

**Telecommunications Towers Small Business Advocacy Review Panel Small Entity
Representative Issues Document
Summer, 2018**

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1. Background

Recognizing a critical need to address the root causes of the high fatality rate in the telecommunications tower industry, OSHA published a Request for Information (RFI) on Communication Tower Safety in 2015 to solicit information about the hazards to which telecommunications tower workers are exposed as well as safe work practices implemented within the industry to address those hazards. OSHA received over 900 individual responses to the RFI questions and has continued to engage the industry in discussions on those topics during site visits, meetings/conference calls with stakeholders, public workshops in collaboration with the Federal Communications Commission (FCC), and at other stakeholder outreach venues.

The construction and maintenance of telecommunications towers is highly specialized work. This work often involves workers climbing towers via ladders or being hoisted to workstations on the tower via base-mounted drum hoists. New towers are constructed piece by piece; workers bolt each section or piece into place before raising the next section. Tower sections or structural parts are hoisted to their elevated positions using a crane or base-mounted drum hoist, with or without a gin pole. After towers are erected, related construction activities include reinforcing the structure, upgrading antennas, and installing new antennas on existing towers (referred to as collocation). Workers also climb telecommunications towers to perform maintenance activities such as painting structural steel members, changing light bulbs, and troubleshooting

malfunctioning equipment. During the performance of work activities involving telecommunications towers in general, workers are exposed to a variety of serious hazards including: falls, structural collapses, struck-by hazards, worker fatigue, radio frequency exposure, inclement weather (including extreme heat and cold), electrical, and cuts and lacerations due to the use of sharp, heavy tools and materials.

To further examine telecommunications tower safety, OSHA has convened a Small Business Advocacy Review (SBAR) Panel under the Small Business Regulatory Enforcement Fairness Act. The SBAR panel has several purposes. First, the Panel provides an opportunity for affected small employers to provide comments to OSHA in advance of a formal rulemaking process. Second, by reviewing OSHA's potential provisions that may be included in a telecommunications towers standard and estimates of the potential impacts of that rule, Small Entity Representatives (SERs) and the Panel can offer recommendations to OSHA on ways to tailor the rule to make it more cost effective and less burdensome for affected small entities. Third, early comments permit identification of different regulatory alternatives the agency might consider. Finally, the SBAR Panel report can provide specific recommendations for OSHA to consider on issues such as reporting requirements, timetables of compliance, and whether some groups, including small entities, should be exempt from any proposed rule.

This document contains a brief discussion of each topic OSHA is considering including in a proposed rule and initial estimates of the unit costs of complying with those provisions. This document also presents potential regulatory alternatives (both those that reduce burdens on small entities and are considered significant alternatives under the Regulatory Flexibility Act and those that may increase burdens) and questions for SERs. This issues document is meant to serve as both a summary of the longer Preliminary Initial Regulatory Flexibility Analysis (PIRFA) and as a discussion guide for SERs participating in the teleconferences. OSHA welcomes comment on all aspects of the PIRFA, but this document focuses on specific areas of interest to the agency. This document does not include discussions of wage rates or calculations of total cost. If costs are incurred to purchase a good or service, OSHA presents the estimated dollar cost of that purchase, but where costs are accounted for in additional time requirements from employees, those costs are presented only as the estimated time demands. The full calculations of costs, tables, and references can be found in the PIRFA.

2. Scope, Affected Entities, and Other Industry Characteristics

Scope

The scope of the rule OSHA is considering would address employers who have employees who work on telecommunications towers, regardless of the formal industry in which these employers are classified. The affected establishments will most commonly be subcontracted climbing companies. However, tower owners and turfing vendors could also fall within the scope of the

rule if they have employees directly involved in tower work. In rare cases, the requirements on multi-entity communication and on the maintenance of safety climbing systems installed on towers could affect establishments that do not employ workers who perform tasks on telecommunications towers.

Affected Entities

OSHA has preliminarily determined that entities affected by this potential rule would fall in one of three North American Industry Classification System (NAICS) industries: 237130 - Power and Communication Line and Related Structures Construction; 517919 - All Other Telecommunications; or 811213 - Communication Equipment Repair and Maintenance. The firms that would be affected by this potential rule make up only a small fraction of the total firms in the three NAICS industries. OSHA has preliminarily estimated that there are about 1,500 firms performing telecommunications tower work that would be covered by this potential rule.

Other Industry Characteristics

OSHA seeks comment from SERs on its preliminary determinations concerning additional variables that impact OSHA's calculations of the cost of the potential telecommunications tower rule.

Number of projects per year

OSHA preliminarily estimated, based on interviews with industry sources, that the average crew would undertake 30 projects per year. Since about half of telecommunications structures are not towers and are of structure types that are outside the scope of the potential rule, OSHA estimated that half of the work done by telecommunications towers workers is done on telecommunications structures covered by the potential rule's scope. Therefore, OSHA estimated that each crew would complete, on average, 15 projects per year that are covered by the potential standard.

Average days per project

OSHA preliminarily estimated that each project would take, on average, 8.33 days. OSHA has preliminarily estimated that the average crew will work 50 weeks per year.

Number of workers per crew

OSHA has preliminarily estimated that a standard crew is made up of four workers. This four-person crew is assumed to include one foreman, two climbers, and one other worker (who may be a rigger, engineer, heavy equipment operator, or other technician).

Number of workers affected by a potential rule

OSHA has preliminarily estimated that all workers at potentially-affected firms that meet the Small Business Administration’s definition of a small entity would be affected by this rule. In addition, based on the conversations with industry experts, the agency understands that there are few or no large firms in the affected industries that are devoted entirely to telecommunications tower work – most large firms in these industries undertake a variety of work of which only a small portion is covered by this potential rule. For example, many larger engineering firms that perform some telecommunications tower work also engage in other building and/or infrastructure construction projects. Based on this understanding, OSHA includes 40 percent of workers at affected large firms in the affected worker population. This means that OSHA estimates that there are about 24,000 affected workers performing telecommunications tower work. This is consistent with estimates from industry sources that estimate there are between 10,000 and 30,000 workers, who work on telecommunications towers.

Compliance with potential provisions

OSHA preliminarily estimated a compliance baseline for those entities that already follow the practices and requirements in each of the potential regulatory provisions. These estimated baseline compliance rates are between 80 and 95 percent. OSHA preliminarily estimated that 80 percent of affected entities are meeting the potential training requirements and that 84 percent of affected entities are compliant in their job hazard analysis (JHA), rigging plans, environmental hazard monitoring, toolbox talks, structural modification planning, and multi-entity communications. Ninety-five percent of affected entities are estimated to currently practice 100 percent fall protection.

a. Applicable alternative

1. Expand the scope to include non-dedicated telecommunications structures. (PIRFA Alternative 6)

In this alternative, the scope would potentially be phrased: “OSHA is considering a standard that would apply to all work activities performed on telecommunications structures, including but not limited to antennas and antenna-supporting structures, telecommunications towers, and antennas collocated on existing structures such as rooftops, water towers, and billboards.” Employees who perform work on antennas collocated on non-dedicated telecommunications structures like water towers experience many of the same hazards experienced by employees working on dedicated telecommunications structures. Expanding the scope of the potential standard to cover employees performing work on these types of structures would offer additional protection.

OSHA's preliminary analysis has identified, based on FCC data, 497,932 towers that are of the kind that would be covered by the potential standard. The FCC data show that there are over one million antenna-supporting structures in the United States so this scope alternative would significantly increase the number of affected employers.

Under this alternative, the number of projects per year covered by the potential rule would double to 30. However, this would likely not result in a simple doubling of the estimated total costs of the rule as outlined in the PIRFA. The cost of complying with similar provisions when working on non-tower structures would be less expensive and would require fewer resources relative to performing similar work on communications towers because about 60 percent of the work on non-towers structures would be on buildings, specifically building rooftops, which are easier to access and typically require no climbing. Further, some of the work performed on rooftops already requires compliance with other OSHA standards.

For example, structural modifications would be less complicated and therefore producing plans would be less expensive; the JHA would be simpler; fall protection would be cheaper as less time would be needed to climb onto a structure. Training would take less time and rigging plans would be less involved or unnecessary.

To estimate a total cost for this alternative, OSHA reduced the cost of fall protection, job hazard analysis, structural analysis, rigging plans, and training by one-half.

Total cost: An additional \$12.1 million per year in addition to the costs estimated for the rule as outlined in the PIRFA.

b. Questions for the SERs

1. Are there additional industries where workers are performing telecommunications tower work that OSHA has not included in this preliminary analysis? If so, which ones?
2. OSHA estimates that there are about 1,500 firms in this industry. How does this preliminary estimate compare with your knowledge of the industry? Are there more firms or fewer firms than OSHA has estimated? How many are there?
3. Should OSHA cover all telecommunications structures with this potential standard?
4. Do you agree with OSHA's estimate that the average crew would work on 15 projects per year that would fall under this potential rule? If not, how many projects per year would be covered? How many weeks per year do your crews work? How does seasonality impact tower work in your part of the country?

5. Does OSHA's estimate of four person crews being the standard crew size line up with your experience? If not, what is the makeup of a typical crew? What jobs do the workers on a typical crew have?
6. Do you agree with OSHA's preliminary estimate that all workers at small entities would be affected by this rule? Why or why not? Do you agree with OSHA's estimate that at large employers about 40 percent of workers would be engaged in work affected by this rule? If not, what percentage of workers do you expect would be affected? Why?
7. Do you agree with OSHA's preliminary estimate of baseline compliance rates? Why or why not? What are the sources of your estimates? Are there any provisions in the PIRFA that companies are rarely or never complying with? Which provisions? What are the challenges to compliance with the provisions you identified?
8. The telecommunications towers industry is mostly composed of very small firms. What makes your small firm competitive compared to large firms in your industry?

3. Regulatory Framework

Training

Consistent with the general requirements in ANSI A10.48, OSHA is considering a requirement that all employees working on a telecommunications tower worksite have certain minimum safety training that addresses topics, including fall arrest system training, environmental hazard recognition, and electrical hazard recognition. In addition to general training topics, OSHA is considering training requirements for specific roles and recordkeeping requirements for training.

OSHA is considering requiring that at worksites where an infirmary, clinic, hospital, or physician is not reasonably accessible in terms of distance and/or time, at least one member of each crew has current certifications in both first aid and cardiopulmonary resuscitation (CPR). This requirement generally aligns with current OSHA requirements (29 CFR 1926.50). OSHA has preliminarily determined that employers are complying with the existing OSHA requirements and already have at least one crewmember certified in first aid and CPR.

OSHA has preliminarily estimated the following costs of external training courses and the number of hours those courses take for different groups of employees. These costs shown here represent the cost to purchase training sessions and the numbers of hours the employee would spend training but do not include the monetary cost of the worker's time to attend. The PIRFA

(Table 10) includes the total training cost and accounts for the cost of the employee’s time to attend external training by using the loaded wage rates.

Course Cost and Hours of Commercial Training Course per Employee

Employment Category	Title	Course Cost	Hours
Climber	Authorized Climber	\$935	16
Climber	Competent Climber	\$1,630	24
Rigger	Competent Rigger	\$695	8
Rigging Supervisor	Crew Chief/ Supervisor/ Foreman	\$2,930	24
Supervisor/ Crew Chief	Crew Chief/ Supervisor/ Foreman	\$3,465	32
Sources: OSHA, Office of Regulatory Analysis, based on Comtrain, 2016b; Gravitec, 2016; NATE, 2016b; Safety Connection, 2016			

If an employer opts to train employees internally, that employer will incur the costs outlined in the table below. The cost to train the employee who will then train others includes the cost of an external “train the trainer” course and the cost of the loaded wages of the worker for the time spent attending that course. For each employee trained in-house by that trainer, the per-employee cost will include the cost of the trainer’s time (divided by the number of workers trained in each class) plus the wages for the time of the employee receiving training. The following table shows OSHA’s preliminary estimates of the amount of time necessary to provide training internally and the cost of a “train the trainer” course. The per-worker cost of training is equal to the hours of training times the worker’s loaded wage (inclusive of fringe benefits and overhead). These costs are presented in detail in the PIRFA.

Course Cost and Hours of Internal Training per Employee

Employment Category	Title	Course Cost	Hours
Trainer	Trainer	\$3,465	32
Climber	Authorized Climber	--	16
Climber	Competent Climber	--	24
Rigger	Competent Rigger	--	8
Rigging Supervisor	Crew Chief/ Supervisor/ Foreman	--	24
Supervisor/ Crew Chief	Crew Chief/ Supervisor/ Foreman	--	32
Sources: OSHA, Office of Regulatory Analysis, based on Comtrain, 2016b; Gravitec, 2016; NATE, 2016b; Safety Connection, 2016			

OSHA estimates that, regardless of whether training is provided internally or through a commercial training company, all workers will need to be retrained every two years.

a. Applicable alternatives

1. Require that training be provided by independent third-party providers. (PIRFA Alternative 11)

This alternative would require that training be provided by independent third party providers. Comments to the RFI indicated that in-house training might not be rigorous enough or sufficient to provide employees with the skills needed to safely climb.

Unit cost: This alternative would increase costs by 40 percent relative to the cost of training under the potential training provisions detailed in the PIRFA.

2. Adopt the Michigan Occupational Safety and Health Administration (MIOSHA) training requirement for hoist operators. (PIRFA Alternative 12)

Under this alternative, employers would be required to follow the MIOSHA standard that states: “The hoist operator shall have classroom training, a minimum of 40 hours experience as a hoist operator, not less than 8 hours experience in the operation of the specified hoist or one of the same type, and demonstrated the ability to safely operate the hoist.”

Unit cost: \$695 for a one-day class through the National Association of Tower Erectors (NATE) plus one day of wages for the operator attending the training. There could be some productivity benefits from having very experienced, well-trained operators running hoists on the job site.

3. Require hoist operators to have equipment-specific training and specialized training on safe hoisting of personnel. (PIRFA Alternative 13)

This alternative would require hoist operators to be trained in the safe operation of the specific hoist equipment that they are using and to be specifically trained or qualified to hoist personnel if they will be hoisting personnel. This training would be somewhat more robust than the training requirements of Alternative 12 requiring about 30 percent more hours of training. This training would consist of additional classroom and on-the-job training, and the employer would be responsible for ensuring that the hoist operator is adequately prepared to safely perform all hoisting activities. Moreover, this alternative would require at least four additional classroom training hours plus on-the-job training hours in addition to any training required by the potential rule or any of these alternatives.

Unit cost: \$695 for a one-day class through NATE plus one day of wages for the operator attending the training and one day of wages for on-the-job training.

4. Eliminate specific training requirements for hoist operators (PIRFA Alternative 4)

Under this alternative, there would be no specific training requirements for hoist operators. However, the employer would still be required to ensure that all workers are adequately trained and prepared to perform their assigned duties in a safe manner.

Unit cost: savings of between \$475 and \$951 per worker in avoided training costs relative to the training provisions outlined in the potential rule in the PIRFA.

b. Questions for the SERs

1. Do you currently provide training to your workers? If so, please describe your training program.
2. Are new hires trained in all cases or do you rely on workers having a climbing card to determine if those new hires will need training? How frequently do you retrain workers?
3. Do you use commercial training programs or do you perform employee training in-house? Why did you make this choice?
4. Do you find that commercial training programs adequately prepare employees? Why or why not?
5. What steps beyond verifying attendance in a training program do you take to ensure that new employees are adequately prepared to perform their jobs safely?
6. Are OSHA's cost estimates for this subject consistent with your industry's experience? If not, why not?
7. Are any members of your work crews certified in first aid and CPR? If so, how many crewmembers are certified?

Worksite Conditions

OSHA is considering requirements that address worksite conditions, which may include a job hazard analysis (JHA), toolbox talks to discuss safety issues, and rigging plans. These general

requirements are recommended or required by current recognized consensus standards, including ANSI A10.48, TIA 322, and TIA 222-G.

Job hazard analysis (JHA)

OSHA is considering requiring employers to prepare a written JHA prior to each job or project to identify hazards present at the worksite related to the specific nature of the job tasks, the nature of the worksite, and the specific conditions present at the worksite, as well as the specific means of abatement or avoidance of each of the hazards.

OSHA preliminarily estimates that the JHA will be completed by a crew chief or supervisor and will take 30 minutes on average to complete on the first day of a new project and 20 minutes on each subsequent day.

Toolbox talks

OSHA is considering a requirement that employers hold a meeting with employees before each shift. This meeting will provide an opportunity for crews to discuss relevant safety topics, including unique hazards presented by the scheduled work activities and methods for avoiding those hazards.

OSHA preliminarily estimates that the toolbox talk will take 30 minutes on the first day of a project and 15 minutes on subsequent days and will involve all crewmembers at the site.

Rigging, hoisting, and gin pole use

OSHA is considering requirements for a detailed rigging plan for hoisting materials or employees. The agency is also considering requirements for the use of gin poles. Both sets of requirements would be consistent with the requirements of TIA 322 and ANSI 10.48.

OSHA preliminarily estimates that rigging plans will take four hours to complete for most tower projects and that this will entail two hours of work from a rigger to draft the plans and two hours from an engineer to review the plans.

a. Applicable alternatives

1. Replace the JHA with a hazard checklist and the toolbox talk with confirmation of a review of the checklist by workers. (PIRFA Alternative 2)

Under this alternative, requirements for a brief hazard checklist and verbal confirmation from workers confirming that they reviewed the checklist would replace requirements for a detailed JHA and toolbox talk. This alternative would entail lower costs and might eliminate any written material from the JHA process.

Unit cost: 70 percent reduction per project in the cost relative to the cost of a JHA and toolbox talk under the potential requirements in the PIRFA.

2. Eliminate the requirement for a written JHA. (PIRFA Alternative 3)

This alternative would require only that a competent climber complete a visual evaluation of the hazards present at the worksite; there would be no requirement for a written JHA for each site.

Unit cost: Would reduce costs by \$324 per job relative to the cost of the potential regulatory provisions in the PIRFA.

b. Questions for the SERs

1. Do you currently prepare a job hazard analysis? If so, what elements do you include in your JHA? How much time is spent preparing the JHA?
2. Are daily toolbox talks a common occurrence in the telecommunications tower industry? At your company, do you currently engage in toolbox talks or any similar meeting or briefing? If so, do these meetings take place daily? If not daily, how often do these meetings take place? What topics are addressed in these talks? How much time is spent on toolbox talks or daily meetings?
3. Are rigging plans standard practice in your industry? Does your company currently develop rigging plans? How long do these plans take to complete? Who develops them?
4. Are OSHA's cost estimates for this subject consistent with your industry's experience? If not, why not?

Environmental Hazards

This section will address environmental hazards specifically, including weather and wildlife-related hazards.

Weather hazards

Employers would be required to check weather reports before commencing work and to monitor weather conditions periodically as work activities take place. Employers would also be required to ensure that their employees are not climbing towers in hazardous weather. In most circumstances, this would entail a worker checking one or two weather applications on a smart

phone or setting smart phone applications to provide automated weather notifications, but the weather may be monitored periodically from a central office and communicated to workers in the field.

OSHA estimates that smart phone checks of weather conditions will take 2 minutes per day.

Wildlife

On sites where wildlife hazards (such as venomous snakes, stinging insects, birds, etc.) are present, employers would be required to discuss them with employees prior to beginning work and in the JHA. Employers would be required to provide effective protection against wildlife hazards if there is no higher method of control available, such as eliminating the hazard.

OSHA has preliminarily determined that the costs of identifying and alerting workers of wildlife hazards is included in the costs of the JHA and toolbox talk.

Worksite locations

For remote or inaccessible worksite locations and sites where emergency rescue is not available, the employer would be required to plan for the rescue of climbers and to respond to other emergency situations.

a. Applicable alternatives

1. Require monitoring of weather conditions on an hourly basis. (PIRFA Alternative 16)

Under this alternative, employers would be required to check for any potentially hazardous weather situations before work begins, either by checking weather reports via mobile device or by contacting a centralized office that can monitor weather systems. This alternative would require weather conditions to be monitored or checked on an hourly basis when climbers are on the tower. It would also require the employer to create and retain documentation that the weather was checked each hour while employees are on the tower.

Unit cost: 10 weather checks per day, 5 minutes per check, performed by a supervisor plus 1.5 minutes per check to document.

2. Require elimination of wildlife hazards to the fullest extent possible. (PIRFA Alternative 17)

Under this alternative, wildlife hazards must be eliminated to the fullest extent possible, while considering environmental protection issues, before technical work can

commence. This alternative would remove whatever hazards wildlife poses to climbers. Eliminating wildlife hazards would take a team of two climbers one hour. However, the presence of threatened or endangered species can delay a project for a considerable amount of time.

Unit cost: Two hours of a climber's wage rate plus the cost of equipment to eliminate wildlife from the structure. OSHA estimates that wildlife hazards will need to be dealt with on 2 percent of projects.

b. Questions for the SERs

1. What methods does your company typically use to monitor weather hazards? How long does this monitoring typically take? How frequently are weather conditions monitored? Are weather conditions documented in any way? How?
2. How frequently do you encounter hazardous wildlife? How are those hazards addressed? Have you experienced a situation where threatened or endangered species were located on or near a job site? What did you do? Are there additional costs associated with wildlife hazards that OSHA has not considered? What are the additional costs?

Safe Work Practices

General

OSHA is considering general requirements addressing safe work practice considerations for all telecommunications tower worksites, including:

- Requiring the employer to include breaks in the JHA to avoid hazards presented by fatigue, and to discuss them in toolbox talks. (This is a standard work practice that is supported by OSHA's General Duty Clause 5(a)(1). OSHA discusses the importance of work/rest schedules as one method of addressing overexertion in hot weather in its Heat Illness Prevention Campaign.
- Requiring the employer to provide adequate access to restroom facilities as required by current OSHA standards (29 CFR 1926.51(c)).
- Requiring the employer to complete a rescue plan that includes the location of, directions to, and direct contact information for the nearest hospital, to identify employees who hold current first aid and CPR certification, and to provide proper rescue equipment, where applicable.
- Requiring the employer to provide personal protective equipment (PPE) to protect against environmental hazards (29 CFR 1926.28, 29 CFR 1926.95).

- Requiring employers to address falling object hazards for workers on the ground or at lower elevations on the tower (29 CFR 1910.28(c)).

OSHA has not taken costs in the PIRFA for any of these potential provisions because they were determined to already be standard work practices or required under existing OSHA rules.

Structural work on telecommunications towers

OSHA is considering a requirement that structural work (new construction, modification, and demolition) that could potentially compromise the stability of the tower be supervised and/or planned by a qualified engineer who has experience working with telecommunications towers, and that the structural work complies with relevant consensus standards, including ANSI A10.48, TIA 222-G, and TIA 322.

For structural modifications that have the potential to compromise the stability of the structure, the standard would require that the work be planned and/or supervised by a qualified engineer. Structural modifications of a low degree of complexity would require a structural analysis by a qualified engineer, and the work itself would have to be supervised by a competent person. Structural modifications of a medium degree of complexity would require a structural analysis and the development of step-by-step instructions by a qualified engineer, and the structural work would be supervised by a competent person. OSHA estimates that developing step-by-step instructions would take four, five, or six hours for small, medium, and large towers, respectively. Step-by-step instructions would only be needed for medium complexity structural modifications because low complexity projects are simple enough that they do not need this type of detailed instruction and high complexity projects will have experts present on site directing the work. Structural modifications of a high degree of complexity would require a structural analysis conducted by a qualified engineer, and the work would need to be planned and supervised by a qualified engineer.

OSHA estimates that it will take a qualified engineer two hours to develop plans for the structural modification of a small tower, eight hours for a medium tower, and 32 hours for a large tower. OSHA estimates that supervision of structural modifications will take eight hours for small towers, 40 hours for medium towers, and 80 hours for large towers and that these times will not vary based on the complexity of the tower although the type of worker responsible for supervising will vary.

a. Applicable alternatives

1. Require mandatory rest breaks for climbers. (PIRFA Alternative 18)

This alternative would require mandatory rest breaks throughout the day.

Unit cost: one hour of total rest breaks per climber per shift.

2. Require mandatory rest breaks and the availability of climate-controlled vehicles for these breaks. (PIRFA Alternative 19)

This alternative would require employers to provide employees prescribed rest breaks and access to on site climate-controlled vehicles where employees could take their breaks.

Unit cost: one hour of total rest breaks per climber per shift. No cost taken for a climate-controlled vehicle because OSHA expects most work vehicles on site will have working climate control.

3. Require training in recognizing and avoiding exhaustion related hazards. (PIRFA Alternative 20)

This alternative would require employees to be trained in the recognition and avoidance of hazards related to exhaustion. Employees must be authorized to take rest breaks as needed to avoid exhaustion.

Unit cost: Two hours of training per climber plus the cost of training materials.

4. Require first aid and CPR certification for each crewmember. (PIRFA Alternative 14)

Under this alternative, current certification in both first aid and CPR would be required for each member of the crew. These skills are important because crews often perform their own rescues.

Unit cost: Three to four hours of worker's time for first aid training plus an additional three to four hours of worker's time for CPR training.

5. Require dedicated, on site rescue personnel. (PIRFA Alternative 15)

Under this alternative, a dedicated rescue team must be stationed on site. One to two on site rescuers would be required for this alternative.

Unit cost: Cost of having 2 rescuers on site 8 hours per day.

6. Require planning by a certified, practicing engineer (CPE) when work could compromise structural integrity. (PIRFA Alternative 21)

Under this alternative, work that could compromise structural integrity must be planned by a CPE. This plan would include a structural analysis as well as a plan for the work to be completed.

Unit costs: 8 hours of a CPE's time per project on an estimated 25 percent of all telecommunications towers projects each year.

7. Require a CPE to provide structural analysis and detailed instructions for structural work. (PIRFA Alternative 22)

Under this alternative, for any structural modifications, a CPE shall provide a structural analysis and detailed step-by-step instructions for work to be done. Work shall be supervised by a qualified person.

Unit cost: \$428 for most projects.

b. Questions for the SERs

1. Do you agree that the general safe work practice requirements would result in no additional costs to businesses? If not, which add to or change existing requirements? How would your work practices change in order to comply with these requirements? What would these work practice changes cost?
2. Do these potential requirements adequately protect workers? Why or why not? Are there additional safe work practice requirements that OSHA should include? Please describe them.
3. Should OSHA include costs for complying with these potential requirements? Why or why not?
4. What are the procedures you currently use for planning and executing structural modifications? What sort of expertise do those involved in these processes possess (e.g., training, certifications, experience)? How long do your current processes take?
5. Do the requirements for structural modification presented here protect workers from structural collapses? Are there additional requirements OSHA should include? Are any of the included requirements unnecessary?

6. Are OSHA's cost estimates for this subject consistent with your experience? If not, why not?

Multi-Entity Considerations

Communication requirements

OSHA is considering a requirement for communication that all contract firms on the jobsite communicate with one another about hazardous conditions, safe work procedures, and tower installation and modification specifications. This would occur prior to beginning work, by phone or in person, and additional communication would be required if work conditions change substantially.

OSHA estimates that communication of hazards would require 10 minutes of a worker's time for small companies and 15 minutes of a worker's time for large companies. OSHA estimated that turfing vendors communicate with the tower owner and at least one direct subcontractor, with an assumed upper bound of six total communications for larger projects, and that subcontracting companies are involved in one or two communications per project.

Considerations for structural alterations and/or modifications

OSHA is considering requirements for structural alterations and modifications that vary by the complexity of the work involved as discussed in the previous section. Under the multi-entity considerations, OSHA specifies that the controlling employer would be required to ensure that prior to beginning work, the required analysis, instructions, or work plan is developed and that the work is supervised or directed by a workers with the appropriate expertise.

a. Applicable alternatives

1. Require daily communication among multiple contractors on site. (PIRFA Alternative 23)

The potential requirements for communication discussed earlier would require communication among contracting layers about hazardous conditions, safe work procedures, and structure installation and modification specifications before the project starts and when conditions change substantially. Under this alternative, communication would be required both at the beginning of the work and throughout the day.

OSHA believes that this would be accomplished with a daily 10- to 20-minute conference call between the contracting layers.

Unit cost: 15 minutes of supervisor time, for each of four subcontractors on site.

2. No requirements for multi-entity communications. (PIRFA Alternative 5)

This alternative would be less strict than either the communications requirements in the regulatory framework, or the requirements in consensus standards. Under this alternative, no multi-entity communications will be required.

Unit cost: Savings of \$100 per project (based on the mid-point of per-project communications cost).

b. Questions for the SERs

1. How does communication among tower owners and contractors work currently? How frequently does your company communicate about worksite hazards or conditions with other firms that are present on the site? How long do these conversations last?
2. Are OSHA's cost estimates for this subject consistent with your experience? If not, why not?

Fall Protection

Duty to have 100 percent fall protection

OSHA is considering a requirement that employers protect workers from fall hazards at all times when climbing and when working at a position above 6 feet. This is a requirement for 100 percent fall protection. Employees may be required to be protected from falling 6 feet or more by a personal fall arrest system, guardrail system, and/or a safety net, but OSHA believes that often guardrails and safety nets are difficult to use effectively on telecommunications towers. Most telecommunications tower companies equip their climbers with personal fall arrest systems as the preferred method of fall protection. Simply providing PPE in the form of personal fall arrest systems to workers does not meet the requirements to ensure 100 percent fall protection. In order to meet this requirement, employers must also ensure that workers are always tying off the provided PPE to appropriate anchors.

Personal fall arrest systems

All personal fall arrest systems would conform to existing OSHA requirements and employers would be required to provide a boatswain seat-type full body harness to employees climbing telecommunications towers to prevent hazards associated with suspension trauma.

For the purposes of costing this potential rule, OSHA is assuming that all climbers are being provided the correct PPE but are not tying off their PPE correctly. Climbing companies will incur costs for the additional time that workers will spend securing their PPE when they otherwise would have failed to do so.

Maintaining 100 percent tie-off by climbers does require additional time during a climb. As an example, climbing a 30-foot monopole with anchorage points and a y-lanyard might require 10 minutes with 100 percent tie-off, and 3 to 5 minutes without 100 percent tie off. For the purposes of the PIRFA, OSHA has preliminarily estimated that 100 percent tie off will increase by 50 percent the time necessary to climb a tower so the unit costs for this potential provision are the additional labor costs per project day for slower and safer climbs.

Safety climb systems

OSHA is considering requirements that address the installation, maintenance, and inspection of safety climb systems where they are already installed on towers, including requiring employers to report broken or non-functional safety climb systems to telecommunications tower owners and to prevent employees from relying on inoperable safety climb systems for fall protection.

a. Applicable alternatives

1. Require a safety climb system for all climbs. (PIRFA Alternative 7)

Under this alternative, OSHA would require the employer to only allow its employees to climb a tower if it has a safety climb system. For most (if not all) systems, this would involve installing the safety climb device to the tower itself, as well as purchasing and ensuring the use of a cable grab device for each climber to connect the climber's harnesses to the safety climb system. Employers could remove the safety climb system after the work is concluded (this would reduce the cost as the system could be reused).

Unit cost: \$1,015 per tower.

2. Require safety climb system inspections. (PIRFA Alternative 8)

Under this alternative, where safety climb systems are installed on structures, the contractors working on the tower would have a duty to ensure the safe functioning of that safety climb system. OSHA estimates it will take one hour per inspection by a crew of two climbers, and that 25 percent of projects will have a safety climb system.

Unit cost: 2 hours of climber's wages.

3. Require engineered anchorages be retrofitted on all structures. (PIRFA Alternative 9)

Under this alternative, engineered anchorages would be required on every structure and each climber would be required to use the anchorages. In order to be used as fall protection, these anchorages must be capable of withstanding at least 5,000 pounds of force (22.2 kN) per employee attached, and must be clearly marked or identified as anchors for personal fall arrest systems.

Unit Cost: \$43 to \$1,000 per anchor not including labor time for installation. OSHA estimates that towers average 70 feet in height, and therefore this alternative would require about 18 anchorages per tower. OSHA also estimates that there would be about 7,125 projects annually that would require retrofitting.

4. Require that lifts or cranes be used as much as practicable to minimize climbing. (PIRFA Alternative 10)

This alternative would require for all climbs, the use of a lift or crane to minimize the amount of climbing that employees must do. For this alternative, an aerial lift or crane would lift the employee to the work station or close to the work station, and then the employee, using 100 percent fall protection would either complete the work from the basket of the crane or lift when possible, or would exit the basket close to the workstation. This would diminish the fatigue and other hazards associated with long climbs on towers.

Unit cost: \$210 per hour for the lift or crane equipment plus the cost of the crane operator's time. However, there would likely be worker productivity improvements associated with this alternative as workers would be transported onto the structure faster, and they would have less fatigue (source: OSHA).

b. Questions for the SERs

1. How much additional time does maintaining 100 percent tie-off take?
2. Do you use any methods other than personal fall arrest systems to protect workers from falling? Please describe them.
3. Do the requirements in the PIRFA protect workers from falling? If not, why not? Are there requirements for fall protection OSHA should include instead or in addition to what is in the PIRFA? What are they?

4. Are OSHA's cost estimates for this subject consistent with your experience? If not, why not?

Support Equipment Requirements

Hoisting

OSHA is considering including requirements for equipment used while hoisting both materials and personnel, based on provisions in ANSI A10.48 and TIA 322. Requirements addressed would include:

- Design, mounting and anchorage, inspection, and operation of base-mounted drum hoists and capstan hoists.
- Materials hoisting procedures, controlled access zones, load lines and tag lines, and load testing and verification.
- Personnel hoisting including requiring the use of a base-mounted drum hoist when hoisting personnel, specifications for any hoist used to hoist personnel, and a prohibition on the use of capstan hoists to hoist personnel.
- Rigging of loads, including rigging components, safety factors, and inspections; and
- Using gin poles to hoist materials, including gin pole components, connections, load charts, and the labelling and identification of gin poles.

Use of cranes in telecommunications tower work activities

OSHA is considering including requirements for equipment used while hoisting both materials and personnel, based on provisions in ANSI A10.48 and TIA 322.

OSHA has preliminarily determined that these requirements are standard industry practices and/or covered by existing OSHA rules (29 CFR 1926 Subpart CC) and therefore would not impose new costs on employers.

a. Applicable Alternatives

OSHA has not identified any alternatives to the potential requirements in this section but welcomes comment from the SERs on possible alternatives.

b. Questions for the SERs

1. How do these potential requirements for support equipment compare with your current practices? Would your work practices change as a result of these requirements? If so, how?

2. Do you agree that the requirements for equipment used while hoisting both materials and personnel, based on provisions in ANSI A10.48 and TIA 322 would result in no additional costs to businesses? If not, which add to or change existing requirements? How would your work practices change in order to comply with these requirements? What would these work practice changes cost?

Structural Requirements for Telecommunications Towers

Structural loading considerations

OSHA is considering the inclusion of structural loading considerations consistent with TIA 222-G and TIA-322.

Tower inspection requirements

OSHA is considering several requirements for the inspection of telecommunications towers. In particular, employers would be required to inspect and assess the condition of safety climb systems, tie-off points, and ladders on a pre-job or pre-shift basis.

In addition, tower owners would be required to conduct regular structural inspections every three to five years, including inspecting for loose, missing, or damaged bolts and structural members, assessing the conditions of tower foundations and surrounding grounds and guy wires, and assessing the condition of coaxial cables for fire hazards and guy wires for tensioning and connectors.

OSHA has preliminarily estimated that it will take 6 hours to inspect a small guyed tower, 8 hours to inspect a large guyed tower, 4 hours to inspect small towers of all other types and 6 hours to inspect large towers of all other types.

a. Applicable Alternatives

OSHA has not identified any alternatives to the potential requirements in this section but welcomes comment from the SERs on possible alternatives.

b. Questions for the SERs

1. Are tower inspections currently being conducted? If so, who currently performs the tower inspection? How frequently are towers inspected?
2. Are tower inspections necessary to protect workers? Why or why not? Should OSHA include any additional requirements or change the potential requirements to better

protect workers? What additional requirements would be beneficial? What changes would better protect workers?

3. Are OSHA's cost estimates for this subject consistent with your experience? If not, why not?

4. National Consensus Standards as an Overall Alternative

There are several consensus standards that address hazards in the erection, construction, and maintenance of telecommunications towers. The ANSI A10.48, TIA-222-G, and TIA-322 standards contain valuable information, and OSHA, in accordance with the OSH Act, will carefully consider the content of all relevant national consensus standards in any potential rulemaking. Accordingly, OSHA has preliminarily analyzed adopting by reference the ANSI A10.48 standard as a regulatory alternative (PIRFA Alternative 1).

OSHA has produced a preliminary cost estimate for adoption of the ANSI standard, using many of the same unit costs included in the PIRFA. The agency evaluated only the costs of those provisions paralleling the provisions that OSHA is considering and did not cost provisions where OSHA is not considering similar provisions such as the ANSI Multi-Employer requirements and a number of other requirements including helicopters, hoists, demolition, and electromagnetic energy which might duplicate or conflict with OSHA or other federal safety regulations. The ANSI standard appears to have more expensive training requirements, but OSHA was not able to quantify the higher training costs for these requirements.

For the portions of the ANSI standard that OSHA costed, the total estimated annual cost of the ANSI standard is less than the total annual cost of the potential standard outlined above and in the PIRFA. If the additional consensus standard requirements were considered and costed, the ANSI standard might be more expensive to implement than OSHA's preliminary standard as outlined in the PIRFA.

The total estimated cost of this alternative would be about \$19.2 million per year – about \$3.4 million less than the \$22.6 million OSHA estimated as the total cost of the rule as detailed in the PIRFA.

Below is a brief analysis comparing OSHA's potential standard to the ANSI standard. A side-by-side analysis comparing the potential rule outlined in the PIRFA to the ANSI standard is available in Appendix C of the PIRFA.

Aspects where OSHA's potential rule as described in this PIRFA is more stringent than the ANSI standard:

Safe Work Practices

Under Structural work on telecommunications towers, OSHA's categories of structural modifications are in general alignment with ANSI A10.48, section 4.8. There are two areas that OSHA has exceeded the recommendations in the ANSI standard.

Involvement of a qualified engineer

The ANSI standard requires that for class III and IV construction, "a qualified person shall coordinate the involvement of a qualified engineer as required when establishing rigging plans. A qualified engineer shall perform the analysis of structures and/or components for Class IV construction." (Section 4.8). OSHA's potential rule requires that structural modifications of a high degree of complexity "would require a structural analysis conducted by a qualified engineer, and the work would need to be planned and supervised by a qualified engineer." The reason for this more robust involvement of a qualified engineer is based on multiple structural collapses where the ongoing engagement of a qualified engineer might have avoided many of the conditions that led to these collapses.

Step-by-step instructions

For structural modifications of a medium degree of complexity, in addition to performing the structural analysis prior to beginning work, OSHA's potential rule requires that the qualified engineer also "prepare detailed, step-by-step instructions for the work to be done." This has been included due to structural collapses where having more detailed information might have prevented the conditions that led to the structural collapse, such as removing structural members in the incorrect order.

Environmental Hazards

In the ANSI A10.48 standard, the environmental hazard sections (sections 5.10.9, Vegetation/Plant/Animal Hazards, 5.10.10, Toxins, and 5.10.11, Biohazards) are primarily definition-based, and do not provide a great deal of detail on the employer's responsibility to recognize and abate these hazards. OSHA's potential rule requires wildlife hazards to be included in the JHA where present. If a hazard cannot be eliminated, the employer is required to provide appropriate PPE if necessary.

Toolbox Talks

OSHA is considering a requirement that employers hold a meeting before each shift to review the JHA and to discuss specific issues that will be factors in the day's work. The ANSI A10.48 standard does not have a specific requirement for a toolbox talk.

Aspects where ANSI A10.48 recommendations conflict or overlap with existing OSHA policy or standards or other existing laws.

Multi-Employer issues

The ANSI standard states in section 4.6, that “the owner or general contractor have overall responsibility for the worksite or designate responsibility to a lower tier contractor in writing.” This does not conform to OSHA’s multi-employer policy (CPL 2-0.124). An entity cannot delegate their responsibility under the OSH Act for worksite safety and health to another party.

Radio frequency/Electromagnetic Energy

Section 7 of the ANSI standard addresses radio frequency. Currently, the FCC regulates occupational exposure to radio frequency (RF); therefore OSHA cannot regulate RF exposure in accordance with §4(b)(1) of the OSH Act.

Hoist Operators

In section 8.12, Operator Requirements and Responsibilities, the ANSI standard requires that hoist operators have “no evidence of having physical or emotional instability that could render a hazard to the operator or others.” OSHA does not require that employers evaluate the emotional stability of their employees, and this might risk violating existing employment law. If OSHA incorporates the ANSI standard, this section would need to be excluded from the incorporated rule.

Demolition

Section 16 of the ANSI standard covers demolition. OSHA has standards that cover the demolition of structures (29 CFR 1926 Subpart T, Demolition), so OSHA would likely not incorporate this section to avoid overlapping and/or conflicting standards.

Helicopters

Section 17 of the ANSI standard covers helicopters used for lifting loads. OSHA has standards that govern the use of helicopters for hoisting materials (29 CFR §1926.551), so OSHA would likely not incorporate this to avoid overlapping and/or conflicting standards.

Aspects where the ANSI standard is more stringent than OSHA’s Framework:

Training

The ANSI standard contains recommendations on training that in some aspects exceed OSHA’s potential rule, in particular where they address recordkeeping requirements. For example, section 14.9 states, “The employer shall keep the following documented records: a) The course outline or description; b) The sources used to develop the training; c) The names of individuals that designed and put the course together; d) The delivery materials used or course content; e) The trainees participating in the class; and f) The trainees

successfully passing the class.” It is unlikely OSHA would require the employer to maintain every single one of these records.

Other training provisions would generate high levels of paperwork, and could end up being burdensome for employers. For example, section 14.10 states: “Training Module Evaluation. The owner or training provider shall evaluate their training programs annually to ensure the program provides the employee(s) with up-to-date training referencing the latest industry standards, federal, state and local requirements as they apply to the employer’s work product. This evaluation may also take into account the analytical data on injuries, accidents, near misses compiled by the employer and adjustments shall be made to reduce these types of issues.” There are very few OSHA standards that require this level of detailed annual review of training programs.

a. Questions for the SERs

1. Should OSHA adopt by reference the ANSI A10.48 standard? Why or why not?
2. Does your company follow part or all of the ANSI A10.48 standard? Which provisions?
3. Are there provisions in the ANSI standard that OSHA has not included in the PIRFA that you believe are necessary in order to fully protect workers? Which ones?
4. As a small entity, do you see any difficulties in complying with the ANSI standard as written? Which provisions? What are the difficulties in complying? Are there any sections of the ANSI standard that you would not be able to comply with? Which ones? Why would you be unable to comply?
5. As a small entity, are there any sections of the ANSI standard that you find particularly effective? Which ones? Why are they effective?