i)(B) Differences between the truck and the automobile;	na
1910.178 (I)(3)(i)(C) Truck controls and instrumentation: where they are located, what they do, and how they work;	XXXX.XXX(X)(X)(X)(X) Crane controls and instrumentation: where they are located, what they do, and how they work;
1910.178 (I)(3)(i)(D) Engine or motor operation;	XXXX.XXX(X)(X)(X)(X) Engine or motor operation;
1910.178 (I)(3)(i)(E) Steering and maneuvering;	XXXX.XXX(X)(X)(X)(X) Steering and maneuvering;
1910.178 (I)(3)(i)(F) Visibility (including restrictions due to loading);	XXXX.XXX(X)(X)(X)(X) Visibility (including restrictions due to work area or crane body);
1910.178 (I)(3)(i)(G) Fork and attachment adaptation, operation, and use limitations;	XXXX.XXX(X)(X)(X)(X) Rigging, operation, and use limitations;
1910.178 (I)(3)(i)(H) Vehicle capacity;	XXXX.XXX(X)(X)(X)(X) Crane capacity;
1910.178 (I)(3)(i)(I) Vehicle stability;	XXXX.XXX(X)(X)(X)(X) Crane stability;
1910.178 (I)(3)(i)(J) Any vehicle inspection and maintenance that the operator will be required to perform;	XXXX.XXX(X)(X)(X)(X) Crane inspection and maintenance that the operator will be required to perform including required documentation.
1910.178 (I)(3)(i)(K) Refueling and/or charging and recharging of batteries;	XXXX.XXX(X)(X)(X)(X) Refueling and other fluid levels
1910.178 (I)(3)(i)(L) Operating limitations;	XXXX.XXX(X)(X)(X)(X) Operating limitations;

Mr. Robert Burt  
 Art Daniel  
 Proposed CDAC Standards

**APPENDIX H**

**ANTICIPATED WAGE ESCALATION**

Employee Classification	WAGE RATE*	ESCALATION RATE	PROJECTED ESCALATION	POSITIONS PER CREW	NUMBER OF CREWS	ESCALATION IMPACT/HOUR	
Crane Operator	\$ 37.51	15%	\$ 5.63	2	3	\$ 33.76	
Spotter	\$ 26.26	8%	\$ 2.10	0	3	\$ -	
Rigger	\$ 28.13	8%	\$ 2.25	0	3	\$ -	
Miner	\$ 23.44	8%	\$ 1.88	2	3	\$ 11.25	
Utility Laborer	\$ 22.51	8%	\$ 1.80	2	3	\$ 10.80	
Common Laborer	\$ 19.69	8%	\$ 1.58	1	3	\$ 4.73	
*ALL WAGES INCLUDE 21% OVERTIME FACTOR AND 55% LABOR BURDEN FACTOR						\$ 60.54	
						CREW HOURS ANNUALLY	2496
						ANNUAL COST IMPACT	\$ 151,110.69





October 31, 2005

Paul Causey  
North Texas Area Manager  
AGC of Texas, Inc.  
6220 N. Beltline Road, Suite 210  
Irving, TX 75063

**Subject: Proposal for the Planning, Creation, Development, & Deployment of a Nationally Accredited Crane Operator Certification Program**

Dear Mr. Causey:

This letter responds to your request, on behalf of Associated General Contractors of Texas (AGC of Texas), to the Consulting Measurement Group Incorporated (CMG) for a proposal to support AGC of Texas in their Crane Operators Certification Program in order to comply with the Crane and Derrick Standard, Section 1427 related to operator qualification and certification, part (a) Option (1): Certification by an accredited crane/derrick operator testing organization. We understand that, while AGC of Texas is interested in a program that will comply with all of Option (1), AGC of Texas is particularly interested in Subpart (i) of Option (1), which states that "For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment, and personnel have been met."

In this context, we understand that this project must address the planning, creation, development, and deployment of a certification process that is unbiased with regards to culture (language) and that successfully assesses the mastery or non-mastery of skill in a manner that meets accreditation standards such as those set forth by the National Commission for Certifying Agencies (NCCA), a separately governed accreditation arm of the National Organization for Competence Assurance (NOCA).

We understand that the certification program will be owned by AGC of Texas; that CMG is to administer the program; that the skill assessment must be conducted in American-English and Mexican-Spanish; that knowledge-base assessment must be conducted in written and oral formats, while assessment of the ability to operate a specific piece of equipment correctly and safely must be conducted with a practical, hands-on test. To this end, please consider this e-proposal; a hard copy to arrive shortly.

This proposal describes in detail activities and associated costs estimates for CMG to carry out the following summarized activities:

- Development and completion of project tasks that result in a certification program that complies with NCCA 21 national accreditation standards;
- Development of NCCA application, review, and submission;
- Meetings (onsite and offsite);

7071 Warner Ave. #F-400  
Huntington Beach, CA 92647  
cmg@webcmg.com

Tel 866-STATS-99  
Fax 401-275-2125  
www.webcmg.com



- Project Management.

The proposed timeline calls for CMG to begin work on the project upon reception of the signed contract and down payment. As first task, we can find a mutually convenient date to designate as a project kick-off, where schedules and organizational issues will be developed. This timeline will necessitate the prompt delivery of all necessary information by AGC of Texas to CMG, so that the extensive planning and resource allocation can be appropriately organized within CMG. The budget for this project is \$321,315 for consulting time with an estimated \$32,285 in expenses. Please note that all expenses are charged at cost with no processing or other fees.

All furnished information within the proposal, including prices, remain valid and applicable for the estimated dates of engagement (November 2005 through May 2006), assuming that AGC of Texas's acceptance of the proposal arrives by mid-November 2005. Otherwise, CMG reserves the right to revise project timelines and budget estimates as required to reflect internal resource allocation commitments.

Upon your acceptance of the proposal, please sign both copies of the separate contract. We look forward to working with you and your team on the creation of this cost-savings and in-house Nationally Accredited Certification Program. If I can provide any additional information, please contact me at 866-782-8799, or via email at [jdang@webcmg.com](mailto:jdang@webcmg.com).

Sincerely yours,

Jeff Dang, MPH  
Vice President and Research Scientist



**Proposal for the Planning, Creation, Development, &  
Deployment of a Nationally Accredited Crane Operator  
Certification Program**

Submitted to:

Associated General Contractors of Texas

6220 N. Beltline Road, Suite 210  
Irving, TX 75063

Submitted by:

Consulting Measurement Group, Inc.  
7071 Warner Ave., #F-400  
Huntington Beach, CA 92649

October 31, 2005



## **BACKGROUND.**

AGC of Texas has requested a proposal to support AGC of Texas in their Crane Operators Certification Program in order to comply with the Crane and Derrick Standard, Section 1427 related to operator qualification and certification, part (a) Option (1): Certification by an accredited crane/derrick operator testing organization. We understand that, while AGC of Texas is interested in a program that will comply with all of Option (1), AGC of Texas is particularly interested in Subpart (i) of Option (1), which states that "For a testing organization to be considered accredited to certify operators under this subpart, it must: (i) be accredited by a nationally recognized accrediting agency based on that agency's determination that industry recognized criteria for written testing materials, practical examinations, test administration, grading, facilities/equipment, and personnel have been met."

In this context, we understand that this project must address the planning, creation, development, and deployment of a certification process that is unbiased with regards to culture (language) and that successfully assesses the mastery or non-mastery of skill in a manner that meets accreditation standards such as those set forth by the National Commission for Certifying Agencies (NCCA, a separately governed accreditation arm of the National Organization for Competence Assurance, or NOCA).

We understand that the certification program will be owned by AGC of Texas; that CMG is to administer the program; that the skill assessment must be conducted in American-English and Mexican-Spanish; that knowledge-base assessment must be conducted in written and oral formats, while assessment of the ability to operate a specific piece of equipment correctly and safely must be conducted with a practical, hands-on test.

The activities within this proposal may be summarized as follows:

- Development and completion of project tasks that result in a certification program that complies with NCCA 21 national accreditation standards;
- Development of NCCA application, review, and submission;
- Meetings (onsite and offsite);
- Project Management.

This proposal is organized into three major sections. Section I details tasks and activities associated with obtaining national accreditation by a nationally recognized accrediting agency—NCCA. Section II addresses additional tasks to complete the deployment of this accreditation program, including create NCCA application and develop website for published information and dissemination to public and candidates. Section III outlines frequency of onsite and offsite meetings, costs, and project management needs of this project.

## **SECTION I—CRANE OPERATOR CERTIFICATION PROGRAM TASKS TO OBTAIN NATIONAL ACCREDITATION BY A NATIONALLY RECOGNIZED ACCREDITING AGENCY—NCCA.**

This section focuses in all steps needed to be taken to develop a crane operator certification program that complies with all of NCCA's national accreditation standards—21 in total. Briefly, these standards include those referring to (1) purpose, government, and resources, (2) responsibilities to stakeholders, (3) assessment mechanisms and instruments, (4) recertification, and (5) maintaining accreditation.



## **A. NCAA Standards on Purpose, Governance, and Resources—5 national accreditation standards.**

### **Phase 1. Three-day project initiation in Irving**

CMG will begin this project with a kick-off meeting in Irving. This meeting is designed to bring key personnel together in order to develop certification program goals, schedules, member composition plans, resource allocation plans, and begin discussion of the first set of NCAA standards: Purpose, Governance, and Resources.

- Prior to the meeting, CMG will prepare a complete meeting schedule in order to assure that the most pressing issues will be covered in the background. CMG will provide key AGC of Texas staff with pertinent background information prior to the meeting.
- CMG will bring along examples and ideas for consideration of all members to the meeting. These will all be created and processed prior to the meeting.
- CMG will provide direction for the meeting in order to assure that meeting goals are met and high member-agreement is obtained.
  - *Phase 1 Budget:* \$4,080 in time, \$2,050 in travel costs.
  - *Phase 1 Deliverables:* Background information prior to meeting, and meeting summary notes, including a master schedule.

### **Phase 2. Standard 1: Purpose statement**

In Phase 2, CMG will work with key AGC of Texas members to develop a purpose statement. This purpose statement will help guide development of the certification program, selection of board members, and development of the certification assessment instruments.

- CMG will provide examples of related purpose statements and key personnel will approve a final purpose statement.
  - *Phase 2 Budget:* \$340 in time
  - *Phase 2 Deliverable:* Purpose statement.

### **Phase 3. Standard 2: Structure & governance of certification program**

The objective of Phase 3 is to provide comprehensive structure to the certification program governance. The following tasks will be conducted during this phase:

- A comprehensive policies and procedures manual will be created detailing all of the governance issues developed throughout all of the standards.
- CMG and AGC of Texas will create a policy to delineate that that certification board is free from undue influence by AGC of Texas, the local union overseeing AGC of Texas crane operators, or otherwise. CMG will provide examples of such declarations.
- CMG and AGC of Texas will create a policy to delineate that the certification board has autonomy in decision making regarding eligibility standards, development of the assessment instrument, administration and scoring of tests, selection of personnel, and operating processes. CMG will provide examples of such declarations.
- Policies and procedures will be developed regarding how the purpose of the certification committee ties into the development, administration, and scoring of the assessment instrument. CMG will provide examples of such declarations.



- CMG and AGC of Texas will create policies that specify that the certification program does not require training in order to undergo certification testing, nor will it oversee training programs. CMG will provide examples of such declarations.
- CMG will assist AGC of Texas, as needed, to amend its bylaws so that the certification program is sufficiently autonomous. CMG will provide examples of such declarations.
  - *Phase 3 Budget:* \$16,630 in time
  - *Phase 3 Deliverable:* Policies and procedures manual and examples to guide decisions along the aforementioned steps.

**Phase 4. Standard 3: Develop certification board membership, including one consumer of public member**

In Phase 4, CMG will work with AGC of Texas in order to develop the selection criteria and ultimate composition of the certification program board. Once this board is assembled, AGC of Texas staff not on the board will have much less demands on their time. After this phase, the certification board will work with CMG in order to accomplish most of the remaining tasks to comply with NCCA standards. In order to develop the certification program board, the following tasks will be undertaken:

- CMG and AGC of Texas will develop policies and procedures for committee membership. It is ideal to consider union personnel and perhaps a member from another company that may be interested in sending its crane operators through your certification program. CMG will provide examples of such policies.
- CMG will work with AGC of Texas to establish timelines for board member participation of the various personnel.
  - *Phase 4 Budget:* \$3,400 in time
  - *Phase 4 Deliverable:* Results will be amended to the Policies and Procedures manual.

**Phase 5. Standard 4: Substantiate financial resources of certification program**

In Phase 5, CMG will work with the certification program board to develop a five-year budget and obtain commitment documentation from AGC of Texas for financial support. CMG will:

- Provide an outline to the board for all expenses to consider over the next five years. From there, CMG will work with the board to determine associated costs for all of the various activities and equipment necessary to maintain the certification program.
- CMG will work with the board to obtain a letter of commitment from AGC of Texas regarding financial backing, noting applicable bylaws of autonomous operation.
  - *Phase 5 Budget:* \$3,660 in time
  - *Phase 5 Deliverable:* CMG will provide (a) an outline for budget development, (b) a report on the final budget, and (c) a template for the board to draft a letter requesting a commitment letter from AGC of Texas.

**Phase 6. Standard 5: Establish that certification staff, consultants, and other personnel are sufficient for meeting certification program goals**

In Phase 6, CMG will work the certification board to develop a list of projects to complete over the next five years. This list of projects will then be reviewed to determine the qualification necessary to conduct such projects. CMG and the board will assign personnel



with sufficient qualifications to each of the tasks, detailing why key personnel involved with the project have sufficient qualifications to undertake the project. Job descriptions will also be delineated during this phase for general staff positions. A general description of key equipment of facilities will also be defined.

- CMG will work with the board to compile a detailed list of projects that will be necessary to maintain the certification program over the next five years. Templates will be provided by CMG.
- CMG will work with the board to develop a list of qualifications necessary to complete each of the projects required for the certification program. Templates will be provided by CMG.
- CMG will obtain and organize curricula vitas from key personnel and match these to project qualifications with a short biosketch.
- CMG will work with the board to determine job descriptions for general staffing requirements. Templates will be provided by CMG.
- CMG will work with the board to detail the necessary equipment and facilities necessary to maintain the certification program over the next 5 years. Templates will be provided by CMG.
- Develop a brief report on the findings to include in the overall psychometric report.
  - *Phase 6 Budget:* \$9,660 in time
  - *Phase 6 Deliverable:* Templates for (a) determining projects, (b) list of necessary qualifications, (c) general staffing requirements, (d) details of necessary equipment and resources. CMG will also provide (e) biosketches of key personnel.

## **B. NCAA Standards on Responsibilities to Stakeholders—4 national accreditation standards.**

### **Phase 7. Standard 6: Establish, publish, apply, & periodically review policies and procedures**

CMG will work with the board to establish board responsibilities, assuring confidentiality of candidates (including when confidentiality will be waived), publish and disseminate a Policies and Procedures manual, develop a process for candidates to question eligibility criteria and more, and develop policies and procedures to address disciplinary action against a candidate or certified operator in order to protect the public as well as maintain professional integrity.

- CMG, along with the certification program board, will prepare and refine a set of certification board member responsibilities. This will include:
  - Maintaining the fit between the purpose of the certification program and its functions
  - Develop eligibility criteria and application policies and procedures for candidates
  - Developing and maintaining materials for examinations

- Developing and maintaining a list of performance domains, tasks, and associated knowledge and skills (as done in the Job Task Analysis, below)
- Maintain and publish summary of certification status (number of applicants, number passed, number actively certified, % that pass, and so forth)
- Develop policies for disciplinary action, nondiscrimination (based on physical fitness requirements in CA law 5006.1), and confidentiality
- Provide a process for appealing test results, policies and procedures, and other committee board decisions
- Develop a calendar of recurring responsibilities
- CMG will provide a template for, and work to refine, with the board, details on assuring how candidate confidentiality is typically maintained, but delineate events that will lead to disclosure of information to the public.
- CMG will provide templates for, and work to refine, with the board, policies regarding candidate questions on eligibility criteria, test results, and certification status.
- In order to protect public safety and maintain the professional integrity of the field of crane operators and the certification board, disciplinary action policies and procedures must be developed and maintained by the board. CMG will provide templates and aid in the refinement of such policies.
  - *Phase 7 Budget:* \$3,060 in time.
  - *Phase 7 Deliverables:* Templates and final list of responsibilities for inclusion in the Policies and Procedures Manual.

**Phase 8. Standard 7: Publish description of development and psychometric research methods for the assessment instrument**

In this Phase, CMG will create the documents that will be used to guide the development and associated psychometric analyses to validate the assessment instrument.

- CMG will create a development document, detailing the plan. We will use validated test development techniques, such as those discussed in Anastasi & Urbina (1998), Clark and Watson (1995), and using associated ethical development defined by AERA, APA, and NCME (American Education Research Association, American Psychological Association, & National Council on Measurement in Education, 1999) as noted in California law 5006.1 and NCCA standards.
- CMG will create a psychometric validation document, detailing the planned analyses. These will cover issues on sample size requirement (Cohen, 1988), item-level reliability (Anastasi & Urbina, 1998; Foster & Cone, 1995), scale-level reliability (Anastasi & Urbina, 1998; Briggs & Cheek, 1986; Cortina, 1993), rater reliability for practical tests (Cole & Herman, 2005; ShROUT & Fleiss, 1979), item selection (Cole, Rabin, Smith, & Kaufman, 2004), convergent validity (Haynes, Richard, & Kubany, 1995), and item bias review (Camilli & Shepard, 1994; Holland & Wainer, 1993).
- CMG will create a document on test administration guidelines, including training for test proctors, raters, and other key personnel.



- CMG will review all of these documents with the certification program board and amend as desired by the board.
  - *Phase 8 Budget:* \$14,940 in time.
  - *Phase 8 Deliverables:* Background information prior to meeting, and meeting summary notes, including a master schedule.

**Phase 9. Standard 8: Establish policy to only certify after assessment of applicant through assessment instrument and validated program**

CMG will develop a template to refine with the certification program board that will address two issues:

- Under some limited circumstances, the board may certify a few of the developing members of the assessment instruments. The board must clearly delineate how these situations will be allowed and under what evaluation sufficient experience is warranted.
- Once the certification program has been accredited by NCCA, no grandfathering will be allowed.
  - *Phase 9 Budget:* \$850 in time.
  - *Phase 9 Deliverables:* CMG will provide templates for this information and amend the final policies into the Policies and Procedures Manual.

**Phase 10. Standard 9: Maintain list, and providence verification, of certified individuals**

CMG will create a database for use by the certification program board to track certified member information, including current status, date of certification expiration, contact information, and the like.

- *Phase 10 Budget:* \$2,340 in time.
- *Phase 10 Deliverables:* Database to track certified individuals.

**C. NCAA Standards on Assessment Instruments—9 national accreditation standards.**

**Phase 11. Standard 10: Analyze, define, & publish performance domains and tasks related to purpose of credentials, and how knowledge/skills associated with performance domains will be related to the assessment instruments: preparatory work to define written survey, oral interview, and hands-on test of ability**

CMG will organize, implement, oversee, and analyze a job task analysis and related survey of content domains. These results will be used to guide the development of the assessment instrument. Moreover, these results can be used to develop a training program (independent from the certification program). CMG will conduct the following steps:

- Develop the protocol for the job task analysis.
- Create protocol for content sampling and item writing.
- Find appropriate observers for the job task analysis.



Consulting Measurement Group

- Find crane operators to be viewed by observers in the job task analysis.
- Train the observers for the job task analysis, including a mock observation. Use standards for training observers as detailed in Foster and Cone (1986).
- CMG will take care of the financial obligations for the observers, including necessary reporting of 1099s and the like.
- Review of the data from the job task analysis will be conducted by CMG and presented to the certification program board.
- Find appropriate subject matter experts.
- CMG will take care of the financial obligations for the subject matter experts, including necessary reporting of 1099s and the like.
- For each knowledge-based test, the written and oral forms, conduct the following tasks:
  - Work with subject matter experts to sharpen information about the domains from the board and job task analysis.
  - Develop domain survey and interview protocols based on standard survey and interview development techniques (Chadwick et al., 1997).
  - Develop a random list of crane operators to whom the written survey will be sent or who will be invited to participate in the oral test.
  - Create the final written survey and oral interview and review with board.
  - Train test administrators (written test) and interviewers (oral test) to administer the test in an unbiased manner.
  - Collect data:
    - i. Mail written survey, instructions, and return envelopes to crane operators.
    - ii. For oral interview, invite test operators to take the oral interview.
  - Enter data from surveys into statistical software.
  - Analyze written survey and oral interview data (Chadwick et al., 1997).
  - For oral interview, conduct interrater reliability analyses to show that the oral test can be administered by different individuals with the same result.
  - Develop an algorithm to determine the appropriate domain representation in the assessment instrument.
  - Complete and publish report on entire job task analysis and survey process, including details linking the job task analysis to the assessment instrument development.
- For the hands-on practical test of ability, conduct the following tasks:
  - Work with subject matter experts to sharpen information about the domains from the board and job task analysis.
  - Develop a random list of crane operators to invite to participate in the hands-on test.
  - Create the final hands-on test and review with board.

- Train test expert raters to administer the test in an unbiased manner.
  - Test a sample of crane operators with trained expert raters.
  - Enter data into statistical software.
  - Analyze the data.
  - Conduct interrater reliability analyses to show that the test can be administered and judged by different expert raters with the same result.
  - Create a procedure to be followed in cases when the expert judges disagree in their evaluation of an individual crane operator or if the test-taker disagrees with the evaluation.
- 
- *Phase 11 Budget:* \$53,020 in time, \$12,250 in costs for observers, subject matter experts, and mailings.
  - *Phase 11 Deliverables:* CMG will provide to the board (a) protocol for job task analysis, (b) presentation on job task analysis results, (c) presentation of survey of domain importance and frequency, (d) database of the survey, and (e) a complete report on the job task analysis and survey results.

**Phase 12. Standard 11: Develop assessment instruments: written survey, oral interview, and hands-on test of ability**

The most important undertaking is the premiere aspect of the proposal. CMG will follow the aforementioned assessment instrument development guidelines, matching assessment instrument aspects to the job task analysis. We will develop the written and oral knowledge-based tests to be used as an advanced item bank so that items can be alternated appropriately from one testing to another using sophisticated psychometrics called item response theory (Hambleton, Swaminathan, & Rogers, 1991a; Wainer, 1983). Should you ever decide to use a computerized test, the item response theory (IRT) bank will be easily adapted.

To develop the written and oral tests, CMG will complete the following tasks:

- Create the assessment instrument development protocol based on the board-approved development documentation and results from the job task analysis.
- Create protocol for content sampling and item writing.
- Train subject matter experts on item writing using techniques from Clark and Watson (1995), Camilli and Shepard (1994), and Smith and McCarthy (1995).
- CMG will take care of the financial obligations for the subject matter experts, including necessary reporting of 1099s and the like.
- Review results of items from subject matter experts with the certification program board.
- Create formatted written tests and score sheets for practical tests.
- Work with subject matter experts to develop equipment for practical tests.
- Develop the protocol for the pilot testing of the assessment instrument.
- Invite a random pool of participants for testing—in both the written and oral forms.

- Train test proctors (written), interviewers (oral) and expert judges (hands-on).
- Make recommendations on: (a) how the test should be administered (e.g., Scantron or computer-based) and (b) purchase new software.
- Set up and train key staff on scoring software.
- Monitor the first week of testing: written survey, oral interviews, and hands-on tests.
- Convert test data in statistics program for analysis.
- Analyze item-level reliability with standard and sophisticated techniques, such as corrected item-total correlations, probability distributions, item information functions, and alpha-deleted statistics (Anastasi & Urbina, 1998; Foster & Cone, 1995)
- Analyze scale-level reliability with standard and sophisticated techniques, such as test information functions, coefficient alpha, average interitem correlations (Anastasi & Urbina, 1998; Briggs & Cheek, 1986; Cortina, 1993)
- Analyze rater reliability for practical tests with appropriate correlation and intraclass correlation statistics (Cole & Herman, 2005; Shrout & Fleiss, 1979).
- Analyze convergent validity among the tests with convergent validity correlations (Haynes et al., 1995)
- Analyze item bias and eliminate any problematic items using differential item functioning (Camilli & Shepard, 1994; Holland & Wainer, 1993).
- Analyze item selection with a sophisticated technique to preserve domains and item characteristics (Cole et al., 2004)
- Analyze interrater reliability across expert judges (applies for oral test).
- Equate written and oral knowledge-based test forms to ensure that the scores are comparable across tests.
- Write a detailed document of the psychometric findings and present to the board.
- Develop schedules for the board to have an annual review of the cohesion between the assessment instrument and job task analysis.
- Develop policies and procedures to review items periodically.
- Develop policies and procedures to review test psychometrics periodically.

To develop the hands-on practical test, CMG will complete the following tasks per specific piece of equipment:

- Create the assessment instrument development protocol based on the board-approved development documentation and results from the job task analysis.
- CMG to work with subject matter experts (already trained on item writing as stated above under knowledge-based tests) to develop items.
- CMG will take care of the financial obligations for the subject matter experts, including necessary reporting of 1099s and the like.
- Review results of items from subject matter experts with the certification program board.

- Create formatted written tests for test proctors to use with test takers and score sheets for practical tests.
- Work with subject matter experts to develop equipment for practical tests.
- Develop the protocol for the pilot testing of the assessment instrument.
- Work with ACG of Texas to prepare a site to be used for hands-on testing and to invite a random pool of participants for testing.
- Train test proctors and raters for practical tests, including mock tests.
- Set up and train key staff on scoring software.
- Monitor the first week of testing.
- Convert test data in statistics program for analysis.
- Analyze item-level reliability with standard and sophisticated techniques, such as corrected item-total correlations, probability distributions, item information functions, and alpha-deleted statistics (Anastasi & Urbina, 1998; Foster & Cone, 1995)
- Analyze scale-level reliability with standard and sophisticated techniques, such as test information functions, coefficient alpha, average interitem correlations (Anastasi & Urbina, 1998; Briggs & Cheek, 1986; Cortina, 1993)
- Analyze rater reliability for practical tests with appropriate correlation and intraclass correlation statistics (Cole & Herman, 2005; Shrout & Fleiss, 1979).
- Analyze convergent validity among the tests with convergent validity correlations (Haynes et al., 1995)
- Analyze item bias and eliminate any problematic items using differential item functioning (Camilli & Shepard, 1994; Holland & Wainer, 1993).
- Analyze item selection with a sophisticated technique to preserve domains and item characteristics (Cole et al., 2004)
- Equate multiple forms, in multiple forms are used.
- Write a detailed document of the psychometric findings and present to the board.
- Develop schedules for the board to have an annual review of the cohesion between the assessment instrument and job task analysis.
- Develop policies and procedures to review items periodically.
- Develop policies and procedures to review test psychometrics periodically.
  - *Phase 12 Budget:* \$75,785 in time, \$6,500 in expenses for subject matter experts, mailing invites to test participants.
  - *Phase 12 Deliverables:* CMG will provide the following deliverables: (a) Assessment instrument development protocol, content sampling & item writing protocol, presentation to board on final items from subject matter experts, formatted tests and scoring sheets, recommendation on test administration format (e.g., Scantron or computer-based), Psychometric Findings report, amendments to the Policies and Procedures manual detailing review policies for items, psychometrics, and match between assessment instrument and job task analysis.



### **Phase 13. Standard 12: Set cut scores**

CMG will work with the board and subject matter experts to determine appropriate cutoff scores for the knowledge-based (written & oral) and practical (hands-on) tests. In doing so, we will also examine the standard error of measurement around the cut scores and determine with the board the best tactics for addressing a score that falls within the standard error of measurement. For Phase 13, CMG will:

- Develop a cut-score analysis protocol.
- Conduct a cut-score review meeting with the subject matter experts. These findings will be presented to the board for their approval.
- Analyze the standard error of measurement based on the determined cut scores.
- Work with the board to develop policies regarding what will occur if a subject's score falls within the standard error of measurement of the cut score. CMG will provide templates of ideas for this process.
- Publish results.
  - *Phase 13 Budget:* \$6,400 in time.
  - *Phase 13 Deliverables:* (a) Cut-score analysis protocol, (b) presentation to the board on subject matter experts' recommendations for cut scores, (c) policy regarding standard error of measurement and cut scores, and (d) written report.

### **Phase 14. Standard 13: Document psychometrics for scores, interpretations, and reporting assessment instrument results**

In Phase 14, CMG will provide a report for detailing how judges were trained, including their qualification criteria as determined by the board. CMG will also work with the board to create a score report template; a template that will model how scores will be given to candidates after their exam, including explanations of their scores. CMG will also conduct an analysis to determine if reporting score information on each domain is psychometrically warranted. Finally, policies will be developed detailing how candidates can receive more information about their scores, test information, and psychometrics. CMG will provide:

- Report of selection criteria for judges as well as detailing judge training.
- CMG will work with the board to create a score-report template that will detail the information and presentation of scores on the assessment instrument to candidates after their testing.
- Analysis of the standard errors of measurement to determine if there is sufficient reliability in the score report to detail which domains are strengths and which are weaknesses. This will be conducted using a method detailed in Cole, Lopez, and McLeod (2003). Such information helps guide failing candidates to their specific areas of weakness in order to enhance their preparation for their next testing.
- Amendments to the Policies and Procedures Manual to detail how candidates can obtain or question information on their scores, psychometrics of the assessment instrument, and other test information.
- Publish information regarding the proper and improper use of test results.
- Develop a process with the board for candidates to contest their scores.
  - *Phase 14 Budget:* \$11,330 in time.



- *Phase 14 Deliverables:* (a) Report on judges, (b) score-report template, (c) findings on the domain standard error of measurement, and (d) amendments to the Policies and Procedures Manual.

#### **Phase 15. Standard 14: Ensure reported scores are sufficiently valid**

This is all part of Standard 11 analyses. Nothing additional needs to be done here if Phase 12 (Standard 11) is conducted.

- *Phase 15 Budget:* \$0 in time.
- *Phase 15 Deliverables:* N/A.

#### **Phase 16. Standard 15: Different forms are equivalent, including American-English and Mexican-Spanish forms**

Equivalence analyses of alternate forms (if multiple forms are used) of the American-English knowledge base instrument or of the hands-on practical instrument and reports are part of Standard 11 (Phase 12). In addition, CMG will create a scaling for score presentation to candidates, as NCCA discourages reporting raw scores. Furthermore, CMG will contract with a vendor to translate the American-English form(s) via an established standard forward-backward-harmonization translation method to develop the Mexican-Spanish equivalent form(s) and the examine psychometric equivalence of the translations. Upon data collection of Mexican-Spanish forms, CMG will conduct a set of classical and modern psychometric methods to examine psychometric equivalence. Finally, a protocol will be developed for the process of pilot testing new items.

- American-English equivalence analyses and reports were done in Standard 11.
- CMG will convert scores to a scaled score, recommending a scaled score of 0 to 100 for easy interpretation.
- CMG will contract with a vendor to translate the American-English form(s) via an established standard forward-backward-harmonization translation method to develop the Mexican-Spanish equivalent form(s). Cost of this work must first be approved by AGC of Texas before they are passed on to AGC of Texas.
  - Briefly, this process involves two Mexican-Spanish native speakers who are also fluent in American-English translating the American-English form(s) independently, and then meeting to reconcile any differences. Next, a native of American-English fluent in Mexican-Spanish translates the reconciled translation back to English. This backward translation is then compared to the original American-English form to confirm conceptual equivalence. Finally, this method includes a cognitive debriefing step in which three native speakers of Mexican-Spanish evaluate the clarity, comprehensibility, and acceptability of the translation. Translation of the two languages are then subjected to an international (two cultures in this case) harmonization to ensure equivalence of concepts and consistent use of colloquial language across the translations.
- CMG will conduct classical and modern psychometric methods to examine the psychometric equivalence of the American-English and the Mexican-Spanish forms, including item-level and scale-level analyses as well as differential item functioning analyses.
- CMG will develop a protocol for testing new items inside of regular test administrations. Piloted items will not be counted for candidate scores, but this

process will allow for pilot testing of new items without having to incur the cost of collecting more pilot testing on its own. Given that CMG will implement an item bank using item response theory, such item piloting can be used to form new tests without having to rerun the psychometric analyses of the tests on a validation sample prior to use.

- *Phase 16 Budget:* \$18,060 in time for psychometric analyses to assess the psychometric equivalence of the Mexican-Spanish translation and document the work, create scaled scores, document details on interpretation and rationale, and other tasks. Cost of vendor to conduct translation will be passed onto ACG of Texas at cost.
- *Phase 16 Deliverables:* Background information prior to meeting, and meeting summary notes, including a master schedule. Mexican-Spanish translation(s). Document with results of psychometric analyses to examine the psychometric equivalence of Mexican-Spanish form(s).

**Phase 17. Standard 16: Develop appropriate, standardized, and secure procedures for development and administration of the assessment instrument**

Assessment instrument development procedures have been addressed in Standard 11. Additionally, CMG will develop protocols for the entire testing process from application to test reporting, and all phases in between, for both the written and practical exams. We will develop training protocols for the chief examiner and proctors, as well as forms to note test session irregularities to be filled out by the test proctors. We will work with the board to develop policies that assure all candidates have access to preparatory materials as well as security protocols to limit access to the assessment instrument. Finally, we will create a detailed document of all of the test sites, assuring uniformity, and sufficiency.

- CMG will create a report to detail the entire testing process from start to finish for written and practical tests.
- CMG will develop training protocols for the chief examiner and proctors, including developing forms for irregularities during testing.
- CMG will work with the certification program board to produce a policy that all candidates will have equal access to preparatory materials.
- CMG will develop a protocol to delineate and restrict as much as possible all access to the assessment instrument and item bank. This will include mandating locks on file cabinets, alarm on building for test site, no e-mail delivery of test forms, computers to be password coded and not connected to the internet or modem.
- CMG will visit and document the equivalence and sufficiency of all test sites.
  - *Phase 17 Budget:* \$14,390 in time, \$3,000 in travel costs.
  - *Phase 17 Deliverables:* (a) Testing administration protocol, (b) chief examiner and proctor training protocol, (c) test irregularity form, (d) amendments to Policies and Procedures Manual on candidate access to preparatory materials and security policies for access to assessment instrument and item bank, and (e) report on the similarity and sufficiency of test site locations.

**Phase 18. Standard 17: Retain all information and data for psychometric evidence**

CMG will work with the certification program board to develop policies and procedures to ensure items, forms, tests booklets, and the like, are all securely stored, detail who will



have access to secure information (for each type of information), and develop timelines through which various information shall be retained.

- CMG will provide templates to the board and work to refine for these various policies and procedures.
  - *Phase 18 Budget:* \$3,360 in time.
  - *Phase 18 Deliverables:* Amendments to the Policies and Procedures Manual.

#### **Phase 19. Standard 18: Secure retention for assessment instrument results and scores**

CMG will work with the certification program board to develop policies and procedures to detail the manner and timelines for keeping information regarding candidate status and scores, for both passing and failing candidates.

- CMG will provide templates to the board and work to refine for these various policies and procedures.
  - *Phase 19 Budget:* \$680 in time.
  - *Phase 19 Deliverables:* Amendments to the Policies and Procedures Manual.

### **D. NCAA Standards on Recertification—2 national accreditation standards.**

#### **Phase 20. Standard 19: Develop recertification process**

CMG will work to develop policies and procedures regarding the wordage and dissemination to public and candidates for recertification. CMG will also work to develop consequences for not recertifying (e.g., loss of certification and need to wait a few months before another testing is available).

- CMG will provide templates to the board and work to refine for these various policies and procedures.
  - *Phase 20 Budget:* \$2,380 in time.
  - *Phase 20 Deliverables:* Amendments to the Policies and Procedures Manual.

#### **Phase 21. Standard 20: Demonstrate recertification requirements measure competence**

CMG will create a report detailing the benefits of using item response theory to create recertification tests and understand their reliability without needing to assess in a new sample. This allows for the use of an assessment instrument that is different than the one an operator took at initial certification, but still understand the link between the two assessment instruments in order to provide a constant cut score and consistent psychometrics. This approach affords extensive cost savings while maintaining psychometric integrity.

- *Phase 21 Budget:* \$1,850 in time.



- *Phase 21 Deliverables:* Report on item response theory use to conform to psychometrically appropriate recertification.

## **E. NCAA Standards on Maintaining Accreditation—1 national accreditation standard.**

### **Phase 22. Standard 21: Continue compliance with standards to maintain NCCA accreditation**

CMG will work with the certification program board to develop policies and procedures to ensure continued compliance with NCCA and allow for smooth reaccreditation.

- Board will annually complete and submit information requested by NCCA on program.
- Board will report substantial changes in purpose, structure or activities, as well as exam administration changes, exam technique changes, or scope changes.
- Board will submit any information NCCA requests in order to investigate a claim of noncompliance by the certification program.
  - *Phase 22 Budget:* \$680 in time.
  - *Phase 22 Deliverables:* Amendments to the Policies and Procedures Manual.

## **SECTION II—CRANE OPERATOR CERTIFICATION PROGRAM ADDITIONAL TASKS.**

### **Phase 23. Create NCAA application**

CMG will compile all of the information collected throughout the implementation of the standards into the NCCA application, including conducting an exhaustive edit and final review. The final application will conform to all of NCCA formatting criteria.

- *Phase 23 Budget:* \$36,600 in time and \$175 in costs for the NCCA application and mailing.
- *Phase 23 Deliverables:* NCCA application.

### **Phase 24. Develop simple website for published information and dissemination to public and candidates**

CMG will compile all of the information collected throughout the implementation of the standards that is intended for public and candidate information and format it into a basic website. If so desired, this website can be integrated into a broader formatting either by AGC of Texas or CMG (for an additional cost). CMG will also register a domain name for the website based on the desires of the certification program board.

- *Phase 24 Budget:* \$8,915 in time and \$150 in costs for the domain name registration.
- *Phase 24 Deliverables:* Website files.



## **SECTION III—MISCELLANEOUS.**

### **1. Biweekly onsite meetings in Irving by CMG**

CMG will plan on a 2-day biweekly meeting in Irving to attend to project details.

- *Biweekly Onsite Meeting Budget:* \$12,750 in time and \$8,700 in travel costs.

### **2. Other biweekly meetings offsite between CMG and Certification Program board**

CMG will plan on a 2 hour biweekly phone meeting to attend to project details.

- *Biweekly Offsite Meeting Budget:* \$4,080 in time.

### **3. Project management**

CMG will attend to all project management details with great specificity and earnest, planning ahead for meetings with preparatory templates, schedules, and much more.

- *Project Management Budget:* \$12,075 in time.



## **Expert Research and Statistical Consultants**

The project staff at Consulting Measurement Group (CMG) has extensive training in the development, collection and analysis of customer satisfaction surveys. The project director and leader, Jason Cole, PhD (see below), has helped several organizations in the fields of healthcare, education, and industry to develop and analyze customer satisfaction and loyalty surveys.

CMG's staff has received formal educational training and applied professional skills in program evaluation and outcomes research. This experience allows CMG to utilize the most advanced scientific approaches in order to develop more accurate and consistent measures as well as produce credible analyses and results. Some of the research processes most frequently used by CMG in conducting customer satisfaction and loyalty study form part of this proposal, including test development, psychometrics, and advanced statistics using the highest ethical and scientifically rigorous methods. CMG has experience in leading organizations to achieve nationally-accredited certification.

## **Project Leadership**

The proposed tasks and budget estimate reflect CMG's plans to:

- *Jason C. Cole, PhD, President and Senior Research Scientist*, will provide project leadership, overseeing all project aspects;

Jason Cole was a founding member of CMG in 1999 and now has ten years of experience as a statistician and methodologist. As the senior psychometrician and statistician at CMG, Jason has headed most consulting projects, working on tasks such as development of new tests, evaluating the efficacy of new tests, and helping others implement strong psychometric tactics to an array of fields. Jason is also an avid research scientist with publications in many leading journals in the field of assessment and psychometrics. Jason has a PhD in clinical psychology from California School of Professional Psychology and also serves as a Senior Consulting Scientist for QualityMetric, a world leader in health-related test and evaluation. Jason has also served as a senior statistician at UCLA and is currently a member of the American Education Research Association, American Psychological Association, National Committee on Measurement and Assessment, and National Commission for Certifying Agencies (including serving as a member of their Publications Committee).

- *Jeff Dang, MPH, Vice President and Research Scientist*, will assist with the statistical and psychometric analysis, assist with project management, aid in test refinement process, and provide sophisticated input on analytic plans;

Jeff Dang has been with CMG for over a year and now has six years of experience as a statistician and methodologist. As a consultant at CMG, Jeff has recently lead projects dealing with psychometric reviews, item response theory, and item bias assessment. Jeff is also an avid research scientist with publications in leading journals in the field of assessment, psychometrics, and public health. Jeff has a Master's in Public Health (MPH) from Columbia University and is working to complete his PhD in public health at UCLA.



**Budget Estimate**

The total cost for the entire project as described here is \$321,315 for time and \$32,825 in expenses. Not covered in this proposal is time or expenses for any additional work by CMG on this topic beyond that described above, nor does it include any additional expenses (time and/or travel) that may be requested by AGC of Texas.

**Project Timelines**

The proposed timeline calls for CMG to begin work on the project upon proposal acceptance in November 2005 with a three-day kick off meeting. The kick off meeting will be used for CMG and AGC of Texas to determine interim and ultimate timelines. This timeline assumes that CMG has received the signed contract from AGC of Texas and down payment, all of which must be received by November 15, 2005.

**Payment Schedule**

Upon acceptance of this proposal, CMG will invoice AGC of Texas according to the payment schedule shown below. All fees herein are based upon an estimate of the time necessary to complete each task. Whereas we strive, and frequently achieve, to complete the work under our estimate, AGC of Texas understands that they will be billed for the actual costs incurred on a project (including any applicable expenses).

<u>Event / Milestone</u>	<u>Invoice Amount</u>
Project Acceptance (1/4 down payment)	\$88,535
Second Payment on January 31, 2005 (1/4 of total)	\$88,535
Third Payment on May 30, 2006 (1/4 of total)	\$88,535
Project Completion (completion reports submitted to AGC of Texas from CMG) (remainder to be paid upon project completion)	\$88,535
Total	\$354,140

All invoices are due upon receipt. Payments and questions about invoices or payments should be directed to:

Consulting Measurement Group, Inc.  
7071 Warner Ave., #F-400  
Huntington Beach, CA 92649  
Tel. 866-782-8799

## REFERENCES

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- Wright, B. D., & Stone, M. H. (1979). *Best test design: Rasch measurement*. Chicago, IL: MESA Press.



## APPENDIX

### CLIENT REFERENCES

The following is a brief list of recent CMG clients:

Company	Contact	Address	Project	Dates
NESTA	Scott Baines	30245 Tomas Rancho Santa Margarita, CA 92688	Survey design review, Survey analysis	May, 2005
Operating Engineers Training Trust	Ron Havlic	2200 S. Pellissier Place Whittier, CA 90601	Survey design and analysis, test design and analysis (x2)	March, 2004 - December, 2004
Kolar Advertising	Whitney Harlan	8500 Bluffstone Cove, Suite 200A Austin, TX 78759	Survey measurement error analysis	May, 2005

With our personal attention and strong emphasis on customer satisfaction, we have had no clients in the past year that we have lost for any reason. Indeed, CMG has never lost an active client during our six-year history.

### CLIENT WORK SAMPLES (DEMOS)

Brief excerpts from three different technical reports are provided below (reference list omitted).

#### Form Equating

Presently, a single form exists for each of the *X* tests and, therefore, no procedures were necessary for equating variant forms for the tests. Nevertheless, the long-term plans for test maintenance include the addition of new items in order to assure that item contents remain secure and that persons taking the test multiple times do not obtain increased scores simply from their experience with the test. Given the goal to incorporate new items into each of the tests on a regular basis, an approach for item banking was developed that is both psychometrically sound and administratively efficient.

Item banking is a process whereby the difficulty of an item is linked to all other items through a process of reference items. In order to develop an appropriate item bank that can be compared across various groups of test takers, items must be calibrated using item response theory (IRT; Hambleton, Swaminathan, & Rogers, 1991b; Wright & Stone, 1979). IRT is a process whereby the estimated item characteristics (such as the item difficulty) are independent of the other items in a test and independent from the sample from which they were obtained. Compared to the subjective, costly, and protracted nature of judgmental methods, item banking is highly objective, inexpensive, and expedient. Also, compared to classical test equating processes such as probability matching, item banking does not depend on the skill level of persons taking the test nor does it require that all items from both forms be administered to the same group for proper equating.



In order to develop an IRT-based item bank and subsequent alternative form for any of the tests, the following steps will occur...

### Standard Error of Measurement

If a person were to take the same test repeatedly, you would expect their test scores to fluctuate due to factors such as chance, testing conditions, and imperfect test reliability. In statistical terms, this dispersion of measurement errors is estimated by the standard error of measurement (SEM) for a test. The SEM is used to estimate the variance of the observed test scores if it were possible to calculate a person's score across an infinite number of iterations. Closely related to the term SEM is the concept of a true score which equals the average of all the observed test scores if it were possible to calculate a person's score across an infinite number of iterations. Although an infinite amount of repetitions would likely generate a group of scores that would be normally distributed, it would take an extraordinary amount of time to do this in practice and sheer exhaustion logistically prevents this activity. Thus, statisticians approximate this variance by using two components: the standard deviation of the test scores ( $\sigma$ ) and the reliability coefficient ( $\alpha$ ) for the test. The equation is as follows:

$$SEM = \sigma \sqrt{1 - \alpha}$$

Furthermore, the SEM can be used to create a band around an observed test score to provide a margin of error that is likely to contain the true score. In other words, if a person were to take the test over and over again it is likely that the person's true score would lie within this band. In the case for the  $X$  test ...

### General psychometrics

The goal of the psychometric review was to assure that all covariates used in the survival model would be sufficiently accurate and valid to warrant their inclusion in the survival model. Adding covariates that have poor reliability or validity can be an inefficient use of power (Tabachnick & Fidell, 2001). Psychometrics were conducted in a stepwise format in adherence with guidelines proposed by Clark and Watson (1995). Analyses began at the item level, continued to the scale-level, and finished interscale relationships.

Prior to analysis, missing data for any item used in a covariate scale were corrected by single-point multiple imputation (Rubin, 1996; Schafer, 2001; Schafer & Graham, 2002). This process uses the expectation-maximization algorithm and maximum likelihood estimation to determine the most probable response for each missing cell in the database. Single-point multiple imputation was selected over other missing data replacement techniques as Schafer and Graham (2002) have found that multiple imputation is among the best processes for missing data handling and Rubin and Schenker (1991) give ample evidence that a single-step imputation works as effectively as multiple steps. Imputation was conducted for each scale, rather than for all items in all scales at once. As single-point multiple imputation uses the interrelationship among the components used during its estimation (i.e., the particular set of items used for one imputation analysis), conducting separate imputations for each of the subscales should enhance the reliability of the imputation results (Schafer & Graham, 2002; Schafer & Olsen, 1998). As some items were used in multiple scales, was only subjected to imputation once but was left in all subsequent imputation analyses as a complete variable in order to enhance the imputation procedures for subsequent scales with an already imputed item.



Item-level analyses included examining the frequency of responses, standard deviations, corrected item-total correlations, and alpha-if-item-removed statistics for each item in a scale. Inspection of an item's frequency of responses assures that all items for a scale are scored in the correct direction (i.e., reverse scoring was implemented appropriately when necessary), provides a review for inappropriately coded data (e.g., a 6 on an item that has responses choices from 1 to 5), and provides an inspection of an item's distribution of responses in order to ascertain if marked skewness is found in a variable (Tabachnick & Fidell, 2001). Examination of the standard deviation is conducted to assure that all items have variability – without variability in responses items cannot be used in psychometric analyses (Anastasi & Urbina, 1998). Corrected item-total correlations (i.e., a correlation between an item and the total of the rest of the items on a scale) that exceeded a medium effect size ( $r \geq .30$ ) were deemed to be adequate, medium-large ( $r \geq .40$ ) effects were good, and large effects ( $r \geq .50$ ) were excellent (see Cohen, 1988, 1992). As noted by Muenz, Ouchi, and Cole (1999), item-total correlations can be used for an indication of both reliability (i.e., how well does an item fit with a scale) and validity (i.e., how well does this item measure to theoretical construct for the scale). Alpha removal statistics were used to identify items that had a negative impact on the estimate of internal consistency. An item with an alpha removal of .01 lower than the overall test (or equal to or higher than overall alpha of the test) was marked as poor.

The scale-wide reliability analyses were conducted to determine the overall cohesiveness and viability of items. Once poorly performing items had been removed from a scale during the item-level review, examination of the scale-wide internal consistency was conducted to determine the cohesiveness of the remaining items. Internal consistency was assessed with coefficient alpha (Cronbach, 1951) or standardized alpha for scales that had items with different ranges (Anastasi & Urbina, 1998), as well as the average interitem correlation (see Briggs & Cheek, 1986). In this study, internal consistency was determined to be adequate at .70, good at .80, and excellent at .90. Clark and Watson (1995) and Cortina (1993) have recommended analyzing the average interitem correlation along with alpha. According to Briggs and Cheek (1986), average interitem correlations should fall between .15 and .50 for general scales (such as depression) and between .35 and .60 for specific scales (such as religiosity).

Finally, convergent validity correlations between total scores of the refined and acceptable measures (based on the first 2 steps) were conducted for two purposes. First, measures of similar constructs should have sufficiently high correlations between them in order to demonstrate each scale's ability to measure similar constructs (Anastasi & Urbina, 1998). Correlations should not fall below .3 (per the criterion of a medium effect; see Cohen, 1988) for another of the measures examined herein. Second, it was important to exclude scales from the survival analysis that had very high correlations with another measure as it would be a waste of power to include two scales measuring nearly the same construct (Tabachnick & Fidell, 2001). Correlations were conducted with Spearman rank-order correlations to avoid the likely issue of nonnormality often found in psychological measures of distress (Cole et al., 2004).

## **COMPANY BROCHURE**

Consulting Measurement Group (CMG) was established to meet corporate, professional, government, and academic/educational measurement and psychometric needs. We are an educationally and technologically progressive company that values exceptional customer service while adhering to the highest ethical and professional standards.



CMG members maintain professional affiliations with organizations such as the American Psychological Association, American Education and Research Association, American Public Health Association, National Committee for Measurement and Assessment, and National Commission of Certifying Agencies. Furthermore, CMG has a reputable history of consulting and collaborated extensively with numerous organizations in a variety of settings. To name a few, CMG members have worked with large companies such as Educational Testing Service, American Guidance Service, Universal Music Group, Sharp-Mesa Vista Hospital, and Access Group. CMG members have also worked with non profit organizations such as The Wellness Community and AnimAction as well as academic researchers at the University of Georgia's Center for Special Education and UCLA's Cousins Center for Psychoneuroimmunology.

We offer services in the fields of statistics, survey and test development and analysis, psychometrics and validation, industrial and organizational research, grant support, education measurement, and much more. CMG members have particular expertise in advanced statistics with proficiency utilizing techniques such as latent variable modeling, item response theory, survival analysis, hierarchical linear modeling, path analysis, and multiple imputation. In addition, CMG has had a consistent record working in applied settings including education, psychology, public health, medicine, economics and the social sciences.

Jason C. Cole, PhD as President and Jeff Dang, MPH as Vice President of CMG serve as the primary research scientists and lead a team of well qualified consultants who have an in depth and complementary set of skills. In fact, CMG's network of PhD level experts and specialists are able to provide the support and resources needed to complete even the most complex projects in a timely manner.

Mr. Robert Burt  
 Art Daniel  
 Proposed CDAC Standards

**APPENDIX K**  
**CERTIFICATION TEST COSTS AS DEVELOPED BY**  
**AGC OF TEXAS**

DESCRIPTION	ASSUMPTIONS	UNIT	ESTIMATED QUANTITIES	ESTIMATED UNIT COST	EXTENSION
CONSULTANT TO DEVELOP AN ACCREDITED CRANE OPERATOR CERTIFICATION PROGRAM	APPENDIX "A"	LUMP SUM	1	\$ 354,140.00	\$ 354,140.00
ANNUAL MAINTENANCE COST FROM CONSULTANT	APPENDIX "A"	YEARS	5	\$ 100,000.00	\$ 500,000.00
FACILITY AND PROCTORS FOR TESTING OF OPERATORS	20 OPERATORS PER TEST	EACH	750	\$ 250.00	\$ 187,500.00
TEST SUPPLIES FOR TESTING OF OPERATORS	1 PER OPERATOR	EACH	750	\$ 50.00	\$ 37,500.00
CRANES FOR PRACTICAL TESTING OF OPERATORS	3 CRANES PER TEST	HOURS	1,140	\$ 250.00	\$ 285,000.00
MOBILIZATION OF CRANES FOR PRACTICAL TESTING OF OPERATORS	3 EACH PER TEST PERIOD	MOVES	114	\$ 1,500.00	\$ 171,000.00
RETESTING OF OPERATORS	20 OPERATORS PER TEST	EACH	300	\$ 250.00	\$ 75,000.00
CRANES FOR PRACTICAL RETESTING OF OPERATORS	3 CRANES PER TEST	HOURS	450	\$ 250.00	\$ 112,500.00
MOBILIZATION OF CRANES FOR PRACTICAL TESTING OF OPERATORS	3 EACH PER TEST PERIOD	MOVES	45	\$ 1,500.00	\$ 67,500.00
<b>TOTAL</b>					<b>\$ 1,790,140.00</b>
<b>TESTING COST PER OPERATOR FOR FIRST 750 OPERATORS</b>		<b>EACH</b>	<b>750</b>		<b>\$ 2,386.85</b>

Mr. Robert Burt  
Art Daniel  
Proposed CDAC Standards

**APPENDIX L**

**TOTAL COST OF CERTIFICATION**

One Operator	\$ 6,151.59
Retesting	\$ 2,460.64
English Tutoring	\$ 21,687.29
Lost Income	\$ 86,040.00
Wage Escalation	\$ 151,110.69
	\$ 267,450.20
Six Operators	\$1,604,701.23
Cost per year Ammortized over 5 years	\$ 320,940.25

Mr. Robert Burt  
Art Daniel  
Proposed CDAC Standards

<sup>1</sup> C-DAC Consensus Document, August 5, 2004; Table of Contents.

<sup>2</sup> C-DAC Consensus Document, August 5, 2004.

<sup>3</sup> 1926.550 (a) – 1926.550 (g);

<sup>4</sup> [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10760](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760)

<sup>4</sup> [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10760](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760)

<sup>5</sup> C-DAC Consensus Document, August 5, 2004; Section 1423

<sup>6</sup> C-DAC Consensus Document, August 5, 2004

1. S 1402, (c) (1) "Ensure that...";
2. S 1402 (e) "...that person's employer shall have a discussion..."
3. S 1403 (b) "...the employer can demonstrate..."
4. S 1404 (a) (1) "...both a competent person and a qualified person..."
5. S 1404 (c) "...supervisor must review the applicable..."
6. S 1404 (d) (1) "...supervisor must determine..."
7. S 1404 (f) (2) "...employer demonstrates..."
8. S 1404 (h) "...must address..."
9. S 1404 (h) (11) "...must be considered..."
10. S 1404 (h) (12) "...must be considered..."
11. S 1404 (m) (1) (i) "...a registered professional engineer familiar with..."
12. S 1404 (m) (1) (i) "...must approve, in writing..."
13. S 1404 (m) (2) "...must be inspected to ensure compliance with paragraph ..."
14. S 1406 (a) "...employer shall ensure..."
15. S 1407 (a) "...employer must determine..."
16. S 1407 (a) (1) "Confirm from the utility owner/operator..."
17. S 1407 (a) (3) (i) "Determine..."
18. S 1407 (a) (3) (ii) "Determine..."
19. S 1407 (b) (1) "Conduct a planning meeting..."
20. S 1407 (c) "...employer has confirmed that the utility..."
21. S 1408 (a) (2) "Determine..."
22. S 1408 (a) (2) (i) "Confirm from..."
23. S 1408 (a) (2) (iii) (A) "Determine..."
24. S 1408 (a) (2) (iii) (B) "Determine..."
25. S 1408 (b) (1) "Conduct a planning meeting..."
26. S 1408 (d) (1) "...employer has confirmed..."
27. S 1408 (d) (2) "...employer demonstrates..."
28. S 1408 (d) (2) (iv) "The employer demonstrates..."
29. S 1408 (e) "...the utility owner/operator confirms..."
30. S 1408 (g) (1) "...shall be trained..."
31. S 1408 (g) (2) "...shall be trained..."
32. S 1408 Table 5 "...power line owner/operator or registered professional engineer who is a qualified person..."
33. S 1410 (a) "The employer determines..."
34. S 1410 (b) "The employer determines..."

- 
35. S 1410 (c) (1) "...power line owner/operator or registered professional engineer who is a qualified person..."
  36. S 1410 (d) "A planning meeting ..."
  37. S 1410 (d) (1) "...must be made inoperative..."
  38. S 1410 (d) (9) "...must be prohibited from..."
  39. S 1410 (e) "The procedures developed..."
  40. S 1410 (f) "...crane user and utility owner/operator meet with the crane operator..."
  41. S 1410 (h) "...shall identify one person..."
  42. S 1411 (b) "...employer shall ensure..."
  43. S 1411 (b) (3) "...employer shall ensure..."
  44. S 1412 (a) (1) "...shall be inspected by a qualified person..."
  45. S 1412. (a) (1) (i) "...shall ensure...with the approval obtained..."
  46. S 1412 (b) (1) "...shall be inspected by a qualified..."
  47. S 1412 (b) (1) (i) ...qualified person shall determine..."
  48. S 1412 (b) (1) (ii) (A) "...the employer shall ensure that..."
  49. S 1412 (b) (1) (ii) (B) "Determine if..."
  50. S 1412 (c) (1) "...shall be inspected by a qualified person..."
  51. S 1412 (c) (2) (i) "Determine if..."
  52. S 1412 (c) (2) (i) "...ensure that the are developed by an RPE."
  53. S 1412 (c) (2) (ii) "Determine if the equipment..."
  54. S 1412 (d) (1) "A competent person shall begin a visual inspection..."
  55. S 1412 (d) (2) "...an immediate determination shall be made..."
  56. S 1412 (e) (3) (i) "...shall be documented..."
  57. S 1412 (e) (3) (ii) "...shall be retained..."
  58. S 1412 (f) (1) "...shall be inspected..."
  59. S 1412 (f) (4) "...an immediate determination..."
  60. S 1412 (f) (6) "If the qualified person..."
  61. S 1412 (f) (7) "Documentation of annual/comprehensive..."
  62. S 1412 (g) "...a qualified person shall..."
  63. S 1412 (h) "...inspected by a qualified person in accordance..."
  64. S 1413 (a) (1) "...competent person shall begin..."
  65. S 1413 (a) (3) "...competent person shall..."
  66. S 1413 (a) (4) "...immediate determination shall be made by the competent person..."
  67. S 1413 (a) (4) (iii) (A) "...a qualified person..."
  68. S 1413 (a) (4) (iii) (B) "...a qualified person..."
  69. S 1413 (a) (4) (iii) (C) "...a qualified person..."
  70. S 1413 (a) (4) (iii) (D) "...a qualified person..."
  71. S 1413 (a) (4) (iii) (E) "...shift inspections are informed..."
  72. S 1413 (c) (1) "...shall be inspected by a qualified person..."
  73. S 1413 (c) (2) "...shall be inspected by a qualified person..."
  74. S 1413 (c) (3) (ii) "...employer shall ensure..."
  75. S 1414 (a) "...shall be in accordance..."

76. S 1414 (c) (3) (i) "A qualified person shall inspect..."
77. S 1414 (c) (3) (iii) "...shall be recorded monthly..."
78. S 1416 (e) "If the employer documents..."
79. S 1417 (c) (1) "...shall be readily available..."
80. S 1417 (e) (1) (iii) "...competent person determines..."
81. S 1417 (e) (1) (iv) "...competent person shall determine..."
82. S 1417 (j) "...designated by the employer to receive..."
83. S 1417 (n) "...competent person shall consider..."
84. S 1417 (u) (2) (i) "...competent person supervises..."
85. S 1419 (c) (2) "...signal person, crane operator, and lift supervisor shall contact each other prior to operation and agree on..."
86. S 1419 (d) "...employer demonstrates..."
87. S 1421 (1) "Prior to beginning operations, the crane operator, signal person, and lift supervisor (if there is one), shall contact each other and agree on..."
88. S 1423 (e) "...employer shall provide and ensure..."
89. S 1423 (h) (1) "...qualified person has determined..."
90. S 1424 (a) (2) (i) "Instruct employees assigned..."
91. S 1424 (b) "...controlling entity shall institute a system..."
92. S 1425 (c) (3) "...a qualified rigger..."
93. S 1427 (a) "...employer must ensure..."
94. S 1427 (c) (1) (ii) "Approved by an auditor..."
95. S 1427 (c) (2) (ii) "...auditor shall be certified..."
96. S 1427 (c) (5) "...employer shall ensure..."
97. S 1427 (f) (2) (i) "...shall be provided with sufficient training prior to..."
98. S 1427 (k) (ii) "...shall be provided with sufficient training..."
99. S 1427 (k) (ii) "...employer shall ensure..."
100. S 1428 (a) "...employer of the signal person shall ensure..."
101. S 1428 (a) (1) "...signal person has documentation from a third party..."
102. S 1428 (a) (1) "...qualified evaluator..."
103. S 1428 (a) (2) "...qualified evaluator..."
104. S 1430 "...employer shall provide training..."
105. S 1430 (c) (1) "Retraining shall be provided..."
106. S 1430 (c) (2) "...operators shall be trained..."
107. S 1430 (d) "...shall be trained..."
108. S 1430 (e) "...shall be instructed..."
109. S 1430 (g) (1) "...employer shall ensure that employees required to be trained under this Subpart are evaluated..."
110. S 1430 (g) (2) "Refresher training in relevant topics shall be provided..."
111. S 1431 (a) "...employer demonstrates that..."
112. S 1431 (d) (2) "...rated capacity..."
113. S 1431 (g) (4) "...competent person..."
114. S 1431 (g) (4) (i) "Conduct a visual inspection..."

- 115.S 1431 (j) (1) "...shall be proof tested to..."
- 116.S 1431 (j) (3) "...a competent person shall inspect..."
- 117.S 1431 (k) (8) (i) "...a qualified person shall determine..."
- 118.S 1431 (k) (8) (ii) "...a qualified person shall determine..."
- 119.S 1431 (k) (12) (i) (B) "...employer demonstrates..."
- 120.S 1432 (a) "...the operation must be planned..."
- 121.S 1432 (a) (1) "...a qualified person..."
- 122.S 1432 (a) (3) "...engineering expertise is needed for the planning, the employer must ensure..."
- 123.S 1432 (b) (1) "...supervised by a person that meets the criteria for both a competent person and a qualified person..."
- 124.S 1432 (b) (2) "...supervisor must review the plan..."
- 125.S 1433 (e) (4) (ii) (A) "...qualified person has determined..."
- 126.S 1434 (a) (2) (i) "...registered professional engineer who is a qualified person..."
- 127.S 1434 (a) (2) (i) (A) "Approves the modification/addition..."
- 128.S 1435 (b) (2) "...competent person in charge indicates..."
- 129.S 1435 (b) (3) (i) "...be designed by the manufacturer or a registered professional engineer..."
- 130.S 1435 (b) (3) (iii) "...speed determined by a qualified engineer..."
- 131.S 1435 (b) (4) "...a registered professional engineer...must approve in writing..."
- 132.S 1435 (b) (5) "...verified by a qualified person..."
- 133.S 1435 (b) (7) (ii) "...registered professional engineer verify..."
- 134.S 1435 (b) (7) (iii) "...determined by a qualified person..."
- 135.S 1435 (b) (8) (i) "...specified by the manufacturer or a professional engineer..."
- 136.S 1435 (d) (3) "...where the employer meets..."
- 137.S 1435 (d) (6) "...employer documents..."
- 138.S 1435 (d) (6) (v) "...qualified person estimates..."
- 139.S 1436 (e) (2) (ii) "...employer shall ensure..."
- 140.S 1436 (g) (3) "...shall be load tested by a competent person..."
- 141.S 1436 (g) (4) "Tests conducted under this paragraph shall be documented"
- 142.S 1436 (o) "...supervised by a competent person"
- 143.S 1437 (e) (4) "A competent person shall determine..."
- 144.S 1437 (h) "...employer shall ensure that..."
- 145.S 1437 (h) (4) (i) "...inspected annually by a qualified person..."
- 146.S 1437 (h) (4) (iv) "...qualified person determines..."
- 147.S 1437 (h) (5) (i) "...shall be surveyed...by a marine engineer, marine architect, licensed surveyor, or other qualified person..."
- 148.S 1437 (m) (4) "...employer has documents demonstrating..."
- 149.S 1437 (m) (4) "...signed by a registered professional engineer..."
- 150.S 1437 (n) (3) (ii) "...amount specified by the qualified person..."
- 151.S 1437 (n) (5) "...employer shall meet..."
- 152.S 1437 (n) (4) (v) "...shall be designed by a marine engineer..."
- 153.S 1437 (n) (4) (vi) (A) "Marine engineer or registered professional engineer..."
- 154.S 1440 (c) (1) "...employer shall comply with all manufacturer procedures..."

<sup>7</sup> 1926.550 (a) – 1926.550 (g)

1. S 1926.550 (a) (1) "...employer shall comply with the manufacturer's specifications..."
2. S 1926.550 (a) (1) "...determinations of a qualified engineer..."
3. S 1926.550 (a) (6) "...shall be made by a competent person..."
4. S 1926.550 (a) (11) "...shall be made and recorded..."
5. S 1926.550 (a) (15) (vi) "...authorities indicate that it is..."
6. S 1926.550 (a) (15) (vii) "...tests shall be made..."
7. S 1926.550 (b) (2) "...employer shall prepare a certification record..."
8. S 1926.550 (f) (3) "...employer shall comply with the applicable..."
9. S 1926.550 (g) (4) (ii) (A) "...shall be designed by a qualified engineer or a qualified person..."
10. S 1926.550 (g) (4) (ii) (H) "...performed by a qualified welder..."
11. S 1926.550 (g) (5) "...trial lift shall be performed..."
12. S 1926.550 (g) (7) (i) "...employer demonstrates..."
13. S 1926.550 (g) (7) (ii) "...employer shall implement..."
14. S 1926.550 (g) (8) (i) "A meeting attended by the crane or derrick operator, signal persons... employees to be lifted, and the person responsible..."

<sup>8</sup> American Society of Mechanical Engineers, ASME B30.5-2000, page 33.

<sup>9</sup> <http://pacific.bizjournals.com/pacific/stories/2003/10/06/story1.html?page=3>

<sup>10</sup> Appendix A

<sup>11</sup> OSHA's Preliminary Initial Regulatory Flexibility Analysis (PIRFA), page 20.

<sup>12</sup> Appendix C

<sup>13</sup> Appendix D

<sup>14</sup> Appendix D

<sup>15</sup> 1996.550 (a) (5)

<sup>16</sup> <http://pacific.bizjournals.com/pacific/stories/2005/10/24/story1.html?page=2>

<sup>17</sup> Appendix E

<sup>18</sup> <http://pacific.bizjournals.com/pacific/stories/2005/10/24/story1.html?page=2>

<sup>19</sup> Appendix E

<sup>20</sup> Appendix I

<sup>21</sup> Verbacom

**Verbacom (Irene Zucker)**

English as a Second Language (Tailored for Crane Certification)

English 101: Course Development                      \$18,000

English 102: Course Development                      \$20,000

For small company    **\$38,000 plus**

Plus \$500 per person for each course

(trainer and materials, etc.)

Hours per week:                      16 (4 hours per day for 4 days)

Weeks per course                      6

Mr. Robert Burt  
Art Daniel  
Proposed CDAC Standards

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<sup>22</sup> Appendix B

<sup>23</sup> Appendix L

<sup>24</sup> Appendix H

<sup>25</sup> <http://www.nccco.org/training/index.html>

<sup>26</sup> Appendix F

<sup>27</sup> C-DAC Consensus Document, August 5, 2004, page 101

<sup>28</sup> Appendix J

<sup>29</sup> Appendix K

**Howard Pebley  
McAllen Construction**

# McALLEN CONSTRUCTION, INC.

P.O. Box 3244 • McAllen, Texas 78502 • Phone: (956) 686-7819 • Fax: (956) 686-7824

September 7, 2006

U.S. Department of Labor  
Occupational Safety and Health Administration  
Attn: Robert Burt  
Chair, Small Business Advocacy Review Panel  
200 Constitution Ave, N.W.  
Washington, D.C. 20210

Re: SBREFA Panel Comments  
Proposed Crane and Derricks Standard

Dear Mr. Burt:

As requested, please find enclosed my comments concerning the proposed crane and derrick standards. The cost information requested was compiled using our in house corporate information as well as industry compiled data. Some of the cost information that was requested is estimation only, we do not collect some of the data required to substantiate your request.

My comments will try to follow issues that where supplied by OSHA.

Yours truly,



Howard T. Pebley Jr.  
President



Raising Quality Through Continuous Improvement

A. General:

1. Could changes be made to make the draft proposed standard easier to understand? Are there any specific types of information that OSHA could provide to help employers in this regard?

The draft regulations are lengthy and are not written in layman's language. All the references to past and future sections also make it difficult to maintain a coherent thought. This contributes to my decision that if the regulations are adopted as currently proposed, McAllen Construction will be forced to hire a professional to comply fully with the proposed regulations.

2. Does the proposed standard include provisions for which compliance may be difficult which would be improved while maintaining employee protection?

The operator certification proposal could be replaced with an employer qualification and training program that will produce trained operators to fill the requirements of the specific operations the employee will be performing and the equipment that the employee will be operating. This would allow for much more focused training and improve workforce safety while greatly increasing efficient utilization of small business assets.

3. Would any of the proposed requirements cause you to significantly change the way you or others in your industry do things, and what effect would such changes have in terms of time, money, and safety? Please explain and support your conclusions with specific information or examples, if possible.

Operator certification as now written will require McAllen Construction to replace at least 75% of its current crane operators due to literacy and language issues. At this time I cannot find any crane operators to hire under the current requirements. We have prepared our estimation of the cost to McAllen Construction to be in compliance with the proposed regulations. This estimate is based upon being able to certify our 9 current operators. (See Appendix A)

All the proposed documentation, inspections, and engineering review will require McAllen Construction to hire an additional supervisor exclusively for our crane fleet, at an estimated cost of between \$80,000.00 and \$100,000.00 per year. Based on McAllen Construction's current safety record, I see no improvement in safety only more documentation.

## B. Ground Conditions:

1. Who typically takes care of correcting insufficient ground conditions? When ground conditions are unsuitable for setting up a crane, do you have problems getting them corrected?

McAllen Construction self performs its crane work and provides their own operators; therefore, McAllen Construction is responsible for the ground conditions on its projects.

2. OSHA estimates that the new regulation would add 30 minutes of a supervisor's time to assure adequate site assessment. How much time do you spend on site assessment now and who is responsible for it?

Every site is different and therefore no meaningful estimated cost can be given as to what site preparation may costs. This cost is part of McAllen Construction normal operations. The project supervisor is responsible for the initial site assessment and if in his judgment more analysis is required he will escalate the issue to our managerial staff.

## C. Assembly/Disassembly

1. Who normally supervises the assembly/disassembly process?

The operator and project supervisor are responsible for assembly and disassembly of our equipment.

2. Do you always follow the manufacturer's instructions for assembly and disassembly?

The equipment that McAllen Construction owns does not have instruction manuals available. McAllen Construction trains all operators on how to assemble and disassemble its cranes.

#### D. Power Line Safety

1. In how many jobs does your company work closer than 20 feet to power lines? How many days of the job typically involve working closer than 20 feet to power lines? How many jobs does your company do that require working within 10 feet of a power line? How many days of the job typically require working within 10 feet of a power line?

I cannot begin to answer all the questions listed above. I will say that McAllen Construction works in urban as well as rural areas and our personnel deal with overhead as well as underground power lines on a daily bases.

2. What precautions does your company take to ensure that the minimum allowable clearance from a power line is maintained? Does your company follow the power line safety requirements set forth in the current ANSI standard (B30.5)

McAllen Construction uses various methods depending on the site conditions and project requirements. The most common methods are to use a spotter or to delineate the distance from the power line.

3. If your company works closer than 10 feet to power lines, what precautions does your company take to ensure employee safety?

The power line will either be de-energized or relocated until the project is completed.

4. OSHA's estimate of the costs of various power line safety measures are given on pages 25 to 28 of PIRFA. Can you improve on these estimates?

All of this analysis is just part of our personnel doing their normal job and McAllen Construction does not capture that cost. I cannot respond to this question due to the fact that everything in the analysis is supposition.

### E. Inspections

1. The draft proposed standard would require inspections at intervals (shift, monthly and annual), and following certain activities (equipment modification, repair/adjustment, severe service, equipment not in regular use). To what extent is you company already performing similar inspections? What inspections do you currently perform?

McAllen Construction currently performs many of the inspections that are included in the proposed regulations. The major difference between our current procedures and the proposed regulation is the documentation requirements.

### F. Fall Protection

1. What fall protection measures does your company currently use to ensure employees safety when on walking/working surface of a crane? Does your company require the use of fall protection equipment? If so, when?

McAllen Construction requires fall protection as per the current OSHA Fall Protection regulations. Equipment is equipped with fall protection devices some factory installed and some added by McAllen Construction. McAllen Construction has no crane booms with walkways.

### G. Operator Certification/Qualification:

1. How does your company assess whether an operator is competent to operate a particular crane/derrick? Do you have your own assessment procedure, or do you have the operators certified by a testing organization?

McAllen Construction trains its operators using a training program provided by Texas A&M University on our site using our cranes. The professional instructor provides McAllen Construction with an assessment of the skill level of each trainee on specific cranes.

2. How many crane/derrick operators do you currently employ?

McAllen Construction owns and operates 9 cranes of various sizes and types.

3. In its preliminary cost estimates, OSHA estimated that certifying a crane operator would require 2 days of a crane operator's time, plus \$500 per operator for training costs, and \$250 for the test itself. This estimate includes time for review and test preparation, as well as the time required to take the test. Could this estimate be improved?

Yes, see Appendix A

#### H. Signal Person Qualification:

2. Do you currently train and test signal persons?

McAllen Construction trains their signal personnel using the Texas A&M University Rigger Training Program.

#### I. Cost and Economics:

1. How many jobs do you do in the typical year that require crane or derricks? On the average, how long is the crane or derrick on site?

McAllen Construction completes approximately 20 to 30 Projects per year. McAllen Construction owns and operates its cranes on these projects. The cranes typically are on the project thru the duration of the project depending on the type of project. A better assessment of crane usage would be days used per year. I estimate that the 9 cranes result in 800 days of usage per year by McAllen Construction.

2. How many crane/derricks do you own? Do you rent out these cranes or derricks?

McAllen Construction owns 9 cranes and does not rent its cranes.

3. Do you rent crane or derricks from others? Do you provide your own operators or rent the crane with an operator? How many times a year do you rent a crane or derrick from others?

McAllen Construction rents cranes with operators, from commercial crane rental companies, approximately 5 times per year.

4. How many crane operators do you employ? What is the annual turnover in crane operators?

We currently employ 9 crane operators and for the last five years have only lost one operator.

5. Please review and provide comments on the specific unit estimates used by OSHA to determine costs and impacts associated with the draft proposed standard, as summarized in Table 7. Note that costs are calculated only for the proposed requirements not already required by the existing standard.

McAllen Construction provides its cost analysis in Appendix A. Due to, the vagueness of the data presented in the PIRFA document I cannot comment on the analysis offered by OSHA.

## J Alternatives:

1. Pages 32-35 of the Preliminary Initial Regulatory Flexibility Analysis (PIRFA) describes several alternatives to the draft proposed standard that were considered by OSHA and the Cranes and Derricks Negotiated Rule making Advisory Committee (C\_DAC). These pages also contain C-DAC's and OSHA's rationale for not adopting the alternatives. We would appreciate your ideas on these and any other alternatives you believe OSAH should consider. While the Panel actively encourages you to think about a full range of alternatives to the draft proposal, please bear in mind that any alternatives selected must fully protect employee safety.

McAllen Construction would benefit from more focused and frequent training for its crane operators. Regulations that delineate training level and frequency, which address the employer's specific requirements, would do much more to enhance worker safety and provide for greater utilization of small business assets than the current proposed regulations. The proposed regulations only require re-certification on a 5 - year cycle and do not address employee health and life style problems, which in my opinion is not adequate.

2. Are there differences in small business practice such that small businesses could be exempted from any portion of the draft proposed standard without the loss of worker protection (please explain your answer)?

The proposed regulations are too broad. The training level as specified is not required for many operations that are preformed by small business on a daily basis.

K. Documentation:

1. The OSHA draft proposed standard contains record keeping requirements including documenting certain inspections, deficiencies in audited employer qualification programs (1427), signal person qualifications (1428), post-assembly testing of new or reinstalled derricks (1436), and part replacement orders relative to operational aids (1416).

McAllen Construction currently keeps documentation of employee craft and safety training, drug testing, health physicals, equipment inspections and repairs, safety violations and near misses. All parts are ordered using a purchase order system to document and track replacement orders. The additional cost of documentation will be incurred because all this documentation will have to be organized to comply with the proposed regulation and will not enhance worker safety in any way.

## Appendix A Cost of Certification

Item	Unit Type	Units	Unit Cost	Extended Cost
<b>English Proficiency Training (Appendix B)</b>				
Course Development	EA	1	\$ 4,000.00	\$ 4,000.00
Tuition	EA	1	\$ 1,000.00	\$ 1,000.00
Operator Wages	Hour	96	\$ 28.13	\$ 2,700.72
Lost Sales due to Lost Production	Days	12	\$ 4,816.10	\$ 57,793.16
<b>English Proficiency Training Total</b>				<b>\$ 65,493.88</b>
<b>Certification Preparation Training</b>				
Crane Training Class	EA	1	\$ 1,600.00	\$ 1,600.00
Operator Wages - Training	Hour	30	\$ 28.13	\$ 843.98
Operator Wages - Travel	Hour	20	\$ 28.13	\$ 562.65
Travel Costs	Mile	824	\$ 0.44	\$ 362.56
Per Diem	Days	3	\$ 100.00	\$ 300.00
Lost Sales due to Lost Production	Days	5	\$ 4,816.10	\$ 24,080.48
<b>Crane Training Class Total</b>				<b>\$ 27,749.67</b>
<b>Crane Testing</b>				
Testing Fees	EA	1	\$ 695.00	\$ 695.00
Operator Wages - Written Test	Hour	10	\$ 28.13	\$ 281.33
Operator Wages - Practical Test	Hour	10	\$ 28.13	\$ 281.33
Operator Wages - Travel	Hour	20	\$ 28.13	\$ 562.65
Travel Costs	Mile	824	\$ 0.44	\$ 362.56
Per Diem	Days	2	\$ 100.00	\$ 200.00
Lost Sales due to Lost Production	Days	4	\$ 4,816.10	\$ 19,264.39
<b>Crane Testing Total</b>				<b>\$ 21,647.25</b>
<b>Total Cost per Operator for Initial Certification</b>				<b>\$ 114,890.79</b>

**Total to Certify 9 Operators** **\$ 1,034,017.12**

### Retesting Costs

Passing rate	50%
Operators	9
Passing Operators	4.5
Failing operators to be retested	4.5
Retesting Costs per Operator	\$49,396.91

**Total Retesting Cost** **\$ 222,286.11**

**TOTAL COST to Certify 9 Operators** **\$ 1,256,303.23**

**Amortized Annual Cost of Initial Certification over 5 Years** **\$ 251,260.65**

**Ongoing Costs Every 5 Years for 9 Operators** **\$ 444,572.22**

**Amortized Annual Cost of Certification over 5 Years** **\$ 1,088,914.44**

## Lost Sales Projection

Hourly Crew Labor Rates			Extended Rate	
Classification	Quantity	Rate	Per Hour	
Supervisor	1	\$ 31.00	\$	31.00
Operator	3	\$ 28.13	\$	84.40
Utility Laborer	2	\$ 18.76	\$	37.51
Common Laborer	2	\$ 15.94	\$	31.88
<b>Total Hourly Labor Rate</b>			\$	<b>184.79</b>

Hourly Crew Equipment Rates			Extended Rate	
Equipment	Quantity	Rate	Per Hour	
Crane	1	\$ 113.00	\$	113.00
Excavator	1	\$ 82.00	\$	82.00
Loader	1	\$ 39.00	\$	39.00
<b>Total Hourly Equipment Rate</b>			\$	<b>234.00</b>

**Total Hourly Crew Rate** \$ **418.79**

**Daily Crew Rate Assuming 10 Hour Day** \$ **4,187.91**

### Days of Lost Production for Certification and Testing (Per Operator)

English Proficiency Training	12
Crane Certification Training	3
Crane Certification Testing	2
Travel Days	4
<b>Total Lost Days per Operator</b>	<b>21</b>

**Total Lost Days for 9 Operators** **189**

**Total Crew Costs Based on 189 Lost Days** \$ **791,514.99**

**Total Lost Sales based on 15% Profit Margin** \$ **910,242.24**

**Lost Sales due to Lost Production per Day** \$ **4,816.10**

**Appendix B**  
**English Proficiency Training Quote**

**Verbacom**  
Irene Tucker

English as a Second Language (tailored for Crane Certification testing)

**Direct Course Costs:**

English 101: Course Development	\$18,000
English 102: Course Development	\$20,000

<b>Total Course Development</b>	<b>\$38,000</b>
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Tuition per person per course	\$500
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**Training Time Requirements:**

Hours per week: 16 (4 hours per day for 4 days)

Weeks per course: 6

Total Hours of Training: 96

**Rick Burgett**  
**Rebcon, Inc**

# REBCON, INC.

September 7, 2006

U.S. Department of Labor  
Occupational Safety and Health Administration  
Attn: Robert Burt  
Chair, Small Business Advocacy Review Panel  
Washington, D.C. 20210

Re: SBREFA Panel Comments  
Proposed Crane and Derricks Standard

Dear Mr. Burt:

Thank you for the opportunity to provide input on OSHA's draft of the Cranes and Derricks in Construction rule. I hope I can add prospective from a small business and highway contractor's point of view. Safety and the well being of our employees is a major focus of our business and my hope is that my comments will help edit this draft to make it more understandable, useable, and financially viable.

I have followed the OSHA format for my remarks.

Yours truly,

  
R. E. Burgett  
President

1868 W. NORTHWEST HWY. DALLAS, TEXAS 75220 972/444-8230

A. General:

1. Could changes be made to make the draft proposed standard easier to understand? Are there any specific types of information that OSHA could provide to help employers in this regard?

The document is too long. OSHA has attempted to create a specific document for every crane use. There are too many cranes types and applications to do this successfully. The old standard presented a broad stroke which could be applied to all cranes. The attempt in the new document to cover so much detailed information often makes it a difficult document to understand and to apply. This is not a document that would encourage anyone to read it. This means that it will only be perused when forced upon someone. That will usually happen in a law suit by a personal injury attorney.

Much of the document addresses maintenance issues which could be covered by referencing manufacturer's specifications.

The document spreads accountable responsibility to a supervisor or employer to determine substantially more detailed safety issues. This will require new and extensive documentation. This will add costs to every crane use. This will also allow more ammunition for lawyers to use if there is a failure to have complete or proper paperwork.

2. Does the proposed standard include provisions for which compliance may be difficult which would be improved while maintaining employee protection?

I think the proposed provisions will be costly and disruptive to the business. An employer qualification and training program should be allowed in lieu of certification by others. I feel such a program can produce trained operators who know our company's operations and methods of our equipment usage. It will also familiarize the employee with the actual equipment they will be operating.

3. Would any of the proposed requirements cause you to significantly change the way you or others in your industry do things, and what effect would such changes have in terms of time, money, and safety? Please explain and support your conclusions with specific information or examples, if possible.

I am very concerned about the possible costs involved and the potential changes to our business as it currently operates. In Texas we are a predominantly Hispanic workforce. We would anticipate a loss in operators throughout the state, not based not on ability to operate but based on a language barrier. The same may be said for the learning disabled. The average construction employee has an eighth grade education. Construction, i.e. working with their hands, is often the only field in which they can be successful. They may be good operators but poor test takers. Again an employer training program can be customized to provide the necessary tools to make our operators qualified.

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## B. Ground Conditions:

1. Who typically takes care of correcting insufficient ground conditions?  
When ground conditions are unsuitable for setting up a crane, do you have problems getting them corrected?

Our project engineers or superintendents are responsible for site inspection and ground conditions. The operator provides the final examination and approval of the set up and safety of the situation.

2. OSHA estimates that the new regulation would add 30 minutes of a supervisor's time to assure adequate site assessment. How much time do you spend on site assessment now and who is responsible for it?

I think OSHA has created a potential need to document almost every lift. This could require hours of time not thirty minutes. Our company uses a crane as a support piece of machinery. It lifts forms, rebar, tools, and concrete buckets. Most of the time the machines are used at ten to twenty percent of their lifting capacity therefore ground stability requirements are reduced and site assessment requirements can often be visual inspection. For heavy lifts, which I think the proposed OSHA document considers every lift, we spend substantial time planning and preparing. I am afraid we may need to hire an additional individual to do this documentation. This cost with all benefits, taxes, etc could easily exceed \$100,000 per year. The lost time of production for the operators to participate in these site examinations and inspections and their associated documentation could exceed another hour per operator per day. This time also means no production is occurring. The costs associated for these delays are difficult to assess based of the project and its specific requirements. These costs could be more hundreds of thousands of dollars per year. For a Small Business with only a few cranes this would be a prohibitive cost.

## C. Assembly/Disassembly

1. Who normally supervises the assembly/disassembly process?

The operator, a mechanic, and a project supervisor are responsible for assembly and disassembly of our equipment.

2. Do you always follow the manufacturer's instructions for assembly and disassembly?

Our 1965 Link Belt was sold this week. One reason was we did not own and could not get manufacturer's manuals. The crane will go out of the country where it will probably work another twenty or more years. Often the operator and mechanic who have worked with the machine many years are competent in assembly and disassembly without manufacturer's instructions.

#### D. Power Line Safety

1. In how many jobs does your company work closer than 20 feet to power lines? How many days of the job typically involve working closer than 20 feet to power lines? How many jobs does your company do that require working within 10 feet of a power line? How many days of the job typically require working within 10 feet of a power line?

There is great variation in power line situations. This year we have had no power line conflicts but other years we have had three or four in a year. Over twenty years we have only been within ten feet once and the power company was able to cut the power during the construction time. Other equipment, such as concrete pumps, has allowed alternatives so no equipment gets close to power lines.

2. What precautions does your company take to ensure that the minimum allowable clearance from a power line is maintained? Does your company follow the power line safety requirements set forth in the current ANSI standard (B30.5)

Power line safety requires training of personnel in awareness and procedure. Safety personnel are on site full time when work will be performed around a power line. All procedures are reviewed and followed throughout the construction.

3. If your company works closer than 10 feet to power lines, what precautions does your company take to ensure employee safety?

We will have the power line de-energized or, if not possible, relocated to allow for construction.

4. OSHA's estimate of the costs of various power line safety measures are given on pages 25 to 28 of PIRFA. Can you improve on these estimates?

OSHA has failed to recognize the logistics of a power line situation. Meetings are held, planning done, and preparations made. Often the

utility company adds additional costs through delays. The cost of this preparation is substantial and not accounted for by OSHA. Each job is specific and it would be irresponsible to generalize on the costs to do this work.

### E. Inspections

1. The draft proposed standard would require inspections at intervals (shift, monthly and annual), and following certain activities (equipment modification, repair/adjustment, severe service, equipment not in regular use). To what extent is your company already performing similar inspections? What inspections do you currently perform?

We currently perform many of the inspections called for by the draft. I feel the biggest change is the requirement for additional documentation which means additional cost and administration.

### F. Fall Protection

1. What fall protection measures does your company currently use to ensure employees safety when on walking/working surface of a crane? Does your company require the use of fall protection equipment? If so, when?

None of our cranes has fall protection on the booms. We do have fall protection on the working and walking surfaces of our cranes. We do require fall protection equipment where applicable on our projects.

### G. Operator Certification/Qualification:

1. How does your company assess whether an operator is competent to operate a particular crane/derrick? Do you have your own assessment procedure, or do you have the operators certified by a testing organization?

In our company the cranes operators are always the best operators. Typically they have operated almost every other piece of equipment for many years before they learn to operate a crane. Almost always they are over forty years old and have the maturity to have good judgment. Our company is twenty one years old and over half the employees have been with us over twelve years. The assessment of who is responsible and who is capable is easy when you know the

employees as well as we do. We do not have certified operators but we have qualified and capable operators.

2. How many crane/derrick operators do you currently employ?

We have two crane operators and two qualified operators who can operate if necessary.

3. In its preliminary cost estimates, OSHA estimated that certifying a crane operator would require 2 days of a crane operator's time, plus \$500 per operator for training costs, and \$250 for the test itself. This estimate includes time for review and test preparation, as well as the time required to take the test. Could this estimate be improved?

Yes, it is far too low. OSHA is proposing a sole source certifier and has not factored in the cost of travel, lodging, lost time wages and benefits, and the additional days of travel. There are also costs for the loss of the operator on the projects and the replacement costs for that hiring a fill in operator. Test preparation costs will be substantially more especially if language or learning disabilities exist. In my opinion OSHA is estimating only a small fraction of the true costs. Someone who has never run a business, recognized a business disruption, or hired an individual dreamed these numbers up.

#### H. Signal Person Qualification:

2. Do you currently train and test signal persons?

Yes.

#### I. Cost and Economics:

1. How many jobs do you do in the typical year that require crane or derricks? On the average, how long is the crane or derrick on site?

We construct approximately fifteen to twenty projects per year. A crane is required on less than half of our work. The machine could be on site the length of the job or only for a few weeks. Every job has a different make up.

2. How many crane/derricks do you own? Do you rent out these cranes or derricks?

We currently own four cranes. We sold one crane last week and will sell two more in the near future.

3. Do you rent crane or derricks from others? Do you provide your own operators or rent the crane with an operator? How many times a year do you rent a crane or derrick from others?

We rent cranes for all heavy lifts. These cranes are supplied with their own operators. We will rent approximately twelve to fifteen times per year.

4. How many crane operators do you employ? What is the annual turnover in crane operators?

We currently have two crane operators and two qualified operators who can operate if necessary. We have long term employees and have not experienced turnover. This could change if operators who are certified are offered substantially higher wages to go to another company. This apparently is happening in California where crane operator wages have spiked and turnover is high due to their certification requirements.

5. Please review and provide comments on the specific unit estimates used by OSHA to determine costs and impacts associated with the draft proposed standard, as summarized in Table 7. Note that costs are calculated only for the proposed requirements not already required by the existing standard.

The assumptions in this chart are without foundation and are pure speculation. There is no merit or validity to the information presented. Each project that we construct is as different as the personalities of individuals. There could be no possible way to determine cost without assessing each specific situation. One of my professors in engineering school said that to assume meant to make "an ASS out of yoU and ME". This chart makes a good run at doing that.

J Alternatives:

1. Pages 32-35 of the Preliminary Initial Regulatory Flexibility Analysis (PIRFA) describes several alternatives to the draft proposed standard that were considered by OSHA and the Cranes and Derricks Negotiated Rule making Advisory Committee (C\_DAC). These pages also contain C-DAC's and OSHA's rationale for not adopting the alternatives. We would appreciate your ideas on these and any other alternatives you believe OSAH should consider. While the Panel actively encourages you to think about a full range of alternatives to the draft proposal, please bear in mind that any alternatives selected must fully protect employee safety.
2. Are there differences in small business practice such that small businesses could be exempted from any portion of the draft proposed standard without the loss of worker protection (please explain your answer)?

The difference may be the relationship between the employer and the employee. Management in our company knows every employee and their skills and abilities. A larger company may not have that perspective. We hope that OSHA will decide for all companies to move away from certification and emphasis training and qualification.

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## K. Documentation:

1. The OSHA draft proposed standard contains record keeping requirements including documenting certain inspections, deficiencies in audited employer qualification programs (1427), signal person qualifications (1428), post-assembly testing of new or reinstalled derricks (1436), and part replacement orders relative to operational aids (1416).

Our company already complies with many of the record keeping requirements. We keep personnel files which document training, safety record, drug testing, and other employee information and history. We keep maintenance records on each piece of equipment documenting repairs and upkeep. We do not currently keep documentation of daily site conditions for each crane or daily inspections of each crane. We sometimes move a crane twenty times in one day and we do not record the ground condition for each move. The documentation for this proposed standard will require substantial additional administration and added cost.

## SUMMARY

1. The document is too cumbersome and tries to be too detailed which creates ambiguities and opportunities for legal exposure.
  2. The implied additional administrative costs could be devastating to small businesses and could end their use of owned cranes.
  3. No provisions are included in the certification process for the learning disabled.
  4. No provisions are included in the certification process for the non English speaking employees.
  5. A sole source accreditation organization will be a monopoly that will add substantial cost to certification.
  6. Employer organized training and qualification programs should replace the proposed certification.
  7. New administrative costs and certification costs will damage small businesses the most because those costs will be distributed over a much smaller gross sales amount.
-

Thank you again for allowing me to comment on this proposed standard. I think these changes are being supported by a certifying agency and the rental cranes companies who will both benefit financially from the implementation of this standard. My company, in twenty one years of business, has never had an accident involving a crane. So for my company the old standard proved to be sufficient. Market forces such as insurance costs and personal injury litigation have been and will always be more influential on safety improvements than this document. Unfortunately the added costs of administering the document will make the United States continue to slide in its ability to compete. The global economy no longer cares if the factory is built in the U.S. or China. We are losing our manufacturing facilities at increasing rates and costly proposed changes like this new standard will only increase our downturn.

If OSHA could guarantee additional lives saved I would agree this is a good thing, but OSHA is only speculating this will happen. Millions of new drivers are certified by receiving a license every year, yet the death toll on our highways continues to be huge. As employers we have not only the business need to be safe but the moral responsibility to provide a safe environment for our employees. I think most companies today are working hard to achieve those goals. I hope OSHA will rethink their position on this standard.

Yours truly,

  
R. E. (Rick) Burgett  
President

**George S. Young**  
**George Young Company**

# George YOUNG Company



**RIGGING** ● **MILLWRIGHTING** ● **HAULING**  
20<sup>th</sup> Street and Oregon Avenue Phila., PA 19145-4296 (215) 467-5315

Kathy Martinez  
SBREFA Coordinator

Dear Ms. Martinez,

Thank you for the opportunity to provide input regarding the impact on small businesses the proposed Crane and Derrick Negotiated Rulemaking Standard may cause.

I feel that I am in a somewhat unique position to offer various perspectives due to my work history and my current business make-up. I have been in the rigging, crane rental and hoisting business all my life and am a 4<sup>th</sup> generation owner. As George Young Company, our firm owns industrial, boom truck and hydraulic truck cranes which we utilize with our own forces as well as renting to other entities. We also rent operated cranes of all sizes and types from crane vendors. During my tenure, our firm has made thousands of safe crane lifts crane lifts.

I have been a previous President and Chairman of the Board of The Specialized Carriers and Rigging Association whose 1100 members probably own and utilize more cranes than any other segment of the construction industry. It has been my pleasure to have had the opportunity to interact and represent both union and open shop companies, large and small and to understand their problems and their successes.

I was also fortunate to be a committee member on the A10.42 Qualified Rigger Standard Writing Committee and participated with crane manufacturers, safety industry representatives, organized labor groups and representatives of open shop trade associations.

My experience has taught me one simple lesson; cranes are a potentially dangerous tool! The sheer size of this industry can not be over-looked; over 123,000 firms being affected by this standard, over 92,000 cranes, over 107,000 crane operators

and the myriad of industries that utilize cranes make the work of C-DAC a truly challenging task.

As cranes continue to increase in their sophistication, as capacities continue to increase and as possible boom lengths soar to heights never imagined, the need for increased professionalism on the part of crane owners, operators, crane manufacturers' and site managers will be truly needed. Even simple "boom trucks" and "self-unloading devices" have continued to increase in size and therefore complexity. There is nothing to suggest that the need for sophisticated operators will do anything but increase in the coming decades.

Almost a third of our states have already mandated operator certification and most of those have mandated a certification process as good as or equal to CCO. In my experience, this type of training does not produce a "Super-Man" operator but it does produce an operator with a predictable skill level and knowledge base. Not only is this type of certification mandatory in my company for crane operators, but we have expanded this requirement to be needed by all industrial fork-lift truck operators working at construction sites for our firm. I firmly believe our five-year history with this type of certification has been instrumental in being crane accident free. The individual who put together the testing and training and skill requirements are to a great extent crane operating companies themselves. They saw the erosion and low level of operating skills being combined with ever increasing crane sophistication.

Prior to CCO, we were all required to train our operators to protect both themselves and their fellow workers. In-house training programs were at times ineffective. There is an inherent conflict in allowing crane rental companies or firms that use cranes to administer their own training programs. Some firms will take a minimalist approach to training and "wish for the best". The need for third party audited training and certification programs allows employers and co-workers and the public to know that an operator has learned and retained a minimum level of industry identified skills. This just doesn't happen when the fox is minding the hen-house.

Many of my customers demand or require CCO or an equivalent. Many of the states I work in demand or require CCO or an equivalent. Our industry's leading insurance carriers, after years of review of crane and crane related accidents have decided to offer premium discounts to firms that employ this type of training and certification. The members of the leading crane industry trade group, Specialized Carriers and Rigging Association, has seen the need for this type of certification

and have led the charge. OSHA has reviewed the training and found it sufficient to prove proper training in many instances. It is difficult to believe that there is an acceptable alternative to this minimum type of training and skill level assessment.

The cost to certify an operator is quite frankly a very small amount no matter what industry one is in. Most crane operator unions provide certified crane operators at no cost and our firms cost is simply record-keeping. At worst, our cost analysis for training and testing has been \$1,550.00 per operator. Our firms average cost is approximately \$250.00 per operator, including union supplied certified operators and operators we have paid to be certified. Educt the costs of increased productivity, decreased insurance premiums and the costs of accidents and I believe this type of certification actually saves our firm money as opposed to costing us money.

During our panel discussions, I was concerned about the language issue as it related to operator understanding of crane manuals and operating instructions. I had the opportunity to have information from various crane manufacturer's researched as to whether their manuals and instruction were provided in other languages. To a manufacturer, all said crane manuals and operating instructions were provided in English in the United States and they were unaware of these items being translated into any language other than German. The obvious concern is how can we allow crane operators to operate equipment when they can not read or understand the operating instructions? The cost of training one's operator work force in English should not be forced upon an employer but that employer must train his operators to be able to assemble, operate and dis-assemble their equipment based upon the manufacturer's instructions. Cowboy operators and operations that hope for the best when they throw the manuals in the drawer can not serve the best interest of the pubic.

If non-audited company training programs are allowed, how will OSHA compliance officers determine if an operator is properly trained? With the types of training and certification envisioned by C-DAC member, the compliance officer's task will be more do-able. A prescribed set of guide lines is imperative for all crane operators to insure improved worker and public safety.

Perhaps last but not least, many of this standard's detractors have not considered the 4-year implementation period. There are already multiple certification programs operating and there most likely will be additional ones that comply with the proposed standard given the law of supply and demand. Those who desire an in-house training program have four years to effect the training and certification.

Insurance company's records indicate that approximately 80 per cent of crane accidents are operator caused. The current system of training has been shown to be lacking. Given the increasing complexity of cranes, the increasing number of power lines and the current state of training, should America's workers and their families continue to be placed in harms way when a better way exists? I think not.

I have enclosed answers to questions asked on a separate document but wish to thank you for allowing me the opportunity to campaign for increased safety for the over 92,000 cranes that may be working on various sites tomorrow.

Respectfully Submitted,

George S. Young  
President  
George Young Group of Companies

# George YOUNG Company



**RIGGING** • **MILLWRIGHTING** • **HAULING**  
20<sup>th</sup> Street and Oregon Avenue Phila., PA 19145-4296 (215) 467-5315

Kathy Martinez  
SBREFA Coordinator

Dear Ms. Martinez,

Enclosed below are answers to specific questions asked previously, as it related to our small business.

Answers to "Issues the Panel Would Like You to Consider"

A1) No comment.

A2) the Ground Conditions section will be difficult to implement. Often, a crane rental contractor will be working as a second or third tier sub-contractor and the road to the controlling entity will be cumbersome. At the same time, if controlling entities are aware of their responsibilities, greater safety will ensue.

A3) There will be some additional record-keeping requirements and our work (primarily in an old industrial North-East city) around electric lines will change as the area of approach increases. Alternate methods such as utilizing a larger crane with longer boom, placed further away from electric wires will occur but will increase project costs. We will need to perform a minor amount of increased inspections and will need to implement a better fall-protection system when working on top of crane booms.

B1) Both Crane rental companies and general contractors typically bear the burden of matting cranes or improving ground conditions. If soil is soft, then matting is the typical solution. If ground needs to be moved, then the general contractor or controlling entity typically is responsible. When safety is impacted or threatened, controlling entities typically respond.

B2) Assuming a supervisor will go to the hoist site to perform pre-job planning and lay-out, I believe the time estimate is fair. If a special trip needs to be made, then I believe the estimate to be low. We currently spend from 5 minutes to 4-hours assessing a site with an average being an hour.

C1) Crane operators normally supervise the assembly/disassembly process often consulting the operating manual. In difficult situations, project managers from the crane owner are on hand to supervise.

C2) Yes

D1) We work approximately 150 jobs per year within 20 feet of a power line. Duration is 1 day. We work approximately 35 jobs within 10 feet of a power line with a similar duration.

D2) Pre-job planning and equipment selection, identifying power voltage and the correct area of approach, painting lines on the ground, utilizing a cranes swing lock or electronic operator swing aid and/or utilizing a spotter who is in radio contact with the operator. We follow the ANSI standards.

D3) De-energize lines and ground power line and crane. Have pre-lift safety meeting for operators and all craft involved. Assume power line is still energized or back-fed and keep the greatest distance available. Perform work on low humidity days and days with low air moisture content.

D4) Pre-meetings with owners or controlling entity to communicate danger and assess other work that may affect the site. Provide our own lock for "lock-out-tag out" and ground the crane. Employees are also trained in electrical power line contact.

D5) After review, the average times are realistic.

E1) We perform and document shift, project required, annual and after equipment modification or repair. Although we do not perform equipment not in use inspection, the equipment would receive a pre-shift inspection and/or a project site inspection.

E2) We believe we exceed it.

E3) The inspection criteria is similar.

E4) Inspections are performed by operators (shift), operators of independent inspectors (project site, annual and post-modification/repair). The proposed draft would not effect our practices to any significant amount.

E5) Operator aid malfunction language seems tricky but other language is understandable.

E6) Yes. Nothing.

E7) Estimates are reasonable.

F1) We do not have fall protection when walking the cords of a conventional crane and I have yet to see an effective method. Carrier walking surfaces utilize manufacturer rails, hand-rails, hand grabs and steps. Our firm has a 6 foot fall protection standard which we do not meet when we are walking on the cords of a lattice boom crane. If in your responses you read of a company that has determined a method, I would be grateful if you could inform me. When craft has to work on top of a crane cab, we utilize a retractable life-line secure to a 5,000 pound minimum anchorage point.

F2) Cranes are equipped with manufacturer devices primarily and some additional owner installed anti-slip surface coverings.

F3) No.

G1) Verification of CCO certification, verification and investigation of past work history, practical test or certification by an outside third party to CCO or its equivalent.

G2) 35

G3) Union supplied certified operators cost as little as 10 minutes record-keeping at a nominal cost. Costs for certification of operators costs our firm approximately \$1550.00 all-in. I would estimate the over-all average to be currently less than \$200.00 per operator using a blend of union supplied and company paid certification operators.

H1) Utilizing our craftsmen who are trained in A10.42 Qualified Rigger training we have few if any problems. Problems occur in approximately 75% of cases where non-company signalmen are used (typically where we are renting an operated crane to another firm and they provide the signalman).

H2) Yes to the A10.42 Qualified Rigger Standard.

I1) 400 jobs. 2-day average.

I2) 4 cranes. Yes we rent out.

I3) We rent operated cranes from others approximately 250 times a year and CCO or similar certification is required.

I4) We employ approximately 35 different crane operators in a year either directly or through sub-contract.

I5) My review of the times indicated the time spent requesting line voltages are understated. We spend over an hour per request and the proposed standard will require that we perform this many more times per year due to the change from a 10 foot to a 20 foot rule.

My experience indicates that equipment grounding takes less than 10 minutes.

Regarding qualification/certification please refer to costs listed above.

J2) Small businesses typically have dedicated safety professionals at a lower per-centage than big business. I believe that exempting businesses from these rules will decrease worker safety. Exemptions should not be allowed; proper training and testing will improve operator quality.

K1) We document inspections, signal person training, crane operator certification and operator training. If there was a way to report operator caused accidents to a national data bank that would allow employers to check past work history as it refers to accidents, we would have a powerful tool. The record-keeping instructions are clear and are needed.

**Tony Zelenka**  
**Bertucci Contracting Corp.**



**Bertucci Contracting Corporation**  
**PO BOX 10582**  
**Jefferson LA 70181**  
**504-835-0303**

September 13, 2006

Mr. Robert Burt  
Chairman, Small Business Advocacy Review Panel  
Occupational Safety and Health Administration  
U.S. Department of Labor  
Room - N3641  
200 Constitution Ave, N.W.  
Washington D.C. 20210

Dear Mr. Burt,

I would like to thank you and the Small Business Advocacy Review Panel for appointing as a Small Entity Representative (SER) for the Cranes and Derricks in Construction Small Business Enforcement Fairness Act (SBREFA) Panel. Following are a few of the points that I would like to re-emphasize and attached are the responses to your questions.

Bertucci Contracting Corporation is a small family business located in south Louisiana. We have three draglines that perform bucket dredging and material unloading building structures for the U.S. Army Corps of Engineers. Most of our work is in very remote locations and we rarely, if ever, encounter power lines or do any lift work.

One of our main concerns is that the level of crane and operator certification is far greater than the risks inherent in our operations. We have been operating draglines since the late 1940's and have never had an injury or death do to boom failure or electrocution. I have been working in our industry for over twenty years and can not recall any instances associated with our type of work. I would like to see some effort made to match the level of certification with the level of risk in the type of work being performed.

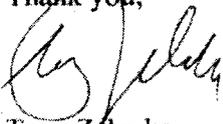
Another concern that we have is that we are the only small business operating in our market. Any additional costs incurred with compliance will only add to our competitive economic disadvantage. Our work is low bid firm fixed price and we have very little ability to pass on any increase to the owner.

I also think that your cost calculations need to be adjusted to include the job demurrage as we shut down the equipment and operators to get them certified. Our draglines are performing the central operation critical to completing our jobs. If I have to shut one down to get the machine or operator certified, I shut down my entire job. The result of this is the idling of tug boats and material barges as well as the crane barge causing us to incur some very substantial costs.

The last point I would like to make is on section 1437 (n). This requires us to have the manufacturer or a qualified person make an adjustment to the load charts to compensate for barge mounted cranes. Most of the work in our industry is performed by cranes that were manufactured to perform duty cycle work as there primary function (draglines). These are not machines that were built for lift work that have a third drum added to them. There are very few dragline manufacturers still in business and I know of nobody that would be qualified to make these calculations. We would not be able to comply with this requirement.

Once again, I appreciate this opportunity to work with you to examine the cost associated with this draft proposed standards and its affects on small business owners. I have addressed many of the questions on the following page that the panel had discussed on the SBREFA conference calls.

Thank you,



Tony Zelenka  
Bertucci Contracting Corporation

## **A. General**

1. *Could changes be made to make the draft proposed standard easier to understand? Are there any specific types of information that OSHA could provide to help employers in this regard?*

I believe that the draft proposed standard is not too difficult to understand. However, it is too voluminous for a typical small business firm to examine. The standard will create added cost to a small business in the form of additional staff or a consultant to oversee the new compliance mandates.

2. *Does the proposed standard include provisions for which compliance may be difficult which would be improved while maintaining employee protection?*

Yes, it could attempt to match the level of risk inherent with the type and usage of the crane with the level of inspection and certification of the crane and operator. There is a huge difference in the potential risk in working a dragline excavating a dirt pit or remote waterway as opposed to working a 200 ton crane hanging steel on a building construction site in the middle of a large city. There should be different levels of certification for equipment and operators.

3. *Would any of the proposed requirements cause you to significantly change the way you or others in your industry do things, and what effect would such changes have in terms of time, money, and safety? Please explain and support your conclusions with specific information or examples, if possible.*

## **B. Ground Conditions**

1. *Who typically takes care of correcting insufficient ground conditions? When ground conditions are unsuitable for setting up a crane, do you have problems getting them corrected?*

This does not apply to us as our machines are mounted on barges.

2. *OSHA estimates that the new regulation would add 30 minutes of a supervisor's time to assure adequate site assessment. How much time do you spend on site assessment now and who is responsible for it?*

## **C. Assembly/Disassembly**

1. *Who normally supervises the assembly/disassembly process?*

This does not apply to us.

2. *Do you always follow the manufacturer's instructions for assembly/disassembly?*

#### **D. Power Line Safety**

1. *In how many jobs does your company work closer than 20 feet to power lines? How many days of the job typically involve working closer than 20 feet to power lines? How many jobs does your company do that require working within 10 feet of a power line? How many days of the job typically require working within 10 feet of a power line?*

We rarely work near power lines.

2. *What precautions does your company take to ensure that the minimum allowable clearance from a power line is maintained? Does your company follow the power line safety requirements set forth in the current ANSI standard (B30.5)?*
3. *If your company works closer than 10 feet to power lines, what precautions does your company take to ensure employee safety?*
4. *OSHA's estimate of the costs of various power line safety measures are given on pages 25 to 28 of PIRFA. Can you improve on these estimates?*

#### **E. Inspections**

1. *The draft proposed standard would require inspections at specific intervals (shift, monthly and annual), and follow certain activities (equipment modification, repair/adjustment, severe service, equipment not in regular use). To what extent is your company already performing similar inspections? What inspections do you currently perform?*

Our operators inspect their machines daily. We have our cranes inspected and certified once a year by an outside company. We have our booms recertified after major repairs.

2. *Do you follow the current ANSI standard for inspection frequency?*
3. *The proposed standard lists items that must be included in each type of inspection. To what extent is your company already inspecting these items?*

We are conducting the appropriate inspections; however we may not be documenting them to the extent required.

4. *Who currently conducts your inspections and how, if at all, would the draft proposed standard affect your current practices?*

See answer to number 1.

5. *Are the corrective action provisions in the draft proposed standard clear enough to be understood and implemented?*

Yes.

6. *Does your company keep records of inspections? What would you need to do differently to achieve compliance with the requirements in the draft proposed standard?*

Yes, however, we would have to increase the amount of recordkeeping we already perform.

7. *OSHA assumed that daily visual inspections of the crane were standard practice, and took no costs for this inspection requirement. For monthly and annual inspections, and inspections following repairs, OSHA estimated that an additional 15 minutes would be required to meet the new requirements for each of these types of inspections. Could these estimates be improved?*

OSHA's estimates do not take into account the additional documentation and record keeping involved with the new requirement.

#### F. Fall Protection

1. *What fall protection measure does your company currently use to ensure employee safety when on the walking/working surfaces of a crane? Does your company require the use of fall protection equipment? If so, when?*

Our machines are equipped with handholds, grab rails, railings and slip resistant surfaces.

2. *The draft proposed standard contains requirements relative to steps, handholds, grab rails, railings, and slip-resistant surfaces. To what extent is your crane already equipped with any of these fall protection devices/aids?*  
a. *Are these devices/aids manufacturer installed?*  
b. *Where are these aids located on the crane? (e.g. cab access/egress)*

Some of the equipment is manufacturer installed and some have been added by us. The grab rails and nonskid surfaces at cab access and egress, walkways and railing around the entire cab.

3. *Do you have cranes equipped with a boom walkway? If so:*  
a. *Which types of crane have them, and*  
b. *Approximately when were they manufactured?*

#### G. Operator Certification/Qualification

1. *How does your company assess whether an operator is competent to operate a particular crane/derrick? Do you have your own assessment procedure, or do you have the operators certified by a testing organization?*

Our crane operators are trained by company employed competent individuals and then are later trained and certified by outside qualified professionals.

2. *How many crane/derrick operators do you employ each year?*

We have four to five operators.

3. *In its preliminary cost estimates, OSHA estimated that certifying a crane operator would require 2 days of a crane operator's time, plus \$500 per operator for training costs, and \$250 for the test itself. This estimate includes time for review and test preparation, as well as the time required to take the test. Could this estimate be improved?*

OSHA's estimates do not take into account lost production costs in idling equipment and personnel. Bertucci currently complies with the Army Corps' requirements, which are non-transferable to other work outside of the Army Corp, and the cost associated with being compliant with the Army Corps' cost and also being compliant with OSHA's regulations would be over-burdensome on a small business.

I recognize that OSHA has provided estimates for what they consider as the most conservative option (Section 1427(a)), however, there are three additional options available and data should be provided to determine what it is the most conservative option. A proper determination cannot be made without reviewing all of the information available. According to research that has been done by the AGC of Texas, estimates have been provided which approximates that a program to be accredited by a nationally recognized accrediting agency would cost an organization approximately \$250,000-\$500,000, plus annual maintenance. Additionally, CCO stated that it took more than four years and over \$500,000 to create their program. Though an option, it would not be cost effective for a small business owner to hold an accredited training and exam onsite due to having a limited number of crane operators.

The cost estimates for certification and qualifications provided by OSHA appear to only include the costs for the external test preparation course. However, it does not address the internal cost to the employer such as replacement workers or production down time to the employer. There is also no suggestion that such costs are addressed in the longer list of options for certification and qualifications in the draft standard.

According to the PIRFA, OSHA estimates the cost for operator training for certification/qualifications to be a total of approximately \$1,251 per person with 2

days of a crane operator's time. However according to my research done over the internet and with the training resources provided by the NCCCO website, 18 providers were contacted and the average time for a crane operator would be 5 days for training and exams. The average cost for a crane operator would be approximately \$2,900 per person for training, exam and wages. The average cost for the exams are \$382, with training or prep costs averaging at \$1,260 and wages for the operator of \$1,255. Additional costs for math and reading classes, if needed, would be averaged at \$750, which was not been factored into the total cost of \$2,900.

## **II. Signal Person Qualification**

1. *Do you have problems with signal persons not knowing how to give or understand signals, or not sufficiently knowing about crane operations? Do most signal person have a basic understanding of crane operation, including the dynamics involved in swinging and stopping loads?*

We have not had problems with signal persons. Signal persons on our jobs have sufficient knowledge.

2. *Do you currently train and test signal persons?*

Yes, we provide on the job training. I believe that this is critical to incorporate for the safety of the operations.

## **I. Costs and Economics**

1. *How many jobs do you do in the typical year that require cranes or derricks? On average, how long is the crane or derrick on site?*

We have approximately 20 jobs per year. Our machines are on site for the full duration of the job.

2. *How many crane/derricks do you own? Do you rent out these cranes or derricks?*

We have three draglines and do not rent them.

3. *Do you rent cranes or derricks from others? Do you provide your own operators or rent the crane with an operator? How many time a year do you rent a crane or derrick from others?*

Occasionally, we rent; however, we have our own crane operators.

4. *How many crane operators do you employ? What is the annual turnover in crane operators?*

We have four crane operators and no turnover.

5. *Please review and provide comments on the specific unit estimates used by OSHA to determine costs and impact associated with the draft proposed standard, as summarized in Table 7. Note that costs are calculated only for the proposed requirements not already required by the existing standard.*

There is no allowance for unforeseen delays and costs in the report. Our work is done from floating plants in remote waterways. There are always delays in trying to get people to our equipment or our equipment to the dock. It also does not take into account the cost of delays to our jobs as we shut down the main component of our production.

The PRIFA is meant to be a review and analyze the cost and economic impact to small entities/businesses that the draft proposed standard will have. Unfortunately, the document is has not been helpful because the underlying data is not sourced in many of the areas and citing the "Office of Regulatory Analysis" is not a sufficient source for me to understand or evaluate the nature or consistency of the data nor does the report truly take into account all of the varying cost associated with complying with the proposed standard. The overall cost analysis of the PIRFA is incomplete; the tables do not represent a true cost to an employer. Many of the calculations do not factor the full wage and compensation or loss of production for complying with the proposed standard.

Overall, the PIRFA would greatly benefit from more informative sourcing. Much of the data cited wasn't obtainable for verification. Calculations of the data and averages didn't always make sense and footnotes or notations would have been helpful.

#### J. Alternatives

1. *Pages 32 to 35 of the Preliminary Initial Regulatory Flexibility Analysis (PIRFA) describes several alternative to the draft proposed standard that were considered by OSHA and the Cranes and Derricks Negotiated Rulemaking Advisory Committee (C-DAC). These pages also contain C-DAC's and OSHA's rationale for not adopting the alternatives. We would appreciate your ideas on these and any other alternative you believe OSHA should consider. While the Panel actively encourages you to think about a full range of alternatives to the draft proposal, please bear in mind that any alternative selected must fully protect employee safety.*

This level of inspection and certification is excessive for many applications; for example, bucket dredging. Some attempt should be made to have two or three classifications or tiers for cranes and their usages that are based upon potential for accidents or type of jobs. OSHA should investigate reasonable alternatives

available for certification and qualification of crane operators while keeping employees safe and protected on the job. Information on where these incidences are happening and specific areas on work or types of cranes that are being used during the accidents and fatalities would assist in the better understanding of the reasons for the accidents. There are a few training programs that could easily be adapted and utilized without the incorporation of the required accrediting by a nationally recognized accrediting agency.

Crane operator certification programs should meet some "performance standard" within the OSHA standard that defines minimum criteria and knowledge needed, which OSHA has defined the minimum knowledge and skills needed in Section 1427 "Operator qualification and certification," paragraph J "Certification Criteria." OSHA needs to delete Section 1427a-e, which would allow for the flexibility that a small business would need to comply with the standard, while keeping safety a priority on the site.

Many general contractors have excellent crane training and qualification programs that are specific for their company and jobsites. A "one size fits all" national certification program that distinguishes between lattice boom and hydraulic, crawler and rubber tired, and above and below 17.5 tons is not adequate in determining the competencies of operators when operating a specific crane for a specific job. Additional training and qualification will have to be completed even if an operator already obtained NCCCO certification. Using an existing third party institution of higher learning such as the USDA Cooperative Extension Service, U.S. Army Corps of Engineers (USACE), TEEK or city, county or state certification programs could prove to be an adequate option.

NCCCO will make accommodations for English speaking person who cannot read by providing them with a "reader" who will verbally read each question and answer. Yet, they will not provide a written test to persons for whom English is not their native language nor provide a translator. If safety is the goal, then why will they provide a "reader" to persons who cannot read yet will not provide materials in various languages or translators? Many contractors provide crane operator manuals and load charts in the native language of their operators. Individuals who are non-English speaking should also have the right to reasonable accommodations.

Currently under the draft proposed standard, a small crane operator is required to meet the same certification requirements as an operator of a several hundred ton crane. Certification requirements should be graduated based on load capacity. Although drug testing was ignored, my experience with drug abuse in construction is showing an increase. This increase has amplified the importance of enforcement for a drug testing requirement for certified operators. To eliminate this aspect of the certification process is to negate the balance for any reason to even modify the existing crane standards. I deeply believe in these

particular issues and seriously question any attempt to leave out a drug testing requirement.

OSHA has also left out requirements to meet minimum physical requirements. Physical exams are a necessity in this particular field. Determination of vision, hearing, and potential for seizures, epilepsy, emotional instability, high blood pressure and other physical impairments should be a part of the requirements for safe crane operations.

Another alternative is that OSHA requires the construction industry employers to follow physical examination and controlled substance and alcohol testing guidelines similar to the guidelines that the U.S. Department of Transportation (DOT) already requires for the transportation industry.

OSHA could also "grandfather" certain portions of the standard. In reference to crane operator certification and qualification, operators who have a certain number of years of experience and a certain amount of training could be "grandfathered" in the draft proposed standard.

2. *Are there difference in small business practice such that small businesses could be exempted from any portion of the draft proposed standard without the loss of worker protection (please explain your answer)?*

Perhaps in reference to the accrediting process, small business entities could prove that their safety and training requirements for crane operators are ample for the job site and work that they perform and could be exempt from requiring their crane operators be certified by an accrediting organization.

#### **K. Documentation**

1. *The OSHA draft proposed standard contains recordkeeping requirements including documenting certain inspections, deficiencies in audited employer qualification programs (1427), signal person qualifications (1428), post-assembly testing of new or reinstalled derricks (1436), and part replacement orders relative to operational aids (1416).*
  - a. *What kinds of recordkeeping does your company already perform? For example, does your company keep records of inspections?*
  - b. *Do you feel that documentation should be required for some additional requirements in the draft proposed standard?*
  - c. *Are the recordkeeping requirements in the draft proposed standard clear?*
  - d. *Do you feel that any of these documentation requirements are unnecessary (please explain your answer)?*

Section 1437 (n) Land cranes/derricks (1) and (2), the manufacturer of our draglines is no longer in business and we know of no qualified person in the area who has the expertise to make these calculations.

**Bernard Weir**  
**Norris Brothers, Co., Inc.**

# **norris brothers co., inc.**

(Via e-mail: [Bruce.Lundegren@sba.gov](mailto:Bruce.Lundegren@sba.gov))

September 8, 2006

Mr. Bruce E. Lundegren  
Assistant Chief Counsel, Office of Advocacy  
U.S. Small Business Administration  
409 Third Street, S.W.  
Washington, DC 20416

Dear Bruce:

Enclosed please find our comments:

### Training and Certification

Norris Brothers is behind training - 100%, and third party accreditation and testing are needed. The need for training for the Operator Engineers has significantly cut the cost for contractors getting certification. The big difference is: "Certified Operators not Stick Pullers".

### Operator Manuals

Grove Crane does furnish some training and material in Spanish for a number of popular machines.

Tadano Crane -- All of their popular machines have Spanish manuals, both for Spanish and Portugal and also for Mexico. Tadano also has manuals for most other languages around the world where they sell their equipment.

### Crane Inspections and Repairs

Most of the newer equipment, in many cases, small companies whose work is being done by a crane dealer in their area. This leaves another hole in the system, because when contractors send their cranes for repairs, do they have to verify their welder is certified?

### Ground Conditions

One of the major problems we are having in the industry is having general contractors and project managers who have no conception of what is required to get a crane onto the job site and set up with proper clearance.

### Operating Engineers in Cleveland

The State of Ohio Operating Engineers Apprentices Program -- During the last 4-5 year has been doing the crane and other training to the tune -- total hours each year 120,000 - 130,000 hours. Training is a major problem in this industry.

### Record Keeping

I see that record keeping will be a major problem for the small contractor.

Thank you for the opportunity to participate.

Very truly yours,

**NORRIS BROTHERS CO., INC.**

Bernard E. Weir, Jr.  
Chairman, C.E.O.

BEW:sd

**Steve Halvorsen**  
**Henry Carlson Company**

Comments and response to new crane standards:

August 14, 2006

1. Panel issues:

- General item #2: (see specific items listed below)

2. Ground Conditions:

- The ground condition issue is not one simply resolved by making the controlling contractor responsible. The conditions may vary due to the following conditions: crane supplier & operator, owner/engineer supplied existing condition information, other structural aspects near the site, occupied space near crane set-up area, underground utilities, crane size, load size (physical and weight), and load setting distance. The controlling contractor may not be able to control all these scenario's. All parties involved in the crane operations need to be involved in the process.
- Regarding adequate site assessment: it is not only whether or not the supervisor's time can be limited to just 30 minutes, but the whole team has to be assessed in the operations and this could include the Superintendent, Project Manager, Director of Safety, Owner, Architect, Engineers, Crane /operator (irregardless of who supplies him), utility companies, etc. This isn't a simple cost even on smaller projects. It may involve multiple cranes due to restraints or load restraints.

3. Power Line Safety:

- No issues with this item.

4. Power Line Safety:

- Approximately 5% of our projects can involve working within 10' of power lines or closer. These involve approximately 5-10 days working in this condition (although lines have been sheathed by power company in the instances or in other condition, we refuse to make the lifts. (half the time).
- Regarding estimates costs of various power line safety measures appear to include only actual on-site time for the issues but do not include the other aspects of travel (to and from) for various entities involved (i.e. Engineer, and the mobilization of the various barricades, lines, etc. To be used.

5. Inspections:

- I believe the required inspections would make our operations more safe and have difficulty not accepting them. I am curious why the monthly inspections would be only required to be maintained for three months. How long are the daily's required to be kept (three days?)? The yearly for 3 years?
- I don't believe that the monthly inspections and the annuals would add only an additional 15 minutes.

6. Fall Protection:

- I am concerned with the degree that OSHA would use this requirement and it would be misused in inspections.

7. Operator Certification/Qualifications:

- We include a third party certification firm for all of our certified operators. The costs for a two day certifications is approximately \$850.00 per operator. (slightly higher than OSHA's estimate.
- Although certified, we still monitor the on the job training, experience, and overall crane operations to insure that certified operators are also qualified and authorized by our company. All three aspects are critical.

8. Signal Person Qualifications:

- I believe that this is critical to incorporate for the safety of the operations.

9. Drug Testing: Although Drug testing was ignored, according to Mr. Burd's cover letter to our packet, "protecting the safety and health of employees" rings in my ears. My experience with drug abuse in construction is showing an increase. This increase, is all the more important to enforce the drug testing requirement for certified operators. To eliminate this aspect of the certification process is to negate the

balance of any reason to even modify the existing crane standards. I deeply believe in this particular issues and seriously question any attempt to leave it out (irregardless of the reason).

**Walt Lewicki**  
**American Crane and Rigging**

**BEAUMONT DIVISION**  
7315 FANNETT RD  
BEAUMONT, TX. 77705  
(409) 842-8100  
FAX: (409) 842-8102

# AMERICAN CRANE & RIGGING

**CORPORATE MAILING**  
PO BOX 22641  
BEAUMONT, TX. 77720  
1-877-842-8100

**HOUSTON DIVISION**  
2220 CATALINA DR  
PASADENA, TX. 77503  
(281) 479-5900  
FAX: (281) 479-5922

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5 September 2006

US Small Business Administration  
Office of Advocacy  
409 Third Street, S.W.  
Washington, DC 20416  
ATTN: Mr. Bob Burt and Mr. Bruce Lundegren

Mr. Burt,

Small Business Regulatory Enforcement Fairness Act, (SBREFA) on  
Cranes and Derricks Negotiated Rulemaking Advisory Committee, (C-DAC) and  
Preliminary Initial Regulatory Analysis, (PIFRA) for  
Occupational Safety and Health Administration, (OSHA).

Thank you for selecting us for the SBREFA panel to present our views and recommendations on the Draft Standard produced by C-DAC.

We write to confirm our views and recommendations and ask the panel to give them a positive response in the report to be submitted to Ed J. Foulke, Jr., Assistant Secretary of Labor for OSHA.

There was a wide ranging discussion about the economic impact of the Draft Proposed Standard and PIFRA. We would like to make the following observations and recommendations by dividing into four sections:

1. Answer to a question asked during phone conference
2. Operator Certification
3. Inspections
4. Crane Power Line Contact, (CPLC)

We have included our company's log book for "inspection prior to use". As I mentioned on SBREFA panel we seek the implementation of insulating links from a safety and liability standpoint.

If you have any questions or concerns in regards to this document please do not hesitate to contact me. This letter is sent by email and courier - please confirm receipt. Once again, thank you for the opportunity.

Sincerely,

Walt Lewicki

## **Section One - Answer to question asked during phone conference**

Question # 1-- How Many Jobs per Year does our company perform?

Answer: In year 2005 our company performed 2,531 jobs.

## **Section Two - Operator Certification**

### **Observations:**

1. Over 50% of SBREFA's panel are listed as members of Associated General Contractors, (AGC). AGC appears to be opposed to Section 1427 "Operator Qualifications."
2. PIRFA p30 suggests two days of training to certify an operator. This is not feasible when covering all topics laid out in appendix Q. It would take at least three days of classroom and one day of testing.
3. There is no provision for retraining / retesting after incident or near miss.

### **Recommendations:**

4. Section 1427 B (1) (i) The governing bodies that issues the accreditation for training facilities must be a **government entity or at least a non biased** third party. *Reason:*
  - a. Undue influence from an economic interest in accrediting its supporters or shareholders.
5. Section 1427 B (1) (ii) B The different levels of certification must be based on the equipment capacity and type and also **be model specific**. *Reason:*
  - a. Each manufacture has their own format for load charts. If an operator can read and comprehend a Grove load chart it does not mean that they can read or comprehend a Liebherr chart.
6. Section 1427 B (2) – A certification under this option is portable but **need to define ownership**. *Reason:*
  - a. The ownership of certification should, by default, rest with the purchaser.
7. Section 1427 B (3) – Certification is valid **for 3 years with subsequent 3 year** evaluations. *Reason:*
  - a. Too much can happen to that operator over a five year period ie. strokes, loss of limbs, worsening vision and other situations which could affect the operator's ability to safely operate the machine.
  - b. After an initial certification an operator should be evaluated not necessarily certified. This would narrow the window of liability for both the employer and certifying company. The cost to evaluate the operator them would be less than certifying.
8. Section 1427 f (2) (iii) The "operator's supervisor" **must be trained to oversee/train**. *Reason:*
  - a. Appendix Q does not develop skills to train. Often skilled people cannot explain nor show to others what they can do or know.

### Section Three - Inspections

#### Observations

9. Section 1412 f (xi) and (xv) Checking pressures and relief valves onsite is a difficult thing to do. This will cause the cost of inspections to increase substantially as it will require the inspection company to do significant research on each machine along with performing mechanical services to that piece of equipment. Historically, inspectors do not perform mechanical services to the machines instead they perform the inspection and report deficiencies to the supervisor who then dispatches a mechanic to repair the unit.

#### Recommendations

10. Section 1412 (a) (ii) – Modified equipment **must be load tested**. Reason:
  - a. How do you know the repair or modification has not changed its lifting properties? A "functional" test could be confused to a functionality test of the modification, i.e. can the grab open far enough.

### Section Four - Crane Power Line Contact, (CPLC)

#### Observations

11. PIRFA P3, quotes 37 to 48 total fatalities, however well supported evidence on Federal Register, (S030 47, 47-1), **estimates 58 CPLC fatalities** alone.
12. PIRFA p8 reports incorrectly that "struck by" as #1 killer. This is confusing as "struck by" includes several sub classes which distort its priority:
  - a. falling objects
  - b. flying objects
  - c. crushed/compressed
  - d. rolling objects
  - e. **CPLC is #1 killer**
13. PIRFA p10 miss useful evidence on Federal Register, including (S030 42-15) ,from showing fatalities by CPLC:
  - a. 1969 to 1978 39%
  - b. 1979 to 1985 48%
  - c. 1986 to 2001 20% this figure was missing in PIRFA and confirms the **analysis that training reduces but cannot eliminate CPLC by itself.**
14. An analysis of all 1238 crane accidents on Dept. of Labor Files from 1990 show that **70% of CPLC electrocutions, or 12% of all crane fatalities,** would have been prevented by insulating links.
15. PIRFA p 23 over estimates **13800 cranes working within table A,** (equal to PIRFA value of 3.75% of 368,000 crane jobs, (calculated by 5% of the 75%). Only a small number of lifts are less than 20ft as confirmed by SBREFA panel's comments to direct question D1 in SBREFA "Issues".

16. PIRFA p 23 estimates a \$427 annualized cost of an insulated link.
  - a. We estimate costs will reduce.
  - b. Cost analysis assumes insulating link only used once per year.
17. PIRFA p25 estimates 91,997 cranes. "Off Highway Research" and "Yengst" **estimated 27500 hydraulic cranes and 6000 lattice booms cranes** increasing by 2000 per year.

**Recommendations:**

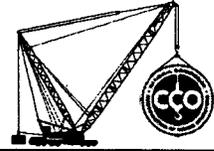
18. **Table A distance is increased to 20ft .** *Reasons:*
  - a. Power lines can sag in the heat of the day after distances have been taken in the morning.
  - b. Power lines can sway due to wind action.
  - c. Only a small number of lifts are less than 20ft as confirmed by SBREFA panel's comments to direct question D1 in SBREFA "Issues".
19. **Tag Line Insulators are included in definitions and sections 1407 (b)(2) , 1408 (b)(2), 1410 (d) (7) etc**  
*Reasons:*
  - a. Tag line insulators have only been introduced to the market since C-DAC finished.
  - b. An inexpensive, \$50, Personnel Protective Equipment, (PPE), can be purchased by the rigger thus empowering the worker. The workers are no longer dependent on their reluctant employers to determine work place levels of safety.
  - c. Tag line insulators are based on existing proven technology.
  - d. Tag line insulators are a potent visual reminder of the threat of crane power line contact.
20. **Work carried out for 1926 Subpart V (Power Transmission and Distribution).have no exceptions in sections 1407-1411** *Reasons:*
  - a. This creates a ridiculous and confusing situation for operators and riggers with the same crane. A contractor installing a power pole by crane follows Subpart N. A Utility installing a power pole by crane follows Subpart V.
  - b. Subpart V workers should not be denied the same minimum inexpensive PPE.
  - c. An example Memphis Gas and Light, who are very safety conscious and work under subpart V, had a CPLC fatality despite all their layers of protection. Now every one of their cranes is fitted with insulating links as another "fool proof" layer of protection.
  - d. **An engineering solution to a human frailty.**

**Thom Sicklesteel  
Sicklesteel Cranes, Inc.**

# SICKLESTEEL CRANES, INC.

**Quality Service Since 1937**

Phone: 360-428-3811 / Toll Free: 800-726-3811 / Facsimile: 360-428-3018



September 2<sup>nd</sup>, 2006

US Department of Labor  
Occupational Safety and Health Administration  
Washington, DC 20210

**Attn: Mr. Robert Burt, Chair – Small Business Advocacy Review Panel**  
**RE: Comments on the draft proposed Cranes and Derricks Standard.**

Dear Mr. Burt;

It was a pleasure and an honor to provide comments regarding the aforementioned rule's potential impacts on small businesses. Thank you for the opportunity to do so. As discussed, please find my written comments below.

## Background

Sicklesteel Cranes, Inc. is a crane rental company based in the Pacific Northwest. We have 29 mobile cranes and perform rentals with operators in the construction and petrochemical industries. Each of our cranes average 77.2 jobs per year with an average job length of 2 days. We have a number of jobs that are just 1 lift lasting less than 1 hour. While our construction work brings steady employment to 45 operators, we "ramp up" for crane services during petrochemical turnarounds to 65 – 70 operators. Those additional 20-25 operators are typically only hired for 30 days twice per year. During the petrochemical turnarounds, we also rent cranes from manufacturer distributors and provide our expanded work force to operate them. We are a unionized company and I am a member of the Training Trust as well as the management co-chair for the Washington State Crane Safety Association.

## Estimates – General

- Jobs per year – We average 77.2 – we would estimate 2,500,000 for the industry (27.17/crane). Smaller crane companies have smaller cranes that typically work shorter term jobs. For example, we have 3 cranes that average 4 jobs per work day.
- Average job length – 2 days

## 1401 – Definitions

- "Days" needs to be defined as calendar or business in reference to section 1416(d) and 1416(e)
- "Equipment Capacity and Type" is unclear in section 1427. ANSI B30.5-3.1.2 states "Operators shall be required to successfully meet the qualification for the specific type of crane (see Figs 1 through 10) that they are operating." In the event the draft proposal is attempting to be similar to ANSI, Figures would need to be attached and references to those figures would need to be included in any language where "Equipment Type" is referenced. In the event the draft proposal is attempting to require operator qualification and certification per equipment model, there would be significant economic impact above the ANSI standard as operators would be required to certify for every make and model of crane rather than crane type. For our company, instead of requiring 3 levels of certification, we would need to have 23. Further, we are unaware of any accredited agency that offers certification per model of crane.

## 1402 – Ground Conditions

- Generally, the crane company is responsible for outlining the space requirements and the controlling entity is responsible for providing the adequate room and sufficient ground. Site work is generally expensive and controlling entities try to avoid incurring additional costs.

### Field Locations

WASHINGTON – Bellingham, Kent, Spokane  
OREGON – Portland

### Corporate Headquarters

1021 Sicklesteel Lane  
Mount Vernon, WA 98274

### Tacoma Branch

Phone: 253-396-1600 / 800-726-3811  
Facsimile: 253-396-1602

## SICKLESTEEL CRANES, INC.

- We believe paragraph (e) should be stricken. Not only does it confuse an otherwise clear standard by indicating only one of many possible solution paths to poor ground conditions, it also creates ambiguity as to who is ultimately responsible for the ground. Example: In the event the equipment is assembled, or if the individual supervising the equipment doesn't raise an issue with regard to the ground conditions, is the individual supervising the equipment assembly or the operator deemed to approve the ground conditions? We believe that if anyone determines that the ground conditions are questionable, the job should be stopped and the situation rectified before any further exposures are created. This is especially true when only one operator is on the job site from the crane company and is unable to see the grounds reaction while operating.
- To obtain adequate site assessment, ground bearing capacity would have to be defined and compared to the loading of the machine. Soil testing and proper analysis for ground conditions would take an additional minimum of 4 hours per crane job to ascertain appropriately and should be performed by the controlling entity. Therefore, there is no additional time to implement the standard. However, if paragraph (e) remains in the standard, there would be an additional 2 hours per job for review of site conditions by the crane company.

### 1407 - 1411 – Power line safety (up to 350 kV)

- 7.3% of our jobs per year are within 20' of power lines. .04% of our jobs per year are within 10' of power lines.
- We are unaware of any cranes that are equipped with proximity alarms and therefore believe that spotters would be used 100% of the time.
- The reference to "employer" needs to be removed from the section. ANSI B30.5-3.4.5 describes the steps to follow in the event of working near power lines. By putting the word "employer" into the proposal, the draft proposal becomes unclear. For example, in a lift where multiple employers are involved, does each and every employer need to provide spotters and safety measures? In most of our crane jobs, the power lines are a site restriction and therefore need to be resolved by the controlling entity. In the event the draft proposal is attempting to require each and every employer to provide spotters and safety measures, we would have an additional impact from over the ANSI standard of a supervisor for 2 hours (to obtain the power line information) and a spotter for the average job length (2 days). Please note that getting the power line information proves to be difficult and can take several weeks.
- We would encourage OSHA to make a requirement that all power lines be marked with the voltage so that anyone working near the power lines could be aware of the extent of the hazard.

### 1412 – Inspections

- Modified Equipment
  - The wording in the proposed draft could be read that any boom dolly, booster, or other transportation system dispersing the weight of the crane for movement on the highways would be required to be approved under section 1434. Transportation systems should be specifically identified as an exception to this section.
- Repaired / Adjusted Equipment
  - The language in this section conflicts with the operator aid section (1416). Which section is the controlling section?
  - OSHA only projected 10% of all cranes being repaired annually. With that may be true for repairs, paragraph (b)(1) defines a repair or adjustment that relates to safe operation. We believe that 100% of all cranes will have an adjustment to a safety device, operator aid, critical part of control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating system each year.
- Shift Inspections
  - We do not believe the proposed standard should dictate that inspections should be performed prior to each shift. Not only do some deficiencies only become apparent after operation, but there is also a lack of time to implement remedies without impacting the work and thereby putting the operator in a difficult situation. ANSI B30.5-2.1.2 states that frequent inspections include "observation during operation for any deficiencies that might appear between regular inspections." We would strongly recommend aligning 1412(d) with ANSI. In the event the draft proposal is attempting to require an additional inspection prior to the shift the additional impact from over the ANSI standard would be an operator and secondary person, if applicable, for ½ hour per shift. In the event the draft proposal would be modified to allow inspections to occur by the end of shift, there would be no impact over the ANSI standard for this element of shift inspections.
  - Section 1412(d)(1)(vii) should be removed in its entirety. The reason wire rope inspection as defined by the draft proposal is not called for in ANSI is that it is unachievable on a consistent basis. In order

to inspect the running and standing wire ropes, the boom must be lowered. Lowering the boom to inspect the ropes can not be achieved at all sites prior to shift work. Further, some cranes would require substantial disassembly in order to move the crane to a position to be able to inspect the wire rope. ANSI B30.5-2.1.2 does not contain language requiring inspection of running or standing wire ropes other than the rope reeving for compliance with crane manufacturer's specifications (2.1.2(f)). In the event the draft proposal is attempting to require a visual inspection of standing and running wire rope the additional impact from over the ANSI standard would be an operator and secondary person, if applicable, for 3 hours per shift (the average time require to move the crane to a "lay-down" area, inspect the wire rope, and return it to the working area). In the event the draft proposal would be modified as recommended, there would be no impact over the ANSI standard for this element of shift inspections.

- Section 1412(d)(1)(x) should be either removed in its entirety or put under section 1402 – Ground Conditions. Ground conditions are the responsibility of the controlling entity. Placing this element under the inspection of the crane seems inappropriate and confusing. ANSI B30.5-2.1.2 does not contain language requiring this element of inspection. In the event the draft proposal is attempting to require an operator inspection of the ground, the additional impact over the ANSI standard would be 15 minutes per shift for an operator and secondary person, if applicable. In the event the draft proposal is modified as recommended, there would be no impact over the ANSI standard for this element of shift inspections.
- Section 1412(d)(1)(xi) should be removed in its entirety. This is an element that is a part of the manufacturer instructions and, to which, the manufacturers have varying requirements as to "level". Further the paragraph is unclear as to its intent. Is it intended to ensure the equipment is in a level position when it's parked? Is it intended to ensure the equipment is in a level position as it is being assembled, even if the assembly process takes multiple days (i.e. 4600 ringer)? Is the equipment level not necessary during movement? What are the tolerances of level? ANSI B30.5-2.1.2 does not contain language requiring this element of inspection.
- **Monthly Inspections**
  - While items under shift inspections are incorporated, paragraph (d)(x) and (d)(xi) make even less sense under the monthly inspection scenario. Recommendations stated above for these paragraphs apply here as well.
  - For clarity purposes, we believe it important to restate (1412)(d)(2) under paragraph (e). It is important to maintain evaluation of any deficiency and the determination as to whether the deficiency constitutes a hazard at each level of inspection. ANSI B30.5-2.1.2 (frequent inspections) and B30.5-2.1.3 (periodic inspections) contain similar language under both subsections.
- **Annual Comprehensive**
  - We believe that section (2)(xiv)(D) should include the word "setting". To measure correct pressure, one would have to take apart each line to check pressures. To achieve a pressure setting, one could rely on the appropriate action of the item at the end of the line. If the draft proposal is attempting to require measurements of pressure levels of each and every line, 2 additional days of inspection time would be required beyond the ANSI standard. In the event the draft proposal inserted the work "setting", we believe that it would be comparable to the ANSI standard and there would be no additional impact.
  - We believe that section (2)(xx) should be removed as paragraph (xxi) seems to address safety concerns. Many times originally equipped steps and ladders are removed for transport purposes (i.e. attaching dollies). Also, the language could be read that the standard is attempting to make each crane contain it's original ladders and steps. Most ladders and steps need repair within 10 years of manufacture date.

#### **1416 – Operational Aids**

Older operational aids prove difficult to even get part numbers for to place orders. For older systems, we average a 74 day wait (with the most being 283 days) to merely get a part number or alternate part number so the order can be placed. Further, manufacturers of operational aids only keep parts on the shelf a maximum of 12 years and do not offer upgrades or replacements. Once an element fails in an operational aid that is no longer supported, crane owners aren't able to order a part and have had great difficulty in getting any assistance from any of the operational aid manufacturers for a replacement.

Example: The earlier version of the PAT DS350(kd) has already been taken out of the manufacturer's inventory with no upgrade or replacement available. The more recent PAT DS350(g) system which multiple manufacturers used on more than 14,000 cranes up through the mid 1990's is scheduled to no longer be supported in 2009. While crane models that hydraulically extend sections equally may have a

replacement system (which would cost more than \$20,000 per crane to install), crane models that have multiple extension sequences for a single boom length do not have any alternatives (projected at 15% of the 14,000 models). In effect, this language would cost the industry \$280,000,000 in the best scenario assuming all systems could be upgraded, and more than likely would render 2,000 cranes out of compliance.

We are very much in favor of a standard that addresses this area but believe it needs to be measured and reflective of our current situation. Manufacturers have an incentive to "outdate" systems and not store parts for the life of their equipment. The sooner the equipment is difficult to buy parts for, the sooner the large companies dispose of them and buy newer cranes. The difficulty is that most of these cranes find their way to the smaller businesses who can't afford the new cranes. Manufacturers should be required to retain inventory on operational aid systems for 25 years – the life expectancy of their crane.

Secondly, the manufacturers should provide an upgrade alternative for each an every system that is on their cranes. What has happened to a large extent is that in the 1980's and 90's manufacturers typically relied on outsourcing the operational aids to companies like PAT. In the 2000's the trend has been for the manufacturers to reclaim this area and design their own systems. This leaves a gigantic disconnect for owners of cranes with PAT systems because the manufacturer no longer supports PAT. In the event manufacturers do not have an upgrade alternative, and exception to the standard should be made.

Lastly, the draft proposal should remove language that dictates timetables that can't be met in all scenarios.

- 1416(d) – shall be repaired no later than 7 days
- 1416(d) – if the employer documents that it has ordered the necessary parts within 7 days
- 1416(e) – shall be repaired no later than 30 days
- 1416(e) – if the employer documents that it has ordered the necessary parts with 7 days.

We believe this language would be appropriate as soon as the issues regarding the manufacturer have been resolved.

#### **1427 – Operator Qualification and Certification**

Sadly, the area of operator qualification and certification is one of the few areas that companies employing crane operators do not typically comply with. As the management co-chair of the Washington Crane Safety Association, we found that 24 of the 27 companies were not complying with ANSI. The importance of this point is that many of the discussions surrounding the costs of Operator Qualification and Certification were bemoaning the elements of the proposal which are directly aligned with ANSI. We believe that arguments for costs of the draft proposal related to written examination covering operational characteristics which demonstrates the ability to read, write, comprehend, and use arithmetic and a load / capacity chart in the language of the crane manufacturer's operation and maintenance instruction manuals to be mute. To be blunt, this is already a requirement under ANSI. The only area where it seems the draft proposal goes beyond ANSI is the requirement of the qualifications of the entity or individuals who confirms the operator meets the requirements. It is our belief that this requirement actually creates a savings for employers who are currently implementing the ANSI standards and a less expensive alternative to employers who aren't.

Under ANSI, crane operators must be qualified by their company through a written exam and practical exam. This means that under the current standard, each and every operator has multiple days of time to qualify for each new employer. Further, individual companies have to develop, implement, update, and maintain their own qualification systems as well as possibly defend the adequacy of them.

Larger company's have safety directors, trainers, HR departments and can more easily absorb the costs of implementing their own qualification program. However, smaller companies usually rely on "canned" products or avoid following the standards altogether.

The cost to properly implement ANSI on an individual basis is equivalent to 2 days of an operator + 1 day for equipment (for the practical exam) + 2 days of supervision per newly employed operator + 2,500/year for updates to the qualification system. With OSHA projected a turnover of 24,610 operators per year, this amounts to \$26,614,238 for the operator and supervisors, \$24,610,000 for the practical exam equipment and with 121,393 firms being required to have a program, costs to update the system will be \$303,482,500 per year for a total of \$354,706,738. Of this amount, more than 86% of the costs are the development, maintenance and updating of the individual companies qualification systems.

**SICKLESTEEL CRANES, INC.**

A nationally recognized certification that comes from an accredited organization provides a less expensive path to compliance with current standards. By making crane operator certification a condition of employment, small companies can reduce the number of days for training in ½ and can focus on machine specific training. Further, there would be no need to spend the money on a qualification program. Therefore, the projected costs would be \$13,307,119 for the operator and supervisors, \$24,610,000 for the equipment and \$0 for the qualification programs. A savings of \$316,789,619 per year from the ANSI standard.

In the event the draft proposal seeks to go beyond ANSI and qualify operators per model of crane (as discussed under definitions), the costs would be substantial. The ANSI level of \$354,706,738 for operator qualification would have to be multiplied by possible crane types. For our company, we would multiply this number by 23. It is our belief the proposal should be clarified as to this point.

With regard to potential increases in the wage rates due to this "special certification", we believe this argument is also unfounded, particularly in the light of it being a national standard. When national standards define qualifications of employment, such as a CDL license, typically wages do not jump up. Rather, when individual employers have varying requirements, such as the case now, employers are more vulnerable to wage pressures.

Lastly, we would recommend that all operators be required to provide evidence of passing a CDL medical examination. Having nothing in the new standard referencing the physical requirements is strange. By adopting the CDL medical examination, operators who hold a CDL license are only required to pass one test and its already widely known within the medical community.

Thank you again for the opportunity to serve in this manner. Should you have any questions, comments, or concerns, please feel free to contact me.

Kind Regards

*TE Sicklesteel*

Thom Sicklesteel  
President  
Sicklesteel Cranes, Inc.

Appendix D—PIRFA w Supplements

**PRELIMINARY INITIAL REGULATORY FLEXIBILITY ANALYSIS  
OF THE PRELIMINARY DRAFT STANDARD FOR  
CRANES AND DERRICKS IN CONSTRUCTION**

Office of Regulatory Analysis  
Directorate of Evaluation and Analysis  
Occupational Safety and Health Administration  
U.S. Department of Labor

June 7, 2006

## **Introduction**

OSHA intends to propose pursuant to the Occupational Safety and Health Act and Negotiated Rulemaking Act the Cranes and Derricks Negotiated Rulemaking Advisory Committee (C-DAC or the Committee) recommendations that address occupational hazards associated with cranes and derricks in the construction industry. In the development of this proposed draft standard, OSHA wishes to ensure that the regulatory requirements will be effective in reducing risks and will not impose any unnecessary burdens on employers. C-DAC itself included members whose interests reflected those of small businesses.

OSHA has a particular interest in identifying and responding to concerns of potentially affected small businesses and other small entities at an early stage in the rulemaking. Thus, as part of this rulemaking, prior to the publication of a proposed standard in the Federal Register, OSHA is convening a Small Business Advocacy Review Panel (SBARP, or the Panel) in accordance with Section 609 of Title 5 of the United States Code.

The SBARP process enables OSHA, with the assistance of the Chief Counsel for Advocacy of the Small Business Administration and the Office of Information and Regulatory Affairs in the Office of Management and Budget, to obtain advice and recommendations from affected small entities about the potential impacts of a standard. The SBARP process engages affected small entities to respond to OSHA's proposed draft standard and concludes with a final report from the Panel. The Agency considers the Panel's report and information gathered from small entities in its decision making process and in the presentation of alternatives.

This Preliminary Initial Regulatory Analysis (PIRFA) has been prepared to aid in the SBARP process. When a proposed standard is published in the Federal Register, formally beginning the notice-and-comment period of the rulemaking process, the Initial Regulatory

Flexibility Analysis (IRFA) accompanying the proposed standard will discuss the Panel's recommendations and OSHA's responses to those recommendations. As described in the Regulatory Flexibility Act (5 USC 602 et seq.) an IRFA must contain the following elements:

- 1) a description of the reasons why action by the Agency is being considered;
- 2) a succinct statement of the objectives of, and legal basis for, the proposed rule;
- 3) a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
- 4) a description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirements and the type of professional skills necessary for preparation of the report or record;
- 5) an identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the proposed rule; and
- 6) a description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and that minimize any significant economic impact of the proposed rule on small entities.

The Agency estimates that the draft proposed standard will cost about \$89 million per year and prevent 37 to 48 fatalities and 186 injuries annually. OSHA estimates that the monetized value of avoiding the fatalities is \$280 to \$362 million per year; and \$9.3 million per year for avoiding the injuries.

## **Summary of the Draft proposed standard**

The existing rule for cranes and derricks in construction, codified in 29 CFR 1926.550 (Subpart N), dates back to 1971 and is based primarily on industry consensus standards published from 1967 through 1969. Since 1971, Subpart N has undergone two additional amendments. In 1988 a new paragraph (g) was added to §1926.550 to clarify when employees on personnel platforms may be lifted by cranes. Also in 1993, provision (a)(19) was added to clarify that employees were to be kept clear of about to be lifted or suspended loads. There have been considerable technological changes since those consensus standards were developed. Industry consensus standards for derricks and for crawler, truck, and locomotive cranes were updated as recently as 2004. A cross-section of industry stakeholders asked the Agency to update Subpart N's requirements, indicating that over the past 30 years there has been considerable change in both work processes and crane technology that have made much of Subpart N obsolete.

In 1998, OSHA's Advisory Committee for Construction Safety and Health (ACCSH) formed a workgroup to review Subpart N. ACCSH charged the workgroup with the task of identifying key issues regarding the operation of cranes and derricks in construction and proposing draft language in anticipation of a future revision of Subpart N. In 1999, ACCSH passed a motion recommending that OSHA consider negotiated rulemaking as the mechanism to revise/update Subpart N. A Federal Register Notice (67 FR 46612) was published on July 16, 2002, requesting nominations for membership on the Committee and comments on the appropriateness of using negotiated rulemaking to develop a crane and derrick proposed rule. On July 3, 2003, OSHA published a Federal Register notice (68 FR 39877) announcing the members of the Committee.

The first C-DAC meeting was held in July of 2003 and over the next 11 months the Committee met ten more times. The meetings were announced in the Federal Register and open to the public. On July 9, 2004, the Committee reached a final consensus on all issues and successfully negotiated a consensus-based document. This document includes sections covering such major issues as scope; inspections; operator certification and qualification; signal person qualifications; power line safety; and assembly and disassembly of equipment. Summaries of the provisions covering major issues are set forth below.

(a) Scope (Section 1926.1400)

Covered under §1926.1400 of the draft proposed standard, this provision establishes a functional definition of "equipment," coupled with a non-exclusive list of covered equipment as well as a list of specific exclusions. This provision differs in format and is broader than current Subpart N. The scope of the current rule is based on equipment-specific provisions and on industry standards incorporated by reference. For example, a luffing tower crane is not covered by the current standard that only lists hammerhead tower cranes, but would be covered by the draft proposed standard because of an expanded list of covered equipment. Similarly, new technology that is not listed and thus not covered by the current standard would be covered if it meets the functional definition of the draft proposed standard and fits within the parameters of the types of equipment intended to be addressed by the draft proposed standard as indicated by its non-exclusive list of covered equipment.

(b) Inspections (Section 1926.1412)

Section 1926.1412 requires inspections at specified intervals (shift, monthly and annually) as well as for equipment that is modified, repaired/adjusted, post-assembly, not in regular use or subject to severe service. These inspections are similar to various industry

standards in terms of inspection “triggers” and items inspected. Unlike the current Subpart N, this section includes more clearly delineated inspection intervals.

(c) **New Operator Certification and Qualification, and Signal Person Qualification (Sections 1926.1427 and 1428)**

After a four-year phase-in period, crane operators would have to be certified or qualified by one of the following: (1) any crane operator testing organization approved by a nationally recognized accrediting agency; (2) the employer’s own qualification program (audited by a testing organization approved auditor); (3) the U.S. Military; or (4) a government entity. In addition, signal persons would have to be qualified by a third party tester or by their employer. The current standard has no operator certification requirements.

(d) **Power Line Safety (Sections 1926.1407-1411)**

Employers will be required to choose from a list of options for ensuring that equipment does not come within a prescribed distance of power lines. When working closer than that distance, a specified list of safety measures must be taken. In comparison to the existing Subpart N requirements for power line safety, these sections add a layer of preventive measures (some of which are selected by the employer from a list of options) to prevent breach of the prescribed distance. In addition, in comparison to the existing Subpart N requirements, the proposed requirements provide greater flexibility to employers by allowing them to work closer than the prescribed distance provided they institute specified safety measures.

(e) **Ground Conditions and Assembly/Disassembly (Sections 1926.1402; 1403-1406)**

The controlling entity would be responsible for ensuring that ground conditions are adequate for crane set-up and use. Under the draft proposed standard, a controlling entity is defined as “a prime contractor, general contractor, construction manager or any other legal entity

which has the overall responsibility for construction of the project, its planning, quality and completion.” In addition, under §§1926.1403-1406, a qualified and competent person must address a list of key hazards associated with equipment assembly and disassembly. With limited exceptions, the current standard does not address either of these issues.

### **Reasons Why Action by the Agency is Being Considered**

Many construction workers are killed or injured working around cranes and derricks every year. The draft proposed standard will substantially reduce fatalities and injuries among construction workers and will eliminate significant financial and emotional burdens suffered by family members and many other people associated with these cases. Preliminary estimates indicate that as a result of this rulemaking, 37 to 48 fatalities and 186 injuries could be avoided annually by full compliance with the draft proposed standard.

### **Fatalities**

Table 1 outlines the Agency’s benefits assessment of the estimated avoidable fatalities attributed to the draft proposed standard.

<b>Table 1</b>		
<b>Cranes and Derricks Benefits Analysis (Fatalities)</b>		
		<b>Yearly Average</b>
1	CFOI Construction Fatalities	1,123
2	Number of Shock Deaths from Overhead Wires involving Cranes (3.2% of #1)	36
3	Number of Struck By Deaths Involving Heavy Equipment (16.5% of #1)	185
4	Number of Struck By Deaths Involving Cranes (15% of #3) - Low End	28
5	Number of Struck By Deaths Involving Cranes (25% of #3) - High End	46
6	Total Crane Related Fatalities (#2 + #4) (Low End)	64
7	Total Crane Related Fatalities (#2 + #5) (High End)	82
8	Total Avoidable Crane Related Fatalities (59% of #6) (Low End)	37
9	Total Avoidable Crane Related Fatalities (59% of #7) (High End)	48
Source: Office of Regulatory Analysis		
Based on the data, OSHA estimates that 37 to 48 fatalities will be avoided due to compliance with the proposed draft standard.		

To estimate the number of fatalities associated with cranes and derricks, the Agency first averaged 10 years of construction fatality data (1994-2003) from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI) database. Based on the BLS CFOI data, on average 1,123 fatalities occurred each year during that time period.

OSHA then examined an analysis it performed in 1990 entitled "*Analysis of Construction Fatalities – The OSHA Data Base 1985 – 1989*", which assessed the causes of all construction fatalities from 1985 to 1989. [This assessment will be referred to in this section as the "*Fatality Report*"] In the *Fatality Report*, OSHA found that about 22 percent of total fatalities pertained to "struck-by" incidents and 17 percent from electric shocks. In looking at the deaths due to shock, the *Fatality Report* estimated that 3.2 percent of those deaths were due to contact with overhead wires involving a crane (or 36 fatalities). For the struck-by incidents, the *Fatality Report* estimated that 16.5 percent of total fatalities involved heavy equipment. Since the *Fatality Report* did not break down further the number of "struck by" deaths, OSHA estimated that about 15 to 25 percent of these (the struck-by fatalities involving heavy equipment) involved a crane

(or 28 to 46 fatalities). When the shock deaths (36) are combined with the struck by deaths (28 to 46 deaths), the total crane related fatalities equals 64 to 82 (annual average).

To determine the avoidable deaths under the draft proposed standard, OSHA reviewed accident abstracts from the Integrated Management Information System Database from 1995 to 2005. These abstracts consisted of 5(a)(1) citations of the OSH Act and existing 29 CFR Part 1926.550 citations involving a crane in the construction industry. In reviewing these data, OSHA determined that 29 fatalities were similar to the types of accidents addressed by the existing or draft proposed standard. Of these 29 fatalities, OSHA determined that 17 (or 59 percent) would have been averted due to compliance with the draft proposed standard. This ratio was applied to the estimated total crane related fatalities (64 to 82) to preliminarily estimate the range of fatality benefits attributed to the draft proposed standard, from 37 to 48 potentially avoided fatalities annually. These are potentially avoided fatalities because the estimate assumes perfect compliance with the draft proposed standard.

In 2003, OSHA completed a separate analysis of construction fatalities involving cranes. Based on this review of fatal cases from 1997 to 1999, OSHA determined that of the 1,196 cases, 91 of them were identified as crane-related or 8 percent. While the Agency did not use this approach in the benefits analysis, this approach would result in a higher estimate of lives saved under the draft proposed standard. Thus, the Agency chose the more conservative approach.

The above estimate of the number of fatalities avoided does not account for fatalities that could have been avoided as a result of complying with the existing standard. The majority of the costs of the draft proposed standard can be attributed to training needed for operator qualification and certification. Such qualification and certification can help to ensure better compliance with safety practices. Based on a study on crane and rigging fatalities in Ontario, significant

reductions in fatalities occurred after training and testing became mandatory (The Crane Report NewsFlash, 1993). Prior to mandating training and testing programs, crane and rigging fatalities accounted for 19.8 percent of all construction fatalities during the period of 1969 to 1978.

During the period of 1979 to 2001, after the testing and training requirements were mandated, only 8 percent of the total construction fatalities were related to cranes and rigging. While the Agency does not use this data in its benefits estimates, this study does provide evidence of the effects and benefits gained by comprehensive training and testing crane programs.

### Injuries

To estimate the avoidable injuries, the Agency averaged the number of injuries from 1995 to 2004 from the Bureau of Labor Statistics' (BLS) Survey of Occupational Injuries and Illnesses. The assessment of avoidable injuries is presented in Table 2. The Agency obtained estimates of the number of cases involving days away from work involving cranes in construction for the 10 years (1995-2004) from BLS via special data runs. This data consists of mostly struck by cases dealing with cranes in construction; electric shock cases are not included in this data set. OSHA also obtained published data from the BLS website on the number of cases caused by contact with electric current. The Agency estimated benefits based on struck-by and contact with electric current cases.

As shown in Table 2, BLS estimated that over 10 years, 263 injuries per year occur involving a crane in construction. (As noted above, these are primarily struck-by cases.) To estimate the number of potentially avoidable struck-by cases, the Agency multiplied its ratio of avoidable cases of 0.59 percent (derived from the fatality data) by the 263 injuries. This totals 155 struck-by cases estimated to be averted by the draft proposed standard. To estimate the

number of avoidable electric shock cases, the Agency multiplied the number of electric contact cases in construction (as reported by BLS) by the percentage of electric shock cases caused by a crane (3.2 percent). This percentage was also taken from the *Fatality Report*. This totals 31 cases estimated to be averted due to compliance with the draft proposed standard. Combining the struck-by and electric shock cases equals 186 injuries avoided annually.

<b>Table 2</b>		
<b>Cranes and Derricks Benefits Analysis (Injuries)</b>		
		<b>Average</b>
1	Number of Cases in Construction Involving Cranes (CIDAFW)	263
2	Number of Cases Caused by Contact with Electric Current	3,582
3	Number of Cases Caused by Contact with Electric Current in Construction	980
4	Avoidable Cases (#1 * 0.59) - Struck By Injuries	155
5	Avoidable Cases (#3 * 0.032) - Electric Shock Cases due to Cranes	31
6	Total Avoidable Cases	186
Source: Office of Regulatory Analysis		

For informational purposes, the Agency monetized both the avoidable fatalities and injuries based on willingness-to-pay values of \$7.5 million per death and \$50,000 per injury. OSHA has followed EPA's approach to monetizing the reduction of risks of premature mortality, as presented in *The Benefits and Costs of the Clean Air Act of 1990 to 2010* (EPA, 1999) and radon in drinking water. EPA's approach is detailed in Chapter 7 of EPA's *Guidelines for Preparing Economic Analyses*, which provides a detailed review of the methods for estimating mortality risk values and summarizes the values obtained in the literature (EPA, 2000). EPA identified 26 studies that it considered relevant. Synthesizing the results of these studies, EPA arrived at a mean value of a statistical life (VSL) of \$4.8 million in 1990 dollars. EPA employs this central estimate, updated for inflation for application in its regulatory analyses. OSHA has

updated EPA's mean VSL in 1990 using the consumer price index and adjusted for income elasticity and applied a value of \$7.5 million to each premature fatality avoided. In applying these values, OSHA estimates that the annual monetized value of the 37 to 48 potentially avoidable fatalities is \$280 to \$362 million. The estimated monetized value of avoiding the 186 injuries is \$9.3 million.

### **Objective of and Legal Basis for the Draft Proposed Standard**

The objective of the draft proposed standard is to reduce the number of fatalities and injuries occurring among employees in the crane and derrick industry. This objective will be achieved by compelling employers to provide employees with the equipment, procedures, training and information necessary to perform their jobs with greater safety and to ensure that safe work practices are followed.

The legal basis for the rule is the responsibility given the Secretary of Labor through the Occupational Safety and Health (OSH) Act of 1970. The OSH Act authorizes and obligates the Secretary of Labor to promulgate mandatory occupational safety and health standards as necessary "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 USC 651(b)]. Section 6(b) of the OSHA Act and the Construction Safety Act gives the Secretary direct authority to issue standards, 29 USC 655(b); 40 USC 333.

## **Description and Estimate of Affected Small Entities and Impacts**

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires OSHA to estimate the number of small businesses and other small entities potentially affected by the draft proposed standard. "Entity" describes a legal business entity or firm; an "establishment" describes a particular site of economic activity. Size standards were collected from the table of Small Business Size Standards matched to the North American Industry Classification System (2002) from U.S. Small Business Administration's (SBA) website. SBA size standards for the affected industries are expressed in terms of annual average revenues (U.S. SBA, 2002). For the NAICS industries affected by the draft proposed standard, there were three different size standards of "small entity" based on annual average revenues: \$6 million, \$12 million, and \$28.5 million. For NAIC 532412 (Construction, Mining, Forestry Machine and Equipment Rental and Leasing) entities are considered small if their annual revenues are less than \$6 million. For NAICS 238990 (All Other Specialty Trade Contractors) entities are considered small if their annual revenues are less than \$12 million. The other 3 categories, namely "Own and Rent", "Own but Do Not Rent", and "Crane Lessees" contain NAIC sectors where small is defined as annual revenues of less than \$12.0 million or \$28.5 million. The Agency relied on the most recent census data for its description of small entities in affected industries.

The draft proposed standard primarily impacts firms performing construction work using cranes and derricks and firms that rent cranes and/or derricks to be used in construction activities.<sup>1</sup> The industry profile is made up of 5 industry sectors: Crane Rental with Operators (NAIC 238990); Crane Rental without Operators (Bare Rentals) (NAIC 532412); Own and Rent

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<sup>1</sup> The term "rent/rental" as used here indicates the process of renting out a piece of equipment. The term "lessee" is used to indicate an employer paying the owner of the equipment to use it.

Cranes (several NAICs); Own but Do Not Rent Cranes to others (several NAICs); and Crane Lessees (several NAICs).

Table 3 provides the industrial profile of the small entities affected by the proposed rule. It shows the total number of small firms in each industry, the number of establishments operated by these firms, the number of employees of these firms, and estimated total revenues of these firms. An estimated 123,621 small firms are potentially affected by the draft proposed standard. These firms operate about 134,455 establishments and employ an estimated 2,369,089 employees.

Revenues for small entities were estimated using several different methods. For the "Crane Rental with Operators" sector, revenue data were provided by the Census Bureau (CB) via special data runs. For the "Crane Rental without Operators (Bare Rentals), revenue and establishment data were taken from Dunn and Bradstreet (D&B) (2002). To match SBA firm data with the D&B for establishments, OSHA used establishment percentages to get firm estimates based on the SBA published totals. The "Own and Rent" and the "Own but Don't Rent" data were provided in special runs from the CB. The "Crane Lessees" data were derived by taking a percentage of the total number of establishments that engage in heavy construction work where cranes are typically used; the data on these entities were also provided by the CB. Before-tax profit rates were collected from the *2002 Source Book Statistics of Income* published by the Internal Revenue Service (IRS). For six-digit NAICS industries for which data are not available in IRS, OSHA estimated the profit rate based on the broader four-digit NAICS industry. Profits per entity were calculated by multiplying revenues per entity with the profit rate.

The annualized compliance costs for the affected small entities are presented in Table 4. The industry sector with the highest annualized compliance costs per establishment is those employers who own and rent cranes with operators. While crane lessees will incur about 48 percent of the total annualized compliance costs, their per establishment compliance costs are estimated to be only \$377. Aggregating all affected firms that do lease cranes from suppliers, on average, each was estimated to lease a crane 4 times annually. The estimated number of times a crane is rented (4) seemed to be a reasonable average across all cranes. Crane rental durations can range from short term (1 day) to extended periods of time (several years).

**Table 3**  
**Characteristics of Entities Covered Under SBREFA**

Category	NAIC	Industry	Employment	Number of	Number of	Number of	Profit	Revenues	Profits
			Size Standard	Firms				Estabs	Rate (%)
			(Less Than)	(Entities)				(\$1,000)	(\$1,000)
<b>Crane Rental with Operators</b>									
	238990	All Other Specialty Trade Cont.	\$12.0 mil.	1,171	1,223	13,473	4.1	\$1,551	\$64
<b>Crane Rental without Operators (Bare Rentals)</b>									
	532412	Const./Min./For. Machine & Equip.	\$6.0 mil	2,228	4,909	25,574	4.0	\$748	\$30
<b>Own and Rent Cranes with Operators</b>									
	236115	New Single-Family Housing Const.	\$28.5 mil	168	168	261	4.1	\$233	\$10
	236118	Residential Remodelers	\$28.5 mil	21	21	45	4.1	\$528	\$22
	238130	Framing Contractors	\$12.0 mil.	20	20	120	3.9	\$200	\$8
	238170	Siding Contractors	\$12.0 mil.	3	3	18	3.9	\$827	\$32
	238320	Painting and Wall Covering Contract.	\$12.0 mil.	20	20	159	3.9	\$962	\$37
	238150	Glass and Glazing Contractors	\$12.0 mil.	41	41	328	3.9	\$631	\$25
	238210	Electrical Contractors	\$12.0 mil.	12	12	176	3.9	\$1,829	\$63
	238910	Site Preparation Contractors	\$12.0 mil.	311	311	4,706	3.9	\$2,146	\$84
	238110	Poured Concrete Foundation and Struct.	\$12.0 mil.	263	263	4,328	3.9	\$2,256	\$88
	237130	Power and Communication Line and Rel.	\$28.5 mil	36	36	666	4.6	\$2,720	\$128
	237110	Water and Sewer Line and Related Struct.	\$28.5 mil	47	62	1,432	4.6	\$4,570	\$212
	238120	Structural Steel and Precast Concrete	\$12.0 mil.	239	319	7,389	3.9	\$2,668	\$112
	236220	Commercial and Institutional Building	\$28.5 mil	21	28	757	4.1	\$4,803	\$190
	238290	Other Building Equipment Contractors	\$12.0 mil.	104	138	4,076	3.9	\$3,801	\$148
	237990	Other Heavy and Civil Engineering Const.	\$28.5 mil	143	191	5,857	4.6	\$5,394	\$251
	238190	Other Foundation, Structure, and Building	\$12.0 mil.	26	35	1,145	3.9	\$2,802	\$109
	237310	Highway, Street, and Bridge Construction	\$28.5 mil	76	101	6,456	4.6	\$12,483	\$580
	238220	Plumbing, Heating, and Air-Conditioning	\$12.0 mil.	2	3	196	3.9	\$5,835	\$227
	237120	Oil and Gas Pipeline and Related Struct.	\$28.5 mil	16	21	1,457	4.6	\$6,822	\$317
	236210	Industrial Building Construction	\$28.5 mil	8	10	1,067	4.1	\$14,656	\$605
		Subtotal		1,576	1,803	40,839			
<b>Own Cranes But Do Not Rent Them</b>									
	238910	Site Preparation	\$12.0 mil.	3,019	3,019	28,252	4.1	\$1,228	\$50
	238110	Poured Concrete foundation and struct.	\$12.0 mil.	2,689	2,689	30,695	3.9	\$1,252	\$49
	238190	Other foundation, structure, building ext.	\$12.0 mil.	275	275	3,157	3.9	\$1,254	\$49
	237990	Other heavy and civil engg. Construction	\$28.5 mil	1,031	1,031	15,127	4.6	\$2,076	\$97
	238120	Structural steel and precast concrete	\$12.0 mil.	400	400	5,871	3.9	\$2,018	\$79
	238290	Other building equipment contractors	\$12.0 mil.	446	595	10,775	3.9	\$2,383	\$93
	237110	Water and Sewer Line Construction	\$28.5 mil	922	1,230	25,563	4.6	\$2,630	\$122
	237310	Highway, street and bridge construction	\$28.5 mil	835	1,114	39,183	4.6	\$7,266	\$338
	237120	Oil and gas pipeline construction	\$28.5 mil	104	138	5,345	4.6	\$8,167	\$380
	237130	Power and communication line const.	\$28.5 mil	450	600	39,834	4.6	\$5,769	\$268
	236210	Industrial building construction	\$28.5 mil	208	277	19,935	4.1	\$6,132	\$253
		Subtotal		10,378	11,367	223,738			
<b>Crane Lessees in the Construction Industry</b>									
	236210	Industrial building construction	\$28.5 mil	2,083	2,777	93,931	4.1	\$6,132	\$253
	237110	Water and Sewer Line Const.	\$28.5 mil	12,357	12,357	204,065	4.6	\$2,630	\$122
	237130	Power and communication line const.	\$28.5 mil	4,526	6,034	253,508	4.6	\$5,769	\$268
	237310	Highway, street and bridge const.	\$28.5 mil	8,429	11,239	434,714	4.6	\$7,266	\$338
	238110	Poured Concrete foundation and struct.	\$12.0 mil.	27,151	27,151	309,955	3.9	\$1,252	\$49
	238910	Site Preparation	\$12.0 mil.	30,496	30,496	285,430	3.9	\$1,228	\$48
	238190	Other foundation, structure, building, ext.	\$12.0 mil.	2,786	2,786	31,972	3.9	\$1,254	\$49
	237120	Oil and gas pipeline construction	\$28.5 mil	1,052	1,403	93,176	4.6	\$8,167	\$380
	237990	Other heavy and civil engg.	\$28.5 mil	10,502	10,502	154,071	4.6	\$2,076	\$97
	238290	Other building equipment cont.	\$12.0 mil.	4,565	6,087	126,559	3.9	\$2,383	\$93
	238120	Structural steel and precast concrete	\$12.0 mil.	4,321	4,321	78,266	3.9	\$2,018	\$79
		Subtotal		108,268	115,153	2,065,665			
		<b>Totals</b>		<b>123,621</b>	<b>134,455</b>	<b>2,369,089</b>			
Source: Office of Regulatory Analysis									
Revenue estimate for NAIC 238990 is a weighted value over three size classes (1-19, 20-49, and 50-99 employees)									

**Table 4**  
**Annualized Compliance Costs for Small Entities in Major Categories**

Category	NAIC	Industry	Number of Firms	Number of Estab.	Annualized Compliance Costs	Cost Per Estab.
<b>Crane Rental with Operators</b>						
	238990	All Other Specialty Trade Cont.	1,171	1,223	\$3,637,163	\$2,363
<b>Crane Rental without Operators (Bare Rentals)</b>						
	532412	Const./Min./For. Machine & Equip.	2,228	4,909	\$18,793,826	\$3,246
<b>Own and Rent Cranes with Operators</b>						
	236115	New Single-Family Housing Const.	168	168	\$92,093	\$548
	236118	Residential Remodelers	21	21	\$26,026	\$1,239
	238130	Framing Contractors	20	20	\$9,374	\$469
	238170	Siding Contractors	3	3	\$5,829	\$1,943
	238320	Painting and Wall Covering Contract.	20	20	\$45,208	\$2,260
	238150	Glass and Glazing Contractors	41	41	\$60,807	\$1,483
	238210	Electrical Contractors	12	12	\$45,915	\$3,826
	238910	Site Preparation Contractors	311	311	\$1,567,853	\$5,041
	238110	Poured Concrete Foundation and Struct.	263	263	\$1,393,680	\$5,299
	237130	Power and Communication Line and Rel.	36	36	\$230,017	\$6,389
	237110	Water and Sewer Line and Related Struct.	47	62	\$665,678	\$10,737
	238120	Structural Steel and Precast Concrete	239	319	\$2,149,285	\$6,738
	236220	Commercial and Institutional Building	21	28	\$302,780	\$10,814
	238290	Other Building Equipment Contractors	104	138	\$1,232,331	\$8,930
	237990	Other Heavy and Civil Engineering Const.	143	191	\$2,420,584	\$12,673
	238190	Other Foundation, Structure, and Building	26	35	\$230,430	\$6,584
	237310	Highway, Street, and Bridge Construction	76	101	\$2,962,085	\$29,328
	238220	Plumbing, Heating, and Air-Conditioning	2	3	\$41,127	\$13,709
	237120	Oil and Gas Pipeline and Related Struct.	16	21	\$336,584	\$16,028
	236210	Industrial Building Construction	8	10	\$344,306	\$34,431
		Subtotal	1,576	1,803	\$14,161,992	
<b>Own Cranes But Do Not Rent Them</b>						
	238910	Site Preparation	3,019	3,019	\$2,488,386	\$824
	238110	Poured Concrete foundation and struct.	2,689	2,689	\$2,216,588	\$824
	238190	Other foundation, structure, building ext.	275	275	\$226,786	\$824
	237990	Other heavy and civil engg. Construction	1,031	1,031	\$850,016	\$824
	238120	Structural steel and precast concrete	400	400	\$329,916	\$824
	238290	Other building equipment contractors	446	595	\$490,423	\$824
	237110	Water and Sewer Line Construction	922	1,230	\$1,013,573	\$824
	237310	Highway, street and bridge construction	835	1,114	\$918,193	\$824
	237120	Oil and gas pipeline construction	104	138	\$113,929	\$824
	237130	Power and communication line const.	450	600	\$494,462	\$824
	236210	Industrial building construction	208	277	\$228,105	\$824
		Subtotal	10,378	11,367	\$9,370,379	
<b>Crane Lessees in the Construction Industry</b>						
	236210	Industrial building construction	2,083	2,777	\$1,046,275	\$377
	237110	Water and Sewer Line Const.	12,357	12,357	\$4,655,680	\$377
	237130	Power and communication line const.	4,526	6,034	\$2,273,398	\$377
	237310	Highway, street and bridge const.	8,429	11,239	\$4,234,457	\$377
	238110	Poured Concrete foundation and struct.	27,151	27,151	\$10,229,536	\$377
	238910	Site Preparation	30,496	30,496	\$11,489,813	\$377
	238190	Other foundation, structure, building, ext.	2,786	2,786	\$1,049,666	\$377
	237120	Oil and gas pipeline construction	1,052	1,403	\$528,601	\$377
	237990	Other heavy and civil engg.	10,502	10,502	\$3,956,782	\$377
	238290	Other building equipment cont.	4,565	6,087	\$2,293,366	\$377
	238120	Structural steel and precast concrete	4,321	4,321	\$1,628,000	\$377
			108,268	115,153	\$43,385,574	
		Totals	123,621	134,455	\$89,348,934	

Source: Office of Regulatory Analysis

The cost estimates presented in the PIRFA are preliminary. In most cases, where the Agency had uncertainty about the estimates of proposed requirements, it opted for a very conservative costing approach so as to not omit or underestimate costs.

As a preliminary method of estimating the significance of the estimated costs on affected entities, OSHA compares, for each industry, the average cost of compliance for small entities with average small entity revenues and profits. This analysis, which OSHA terms a screening analysis, is a simple calculation of the costs as a percentage of profits and as a percentage of revenue. It is not a prediction that either revenue will increase by this percentage or that profits will fall by this percentage. Instead, this is a screening analysis for the potential significance of the economic impacts. In general, the issue of whether a fall in profits will actually occur as a result of incurring these costs is dependant on whether prices can be increased without major losses in revenue. For the "Crane Rental with Operators" category, the impact data is weighted by the number of small entities in each size class, which more appropriately averages the data. (All others contained revenue data where weighting the data was not necessary.)

Table 5 summarizes the potential economic impacts of the draft proposed standard on small firms, by industry. The estimated compliance costs represent less than a quarter of one percent of sales of small firms, in all industries in all major categories. For establishments that own cranes and rent them, compliance costs are about 0.23 percent (that is, less than 1 percent) of revenues. In all other industries, compliance costs are less than 0.16 percent of revenues.

**Table 5**  
**Economic Impacts of Small Entities in Major Categories**

Category	NAIC	Industry	Number of Firms	Number of Estabs.	Revenues Per Estab. (\$1,000)	Profits Per Estab. (\$1,000)	Cost Per Estab.	Cost as a Percent of Revenues	Cost as a Percent of Profits
<b>Crane Rental with Operators</b>									
	238990	All Other Specialty Trade Cont.	1,171	1,223	\$1,551	\$64	\$2,363	0.15%	3.72%
<b>Crane Rental without Operators (Bare Rentals)</b>									
	532412	Const./Min./For. Machine & Equip.	2,228	4,909	\$748	\$30	\$3,248	0.12%	3.08%
<b>Own and Rent Cranes with Operators</b>									
	236115	New Single-Family Housing Const.	168	168	\$233	\$10	\$548	0.23%	5.69%
	236118	Residential Remodelers	21	21	\$528	\$22	\$1,239	0.23%	5.69%
	238130	Framing Contractors	20	20	\$200	\$8	\$469	0.23%	6.03%
	238170	Siding Contractors	3	3	\$827	\$32	\$1,943	0.23%	6.03%
	238320	Painting and Wall Covering Contract.	20	20	\$962	\$37	\$2,260	0.23%	6.03%
	238150	Glass and Glazing Contractors	41	41	\$631	\$25	\$1,483	0.23%	6.03%
	238210	Electrical Contractors	12	12	\$1,629	\$63	\$3,826	0.23%	6.03%
	238910	Site Preparation Contractors	311	311	\$2,146	\$84	\$5,041	0.23%	6.03%
	238110	Poured Concrete Foundation and Struct.	263	263	\$2,256	\$88	\$5,299	0.23%	6.03%
	237130	Power and Communication Line and Rel.	36	36	\$2,720	\$128	\$6,389	0.23%	5.05%
	237110	Water and Sewer Line and Related Struct.	47	62	\$4,570	\$212	\$10,737	0.23%	5.05%
	238120	Structural Steel and Precast Concrete	239	319	\$2,868	\$112	\$6,738	0.23%	6.03%
	236220	Commercial and Institutional Building	21	28	\$4,603	\$190	\$10,814	0.23%	5.69%
	238290	Other Building Equipment Contractors	104	138	\$3,801	\$148	\$8,930	0.23%	6.03%
	237990	Other Heavy and Civil Engineering Const.	143	191	\$5,394	\$251	\$12,673	0.23%	5.05%
	238190	Other Foundation, Structure, and Building	26	35	\$2,802	\$109	\$6,584	0.23%	6.03%
	237310	Highway, Street, and Bridge Construction	76	101	\$12,483	\$580	\$29,328	0.23%	5.05%
	238220	Plumbing, Heating, and Air-Conditioning	2	3	\$5,835	\$227	\$13,709	0.23%	6.03%
	237120	Oil and Gas Pipeline and Related Struct.	16	21	\$6,822	\$317	\$16,028	0.23%	5.05%
	236210	Industrial Building Construction	8	10	\$14,656	\$605	\$34,431	0.23%	5.69%
		Subtotal	1,576	1,803					
<b>Own Cranes But Do Not Rent Them</b>									
	238910	Site Preparation	3,019	3,019	\$1,228	\$50	\$824	0.07%	1.65%
	238110	Poured Concrete foundation and struct.	2,689	2,689	\$1,252	\$49	\$824	0.07%	1.69%
	238190	Other foundation, structure, building ext.	275	275	\$1,254	\$49	\$824	0.07%	1.69%
	237990	Other heavy and civil engg. Construction	1,031	1,031	\$2,076	\$97	\$824	0.04%	0.85%
	238120	Structural steel and precast concrete	400	400	\$2,018	\$79	\$824	0.04%	1.05%
	238290	Other building equipment contractors	446	595	\$2,383	\$93	\$824	0.03%	0.89%
	237110	Water and Sewer Line Construction	922	1,230	\$2,630	\$122	\$824	0.03%	0.67%
	237310	Highway, street and bridge construction	835	1,114	\$7,266	\$338	\$824	0.01%	0.24%
	237120	Oil and gas pipeline construction	104	138	\$8,167	\$380	\$824	0.01%	0.22%
	237130	Power and communication line const.	450	600	\$5,769	\$268	\$824	0.01%	0.31%
	236210	Industrial building construction	208	277	\$6,132	\$253	\$824	0.01%	0.33%
		Subtotal	10,378	11,367					
<b>Crane Lessees in the Construction Industry</b>									
	236210	Industrial building construction	2,083	2,777	\$6,132	\$253	\$377	0.01%	0.15%
	237110	Water and Sewer Line Const.	12,357	12,357	\$2,630	\$122	\$377	0.01%	0.31%
	237130	Power and communication line const.	4,526	6,034	\$5,769	\$268	\$377	0.01%	0.14%
	237310	Highway, street and bridge const.	8,429	11,239	\$7,266	\$338	\$377	0.01%	0.11%
	238110	Poured Concrete foundation and struct.	27,151	27,151	\$1,252	\$49	\$377	0.03%	0.77%
	238910	Site Preparation	30,496	30,496	\$1,228	\$48	\$377	0.03%	0.79%
	238190	Other foundation, structure, building, ext.	2,786	2,786	\$1,254	\$49	\$377	0.03%	0.77%
	237120	Oil and gas pipeline construction	1,052	1,403	\$8,167	\$380	\$377	0.00%	0.10%
	237990	Other heavy and civil engg.	10,502	10,502	\$2,076	\$97	\$377	0.02%	0.39%
	238290	Other building equipment cont.	4,565	6,087	\$2,383	\$93	\$377	0.02%	0.41%
	238120	Structural steel and precast concrete	4,321	4,321	\$2,018	\$79	\$377	0.02%	0.48%
		Subtotal	108,268	115,153					
		<b>Totals</b>	<b>123,621</b>	<b>134,455</b>					

Source: Office of Regulatory Analysis

Table 5 also depicts the compliance costs as a percent of profits for potentially affected small firms. Compliance costs are generally expected to be passed through to some extent to customers as part of construction costs, and thus profits are not expected to decrease by these estimated amounts. However, these figures are presented here for illustrative purposes to provide perspective regarding the nature of the compliance costs. In all categories, the estimated costs are equal to or less than 6.03 percent of pre-tax profits. Most of the categories have impacts of less than 5 percent of pre-tax profits. However, because costs exceed 5 percent of pre-tax profits for some small entities in the Own and Rent category, OSHA procedures suggest a Panel process is appropriate.

In order to ensure that any significant impacts on subgroups of small establishments would be identified and considered, OSHA also separately assessed the potential impact of the draft proposed standard on very small employers, those with fewer than 20 employees in certain NAICs in the major categories. Estimating the number of these smallest employers and their revenue and profits was performed in the same manner as above for the SBA-defined small entities. Compliance costs as a percentage of revenue and profits for these small size employers are presented in Table 6.

As shown in Table 6, the estimated compliance costs represent less than one quarter of one percent of sales of very small establishments in all industries. Only in industries that own and rent cranes are compliance costs as much as 0.23 percent of revenues. Table 6 also depicts compliance costs as a percent of profits for potentially affected very small firms. As stated above, compliance costs are generally expected to be passed through to customers as part of the construction costs to some extent, and thus profits are not expected to actually be reduced by the

**Table 6**  
**Economic Impacts for Very Small Entities (1-19 Employees) by Major Category**

Category	NAIC	Industry	Number of Very Small		Revenues	Profits	Cost	Cost as a	Cost as a
			Firms	Estabs.	Per Estab. (\$1,000)	Per Estab. (\$1,000)	Per Estab.	Percent of Revenues	Percent of Profits
<b>Crane Rental with Operators</b>									
	238990	All Other Specialty Trade Cont.	1,013	1,013	\$614	\$25	\$949	0.15%	3.77%
<b>Crane Rental without Operators (Bare Rentals)</b>									
	532412	Const./Min./For. Machine & Equip.	2,228	4,909	\$748	\$30	\$922	0.12%	3.08%
<b>Own and Rent Cranes with Operators</b>									
	236115	New Single-Family Housing Const.	168	168	\$233	\$10	\$548	0.23%	5.69%
	236118	Residential Remodelers	21	21	\$528	\$22	\$1,239	0.23%	5.69%
	238130	Framing Contractors	20	20	\$200	\$8	\$469	0.23%	6.03%
	238170	Siding Contractors	3	3	\$827	\$32	\$1,943	0.23%	6.03%
	238320	Painting and Wall Covering Contract.	20	20	\$962	\$37	\$2,260	0.23%	6.03%
	238150	Glass and Glazing Contractors	41	41	\$631	\$25	\$1,483	0.23%	6.03%
	238210	Electrical Contractors	12	12	\$1,629	\$63	\$3,826	0.23%	6.03%
	238910	Site Preparation Contractors	311	311	\$2,146	\$84	\$5,041	0.23%	6.03%
	238110	Poured Concrete Foundation and Struct.	263	263	\$2,256	\$88	\$5,299	0.23%	6.03%
	237130	Power and Communication Line and Rel.	36	36	\$2,720	\$126	\$6,389	0.23%	5.05%
		Subtotal	895	895					
<b>Own Cranes But Do Not Rent Them</b>									
	238910	Site Preparation	3,019	3,019	\$1,228	\$50	\$824	0.07%	1.65%
	238110	Poured Concrete foundation and struct.	2,689	2,689	\$1,252	\$49	\$824	0.07%	1.69%
	238190	Other foundation, structure, building ext.	275	275	\$1,254	\$49	\$824	0.07%	1.68%
	237990	Other heavy and civil engg. Construction	1,031	1,031	\$2,076	\$97	\$824	0.04%	0.85%
	238120	Structural steel and precast concrete	400	400	\$2,018	\$79	\$824	0.04%	1.05%
		Subtotal	7,414	7,414					
<b>Crane Lessees in the Construction Industry</b>									
	237110	Water and Sewer Line Const.	12,357	12,357	\$2,630	\$122	\$377	0.01%	0.31%
	238110	Poured Concrete foundation and struct.	27,151	27,151	\$1,252	\$49	\$377	0.03%	0.77%
	238910	Site Preparation	30,496	30,496	\$1,228	\$48	\$377	0.03%	0.79%
	238190	Other foundation, structure, building, ext.	2,786	2,786	\$1,254	\$49	\$377	0.03%	0.77%
	237990	Other heavy and civil engg.	10,502	10,502	\$2,076	\$97	\$377	0.02%	0.39%
	238120	Structural steel and precast concrete	4,321	4,321	\$2,018	\$79	\$377	0.02%	0.48%
			87,613	87,613					
		<b>Totals</b>	<b>99,163</b>	<b>101,844</b>					

Source: Office of Regulatory Analysis

entire estimated costs. However, we present these figures for illustrative purposes. In all categories, compliance costs are equal to or less than 6.03 percent of pre-tax profits.

### Summary of Reporting, Recordkeeping, and Other Compliance Requirements

As described above, the requirements of the draft proposed standard that are expected to involve significant compliance costs can be grouped into four categories: assembly/disassembly; power line safety; crane inspections; and test preparation and test costs for operator certification/qualification. Included in these provisions are requirements to produce and maintain certain written records. The specific nature of the recordkeeping requirements, and the costs and burden hours associated with these requirements, are listed below in Table 7.

**Table 7**  
**Unit Cost Assumptions of the Cranes and Derricks Draft Proposed Standard**

Section	Requirement	Incremental Time	Employee Type (Wage)
Assembly/Disassembly (All Cases)	Assess possible power line issues and ground conditions	30 minutes per assessment (15 minutes each)	AD Supervisor (\$36.22)
Power Line Safety - Assembly/Disassembly (Near Power Lines) (Estimated as 25% of Cases)	Line Contact Determination	15 minutes per incidence	Qualified Person (\$36.33)
	Planning Meeting & Voltage Information Request	20 minutes	AD Supervisor (\$36.22) Operator (\$31.37) Rigger (\$18.59) Employee (\$16.16)
	A dedicated spotter is needed	2 hours per incident	Employee
	Spotter training	15 minutes (each)	Employee, AD Supervisor
Power Line Safety - Operations (Option 2 or 3) - Occurs in 30% of the jobs where cranes were	Elevated Warning Line	15 minutes	Employee
	Planning Meeting & Voltage Information Request	20 minutes	Supervisor, Operator, Rigger, Employee

not assembled near a power line (75%).	Proximity Alarm/Other Operational Aids (25 % of Incidents)	0 minutes	Crane Operator
	Dedicated Spotter (75% of Incidents)	4 hours Per Incident	Employee
		15 minutes (instruction)	Employee, Supervisor
Power Line Safety – Operations (Closer Than Table A) Occurs in the 5% of the jobs where cranes were not assembled near a power line (75%).	Minimum Clearance Determination	1 hour	Professional Engineer (PE) (\$63.59)
	Planning Meeting	2 hours	Power Line Owner (\$63.59) and PE
	Dedicated Spotter	4 hours	Employee
	Elevated Warning Line	15 minutes	Employee
	Equipment Grounding	30 minutes	PE
	Insulating Link	\$427 (Annualized Cost)	
	Written Procedures	Developed during planning meeting	
	Barricades	15 minutes	Employee
	Limit Access	Discussed during instruction/training	
	Non-Conductive Rigging	Already being done	
	Deactivate Automatic Re-energizer	30 minutes	Line Owner or PE
Crane Inspections	Monthly Inspection	15 minutes per crane in addition to current time spent (includes 2 minutes per crane for recordkeeping)	Competent Person
	Annual Inspection	15 minutes per crane in addition to current time spent (includes 2 minutes per crane for recordkeeping)	Qualified Person
	Repair Inspections	15 minutes per crane (includes 2 minutes per crane for recordkeeping)	Qualified Person

Crane Enhancements	New Lattice-Boom cranes shall be equipped with walkways on the booms	0 minutes	Manufacturer
Operator Training for Certification/Qualification	Train operators	<p>Wages for operator's training time (16 hours) for a 2-day course with examination.</p> <p>Also, the cost for a 2-day course (\$7,200) divided by 15 employees per class or about \$480 per person. OSHA used an estimate of \$500 per person. This estimate includes 2 minutes for recordkeeping. In addition to these costs, the cost for the actual examination average about \$250 per person.</p> <p>This totals about \$1,251 per person (not annualized).</p>	

Source: Office of Regulatory Analysis

### Cost Methodology

OSHA estimated the cost of complying with the provisions in the proposed draft standard for small entities by grouping provisions into categories. The total costs for a category resulted from the number of affected establishments in the category and the level of current compliance with the provision in the draft proposed standard. Levels of current compliance were used in estimating the costs for crane inspections and operator certification/qualification. There are four major categories in this proposed standard where employers are estimated to incur significant compliance costs. Those categories are: 1) Assembly and Disassembly; 2) Crane Operations; 3) Crane Inspections; 4) Operator Certification/Qualification. The following paragraphs outline the approach that OSHA used in the cost analysis and describe the cost methodology.

### Assembly/Disassembly

The Agency estimates that all of the estimated 91,997 cranes would be brought to a new site or job on average four times annually. This would total about 368,000 crane jobs annually. This estimate includes approximately 72,000 jobs performed by companies that own their own crane. The draft proposed standard requires that prior to assembly and use, employers must assess ground conditions and site conditions, which include power lines. To perform these assessments, OSHA estimates that 30 minutes of Assembly/Disassembly (AD) Supervisor time would be needed for each task. While there are requirements for disassembly, the Agency estimates that the majority of the costs will be incurred during the assembly process. Thus, for purposes of this analysis, OSHA is not including any disassembly costs.

### Assembly/Disassembly Near Power Lines

The Agency estimates that 25 percent of all crane jobs (uses) would require the crane being assembled or disassembled near a power line. When assembling/disassembling near power lines the employer would be required to determine if any part of the crane, load line or load (including rigging and lifting accessories), if operated up to the crane's maximum working radius in the work zone, could get closer than 20 feet to a power line, which will take 15 minutes of qualified person's time. If so, the employer must choose from 3 options: (1) deenergize and visibly ground the power line, or (2) maintain the 20 foot clearance, or (3) contact the utility owner/operator to get the line voltage and maintain the appropriate Table A distance. The employer is then required to maintain the appropriate distance by implementing several encroachment procedures required to ensure that the crane doesn't become energized by power lines. These encroachment measures include, among other things, a designated spotter or

proximity alarm. For the purposes of the costing, the Agency estimated that a designated spotter would be used in 75 percent of the cases; while a proximity alarm would be used in the remaining 25 percent of the cases. The Agency estimates that the spotter use would be an average of 2 hours per incident and that 25 percent of cranes are already equipped with proximity alarms. The Agency assumes that in 25 percent of the incidents the crane is already equipped with a proximity alarm (no cost to employer) and the operator would use the proximity alarm instead of a dedicated spotter. Thus, the Agency did not estimate compliance costs for proximity alarms.

#### *Crane Operations (Near Power Lines Under Option 2 or 3)*

For cranes that are not assembled or disassembled near power lines (75% of the crane jobs), there are times when those cranes will have to work closer than 20 feet to a power line thus triggering encroachment precautions in the draft proposed standard (30 percent of the 75% of all crane jobs not assembled near a power line).

Under the draft proposed standard, employers are required to either: (1) mark the work zone with flags, or use a device such as a range limiting device or range control warning device which prohibits the operator from operating the crane past those boundaries, or (2) define the work zone as the area 360 degrees around the crane based on the crane's maximum working radius. The Agency estimates that in most cases the least cost option is to mark the zone by flags. Based on the defined work zone, the employer is then required to determine whether the crane (load, or load line) could get closer than 20 feet to a power line. The Agency estimates that it will take a qualified person about 15 minutes to mark the work zone with flags and then determine whether the crane could come closer than 20 feet to a power line.

Under Option (2), the employer must take measures to ensure they maintain a 20 foot clearance distance. Under Option (3) they must contact the utility owner/operator to determine the voltage and maintain an approach distance appropriate to that voltage, as set forth in Table A of the draft proposed standard (Table A distances are mostly shorter than 20 feet). However, whether the employer elects to maintain the 20 foot clearance distance or the Table A distance, the employer is required to implement certain preventive encroachment measures, including having a planning meeting with the operator and other workers who will be in the area of the crane; erect an elevated warning line; and use either a proximity alarm; operational aids/limiting devices; dedicated spotter or an insulating link. For the purposes of this analysis, the Agency assumed that employers would use a dedicated spotter (4 hours per incidence on average) (75 percent of the cases) or one of the operating devices (25 percent of the cases). More spotter time is needed under option 2 or 3 as opposed to the 2 hours the Agency assumed with regard to assembly/disassembly near power lines. The Agency did not assume that an employer would use an insulating link in this portion of the costing. Insulating links are only assumed to be used in cases where employers are working closer than the allowance distances outlined in Table A of the regulatory text.

#### *Crane Operations (Closer Than Table A Distances)*

The draft proposed standard allows employers to operate cranes closer than the minimum approach distances outlined in Table A (see discussion below). The Agency estimates that the remaining 5 percent of the crane jobs (of the 35 percent that will operate close to a power line while not assembled near one) are required to do the following: 1) minimum clearance determination (1 hour of professional engineer time); 2) planning meeting (2 hours each of line

owner time and professional engineer time); 3) dedicated spotter (4 hours per incidence); 4) elevated warning line (15 minutes of laborer time); 5) insulating link (\$427 annualized cost), 6) equipment grounding (30 minutes of engineers time), 7) written procedures (developed during the meeting between the line owner and the professional engineer), 8) barricades (15 minutes of laborer time), 9) limit access to employees (communicated in the training and the use of barricades), 10) non-conductive rigging (already being done under consensus standards and current industry practice), and 11) deactivate automatic re-energizer (30 minutes for the line owner or professional engineer). All of these precautionary methods are required and not optional.

#### Crane Inspections

The draft proposed standard requires several crane inspections. The Agency did not attribute any costs to daily visual inspections because these are already required in some instances, and are a common industry practice. However, monthly, annual, and repair inspections will result in some incremental compliance costs attributable to the proposed standard.

Depending upon the type of crane, the current standard already requires that some items be inspected on a monthly basis and that those inspections be documented; further, the current standard requires documented annual inspections. However, the Agency estimates that additional measures outlined in the draft proposed standard would result in some incremental cost increase. Thus, the Agency estimates an additional 15 minutes per crane for each type of inspection (including time spent for recordkeeping) is needed to comply with the additional measures in the draft proposed standard; the Agency estimates competent person time for the

proposed monthly inspection and qualified person time for the proposed annual inspection. (A competent person is capable of identifying hazards and has authority to take prompt action to correct hazards. A qualified person has extensive expertise to recognize safety hazards and know how to solve them. See definitions in Section 1401.)

OSHA also estimates that employers would incur a cost to re-inspect cranes that have been repaired. The Agency estimates that 10 percent of the total number of cranes would be repaired (or 9,200 cranes). The Agency further estimates that an additional 15 minutes of qualified person time would be needed to re-inspect the crane. The 15 minutes is incremental as employers are already performing some kind of equipment re-inspection to ensure that the equipment is safe to operate.

#### Fall Protection (Lattice Boom Crane Enhancements)

The draft proposed standard requires equipment manufactured after January 1, 2008, with lattice booms to be equipped with walkways on the boom(s) if the vertical profile of the boom is 6 or more feet. The Agency estimates that installing walkways in the manufacturing process of new cranes (other than tower cranes which are not subject to this requirement) would cost about \$4,000 per crane. There is no requirement in the draft proposed standard for employers to retrofit existing cranes with walkways. Thus, the Agency has not estimated compliance costs for this requirement.

#### Operator Certification

The draft proposed standard requires operators to be certified or qualified. OSHA estimates that there are approximately 107,000 crane operators working at any one time in the

construction industry. This estimate is based on estimating one operator for each crane in all crane using sectors, and one operator per four cranes in firms that rent cranes without operators. In addition, OSHA estimated a 23 percent annual turnover in crane operators, and that this turnover would require certification of new operators. This may be an overestimate because some of the turnover will be among already certified crane operators. Also, the Agency conducted a sensitivity analysis to estimate the impacts of doubling the number of operators per crane and turnover rate. This would increase the costs of the rule by \$44 million per year. Qualified maintenance personnel are allowed to operate the equipment in the course of maintenance work only and do not need to be certified/qualified operators. While the current standards require operators to be trained, the draft proposed standard goes into detail as to what operators are required to know and understand. Of the total number of operators, the Agency estimates that 70 percent of operators would need to be certified or qualified. The remainder would already be certified as a result of existing state and local requirements.

The Agency used the least cost option where employees would attend a 2 day test preparation course and take the necessary examinations to be certified to operate the crane. This method would total about \$1,252 per operator (not annualized); this reflects the total cost of the course, test, recordkeeping, and wages for operator training time. The Agency also estimates that 15 percent of the total number of operators needing certification would need to retake the test preparation course and another 8 percent would need to be recertified due to employee turnover. These estimates include the time needed to develop and retain certification records.

Table 8 presents the costs by major provision in the draft proposed standard. The total annualized compliance costs are about \$90 million.

<b>Table 8</b>	
<b>Annualized Compliance Cost by Major Provision in the Draft Proposed Standard</b>	
<b>Major Requirement</b>	<b>Annualized Compliance cost</b>
Assembly/Disassembly	\$13,753,622
Power Line Safety	\$12,913,882
Crane Inspections	\$18,431,513
Operator Certification and Qualification	\$44,249,916
<b>Total</b>	<b>\$89,348,934</b>
Source: Office of Regulatory Analysis	

**Federal Rules That May Duplicate, Overlap or Conflict with the Proposed Rules**

One of the purposes of the draft proposed standard is to establish consistency in providing protection from the hazards working with or around cranes or derricks in the construction industry. While cranes and derricks are used in the general and maritime industries, their use in the construction industry is unique. The draft proposed standard is designed to complement and be consistent with other potentially applicable OSHA standards, including those addressing training, fall protection, and personal protective equipment.

No other Federal rules that might duplicate, overlap or conflict with the draft proposed standard have been identified.

## **Alternatives**

OSHA and C-DAC considered various options to some of the provisions in the draft proposed standard. These options to the provisions are discussed below, followed by C-DAC and OSHA's reasoning for not adopting the alternative.

(1) *Operator Qualification and Certification.* An alternative considered was to not require third-party certification of crane operators within the proposed rule; instead qualification criteria would be set out in the standard, which the employer would be required to meet. C-DAC rejected this alternative and instead required that employers meet one of the following four options for crane operator certification: third-party certification; employer certification with third-party audit; U.S. military certification; or licensing by a government entity.

There was consensus among the Committee that OSHA's general construction training requirement has for many years required employers to ensure that operators are adequately trained, and that nonetheless there are too many operators with an insufficient level of operator competence. Thus, the Committee concluded that the certification requirements were necessary to protect employees. For the purposes of costing this draft proposed standard, OSHA does not include the costs of training already required by the existing standard. Therefore, in this cost analysis, we take as a baseline that operators have considerable training and only need supplementary training to pass examinations necessary to receive certification/qualification.

*(2) Power Line Safety – Procedures/Protections.*

(a) One alternative considered in this section was doubling the prohibited crane operation zone from the 10 feet currently required by 29 C.F.R. 1926.550 to 20 feet. Instead, C-DAC adopted a 20 foot trigger for preventive measures.

A doubling of the prohibited zone was rejected by the Committee over concerns that it would not address the root causes of why cranes get too close to power lines. Specifically, the consensus in the Committee was that most power line contacts occur when operators accidentally move the crane within the prohibited zone because either (1) the operator cannot accurately gauge the distance from the boom (or load line) to the line, or (2) the operator loses track of the lines' location and forgets that a line is there; this sometimes happens when an operator moves the crane in a direction that he/she had not originally planned on using.

As a result, the Committee selected an approach that focuses on measures that remind the operator of the location of the line and give the operator visual markers that can be used to accurately assess distances. The compliance costs are based on the protective measures that employers are required to take to ensure the distances are maintained and the power lines are not contacted.

(b) A second alternative considered was to prohibit crane operations within the Table A zone. As described above, C-DAC decided to permit such operations if employers follow certain protective measures/precautions.

The Committee rejected the idea of a complete prohibition against entering the Table A zone because, in its view, it is unrealistic to expect that employers would comply with such a prohibition in certain instances. The Committee believed that it would be better to specify how to do such work safely. The Agency estimates that a small percentage of crane operations occur

within the Table A zone. Prohibiting work within this zone would sacrifice productivity, although it would decrease the costs associated with compliance with the draft proposed standard; about a \$12 million reduction in annualized compliance cost.

(c) A third alternative considered was to require insulating links on all cranes being operated near power lines. C-DAC decided to require insulating links on cranes operating within the Table A zone and as an optional protective measure for employers working outside the Table A zone and near power lines that are not de-energized and grounded.

The Committee was of the view that use of insulating links in all instances was an unnecessarily restrictive approach when operating outside the Table A zone. It felt that there are other, equally protective measures that could be used instead. Since the majority of cranes are rented, requiring insulating links on cranes in all instances would significantly increase annualized compliance costs. Since there are an estimated 91,997 cranes and insulating links cost about \$6,903 on average (Pratt, 2003) (this is the cost of fitting new cranes with an insulating link during production). The cost of retrofitting a crane with an insulating link is \$12,598 per crane. This would approximately double the total annualized compliance cost.

(3) *Scope.* C-DAC considered including only a functional definition of a crane or providing only a list of equipment included within the scope of the draft proposed standard. Instead, C-DAC decided to use a "hybrid-approach" in defining a crane, providing both a functional definition and a list of included equipment.

The Committee rejected the concept of using only a functional definition because this might include equipment that the draft proposed standard was not designed to address (for example, equipment that poses a different set of hazards than those addressed by the standard).

The Committee also rejected the idea of relying solely on a list of equipment because (1) some equipment might be inadvertently left off the list, and (2) a list might limit the application of the standard to existing technology, and thus exclude future technology with essentially the same hazards as existing machines from the draft proposed standard's coverage. The Agency has used a reasonable estimate for the number of cranes affected by the draft proposed standard. OSHA assumes that even adopting a specific list of equipment would not change the estimate used in the cost analysis.

(4) *Ground Conditions – Responsibility.* The alternative considered in this section was to place responsibility on the crane operator's employer for ensuring adequate ground conditions. C-DAC rejected this alternative and instead placed responsibility on the controlling entity.

The Committee believed that a major problem in the industry is inadequate ground conditions. Making the crane operator's employer responsible for ground conditions was considered impractical, since that employer typically has neither the authority to make changes to the site nor the equipment necessary to correct ground conditions. In contrast, the Committee believed that the controlling entity is in the best position to make the arrangements necessary to make the ground conditions adequate for crane operations. The costs developed are costs to comply with the draft proposed standard. If the Agency adopted this alternative; the costs would still be the same; they would simply be placed on a different employer.

## SUPPLEMENTAL EXPLANATION OF INDUSTRIAL PROFILE DATA

This document contains the methodology OSHA used to estimate the number of firms, establishments, employees, revenues, profits, cranes, and operators for each major category used in the PIRFA. This information is to be used with the Bureau of the Census data (attached).

### Crane Rental with Operators (NAIC 238990)

Based on the SBA definition (less than \$12 million), the number of establishments and revenues was taken from a special data runs from the Bureau of the Census (CB). The data included establishments, revenues, and employees. The data for this category was broken down into the following categories: 1-19, 20-49, 50-99, 100-249, 250-499, and >500 employees. The Agency divided the number total revenues per size class by the total establishments per size class to equal average revenue per establishment per size class. Those establishments with average revenue per establishment less than the SBA definition were considered small and used in the PIRFA. Those considered small were establishments with less than 100 employees.

The CB data did not report estimates of firms. Thus, the Agency assumed a 1:1 ratio of establishment to firms in the 1-19 size class. The Agency multiplied the number of establishments by seventy-five percent to get an estimate of firms.

The profits were calculated using profit rates taken from the 2002 Source Book Statistics of Income published by the Internal Revenue Service. The Agency multiplied the profit rate by the revenues to equal the estimated profits.

Dividing the revenues per establishment by \$400,000 derived the estimate of cranes. The Agency estimated that each crane would generate about \$400,000 in annual revenue. The Agency used a 1:1 ratio of crane-to-crane operator for this category. Since establishments in this category rent cranes with operators, this ratio seemed reasonable.

### Crane Rental without Operators (NAIC 532412)

The CB data did not report any data on establishments in this category. Based on the SBA definition (less than \$6 million), the number of establishments, employees, and revenues were taken from Dunn and Bradstreet (2002). The data for this category was broken down into the following categories: 1-19, 20-49, 50-99, 100-249, 250-499, 500-999, and >1,000 employees. The Agency divided the number total revenues per size class by the total establishments per size class to equal average revenue per establishment per size class. Those establishments with average revenue per establishment less than the SBA definition were considered small and used in the PIRFA. Those considered small were establishments with less than 20 employees.

The Dunn and Bradstreet data did not report estimates of firms. Thus, OSHA used 2002 SBA data for firms in the 1-19 size class (the only size class in this category considered small by SBA).

The profits were calculated using profit rates taken from the 2002 Source Book Statistics of Income published by the Internal Revenue Service. The Agency multiplied the profit rate by the revenues to equal the estimated profits.

Dividing the revenues per establishment by \$250,000 derived the estimate of cranes. The Agency estimated that each crane would generate about \$250,000 in annual revenue. The Agency used a 4:1 ratio of crane-to-crane operator for this category. Since establishments in this category rent cranes without operators, this ratio seemed reasonable.

#### Own and Rent Cranes with Operators

The CB data reported data on establishments that own cranes and rent them part-time with operators. The data included establishments, revenues, and employees. The NAICs listed are those that CB reported having reported percentages of crane rental revenues (with crane rental not being their main area of business). These NAICs had different small business definitions (ranging from less than \$12 million to less than \$28.5 million). The Agency used total revenues, not only crane rental revenues in the PIRFA. The Agency divided the total revenues per NAIC by the number of establishments to equal the revenues per establishment per NAIC. For this category, those NAICs that averaged revenues per establishment less than their corresponding SBA definition were used in the PIRFA (these are listed in Table 3 of the PIRFA).

The CB data did not report estimates of firms. Thus, OSHA divided the total number of employees by the number of establishments per NAIC to get the average number of employees per establishment. Thus, the Agency assumed a 1:1 ratio of establishment to firms for those establishments that averaged less than 20 employees. For all others, the Agency multiplied the number of establishments by seventy-five percent to get an estimate of firms.

The profits were calculated using profit rates taken from the 2002 Source Book Statistics of Income published by the Internal Revenue Service. The Agency multiplied the profit rate by the revenues to equal the estimated profits.

Dividing the revenues per establishment by \$400,000 derived the estimate of cranes. The Agency estimated that each crane would generate about \$400,000 in annual revenue. The Agency used a 1:1 ratio of crane-to-crane operator for this category. Since establishments in this category rent cranes with operators, this ratio seemed reasonable.

### Own Cranes But Do Not Rent Them

Using those NAICs that own cranes and rent them, the Agency subtracted those establishments (own and rent cranes) from the total number of construction firms per NAIC. This was then multiplied by 10 percent to get an estimate of the number of establishments that own cranes but do not rent them. Since most cranes in construction are leased, ten percent seemed a reasonable estimate of establishments that own cranes but do not rent them. CB provided estimates of establishments and revenues for construction firms per NAIC. For this category, those NAICs that averaged revenues per establishment less than their corresponding SBA definition were used in the PIRFA (these are listed in Table 3 of the PIRFA).

To estimate the number of firms, the Agency used employment data from the Economic Census (2002) to estimate the average number of employees per establishment. Thus, the Agency assumed a 1:1 ratio of establishment to firms for those establishments that averaged less than 20 employees. For all others, the Agency multiplied the number of establishments by seventy-five percent to get an estimate of firms.

The profits were calculated using profit rates taken from the 2002 Source Book Statistics of Income published by the Internal Revenue Service. The Agency multiplied the profit rate by the revenues to equal the estimated profits.

The estimate of cranes was derived by assuming that each establishment would own on average 1 crane. The Agency used a 1:1 ratio of crane-to-crane operator for this category. Since establishments in this category do not rent cranes with operators, this ratio seemed reasonable.

### Crane Lessees

Since most of the construction work involves cranes that are leased, the Agency provides estimates of establishments (primarily engaged in heavy construction work) that lease cranes both with and without operators. These NAICs are presented in Table 3 of the PIRFA with their corresponding SBA definitions. The employee counts were taken from the 2002 Economic Census for each of these NAICs. Since the CB data provided revenues per establishment, the Agency used only those establishments the fell with their corresponding SBA definition in the PIRFA.

To estimate the number of firms, the Agency used employment data from the Economic Census (2002) to estimate the average number of employees per establishment. The Agency assumed a 1:1 ratio of establishment to firms for those establishments that averaged less than 20 employees. For all others, the Agency multiplied the number of establishments by seventy-five percent to get an estimate of firms.

The profits were calculated using profit rates taken from the 2002 Source Book Statistics of Income published by the Internal Revenue Service. The Agency multiplied the profit rate by the revenues to equal the estimated profits.

The Agency totaled the estimates of cranes from the previous four categories (Crane Rental with Operator, Crane Rental without Operator, Own but Do Not Rent, and Own and Rent with Operator) to get an estimated total number of cranes in the construction industry. [Specifically, OSHA totaled 5,886 (Crane Rental with Operator), 59,674 (Crane Rental without Operator), 11,367 (Own but Do Not Rent), and 15,070 (Own and Rent with Operator) which equals 91,997 cranes.] Using the estimate of 91,997 cranes in the construction industry, the Agency subtracted out those cranes that are owned by not rented out (11,367) to get an estimate of the cranes that are rented to the crane lessees (about 80,630). This 80,630 is the total number of cranes available for lease across construction firms. To estimate the number of lease agreements per NAIC for these 80,630 cranes, OSHA divided the number of establishments per NAIC by the total number of establishments in this category and multiplied that product by 80,630. OSHA assumed that each leased crane would be used for 4 crane jobs on average.

Using the estimates of the cranes from 3 of the previous 4 categories (rent with operators, rent without operators, own and rent with operators), OSHA concluded that among the cranes that are rented 74 percent are rented without operators and 26 percent with operators. This percentage was used to determine the costs for operator certification.



**Table -- SHARE OF TOTAL CRANE RENTAL (WITH OPERATOR) BUSINESS CAPTURED BY  
NAICS Construction Industry Categories**

(thousands of dollars unless otherwise noted)

Construction Industry Category	Number of Establishments	Total number of employees	Value of business done	Value of construction work --Crane Rental Rev.1	Share of Total Crane Rental (with Operator) Business
Masonry Contractors	1				0.00%
Roofing Contractors	3				0.00%
Finish Carpentry Contractors	2				0.00%
Framing Contractors	20	120	\$3,890	\$40	0.00%
Residential Remodelers	21	45	\$11,078	\$180	0.01%
Plumbing, Heating, and Air-Conditioning Contractors	3	196	\$17,506	\$306	0.01%
Electrical Contractors	12	176	\$19,544	\$596	0.03%
Glass and Glazing Contractors	41	328	\$25,883	\$637	0.03%
Siding Contractors	3	18	\$2,481	\$794	0.03%
Painting and Wall Covering Contractors	20	159	\$19,243	\$962	0.04%
Other Foundation, Structure, and Building Exterior Contractors	35	1,145	\$98,084	\$4,093	0.17%
Commercial and Institutional Building Construction	28	757	\$128,880	\$5,894	0.25%
Water and Sewer Line and Related Structures Construction	62	1,432	\$283,350	\$7,233	0.30%
Power and Communication Line and Related Structures	36	666	\$97,908	\$8,983	0.38%
Industrial Building Construction	10	1,067	\$146,556	\$12,860	0.54%
Oil and Gas Pipeline and Related Structures	21	1,457	\$143,269	\$13,695	0.58%
Poured Concrete Foundation and Structure Contractors	263	4,328	\$593,228	\$17,861	0.74%
Site Preparation Contractors	311	4,706	\$667,366	\$37,743	1.59%
Highway, Street, and Bridge Construction	101	6,456	\$1,260,829	\$52,097	2.19%
Other Building Equipment Contractors	138	4,076	\$524,549	\$76,090	3.20%
Structural Steel and Precast Concrete Contractors	319	7,389	\$914,856	\$80,503	3.39%
Other Heavy and Civil Engineering Construction	191	5,857	\$1,030,336	\$114,436	4.82%
<b>Total -Not Specializing in Crane Rentals with Operators, but engaged in Construction</b>	<b>1,641</b>	<b>40,378</b>	<b>\$5,988,936</b>	<b>\$434,803</b>	<b>18.30%</b>
<b>238990, All Other Specialty Trade Contractors -- Crane Rental with Operators Companies</b>	<b>1,240</b>	<b>16,244</b>	<b>\$2,377,981</b>	<b>\$1,941,431</b>	<b>81.70%</b>
<b>Value of Total Crane Rental (with Operators) Business</b>				<b>\$2,376,234</b>	<b>100.00%</b>
<small>1 Value of Construction Work</small>					
<small>The value of construction work for this tabulation is based on the percentage reported for rental of cranes with operators of the total value of business done.</small>					
<b>SOURCE:</b>					
<small>UNPUBLISHED DATA Bureau of the Census Department of Commerce, Washington, DC 20233 2002 Economic Census - Construction Special tabulation of Rental of Cranes with Operators</small>			<small>[Thousands dollars unless otherwise noted. Detail may not add to total because of rounding. Data based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this tabulation contain sampling errors and nonsampling errors.]</small>		