OSHA® Occupational Safety and Health Administration

FCC Federal Communications Commission

Communication Tower Best Practices

OSHA 3877-06 2017

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Communication Tower Best Practices

U.S. Department of Labor
Occupational Safety and Health Administration
and
The Federal Communications Commission

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U.S. Department of Labor

Federal Communications Commission

Best practices in Communication Tower Safety, gathered from industry stakeholders and participants in the DOL/FCC Joint Workshops on Tower Climber Safety on October 14, 2014 and February 11, 2016.

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Introduction and Background

The Occupational Safety and Health Administration and the Federal Communications Commission are concerned about the risks faced by employees in the communication tower industry. Employees climb communication towers to perform construction and maintenance activities and face numerous hazards, including fall hazards, hazards associated with structural collapses and improper rigging and hoisting practices, and "struck-by" hazards.

The business structure of the communication tower industry presents additional challenges to ensuring employee safety. When carriers own their own towers and directly employ the employees who build and maintain the towers and the equipment on them, the carriers have the ability and incentive to ensure safe practices. Typically, however, the relationship between carriers and tower employees is more complicated. For example:

- Towers are often owned by separate corporations (not carriers, generally), and are built by contractors;
- Carriers often contract with "turfing vendors" for the installation and maintenance of equipment on towers;
- Turfing vendors, in turn, may hire other contractors to perform work; and
- These contractors may sub-contract tower work to still smaller employers.

As a result, carriers and tower owners may not know who is performing work for them, or when work is being performed. Thus, responsibility for employee safety is fractured into many layers. Instead of a single company having control and responsibility for employee safety and tower

integrity, employer responsibilities can be spread over numerous small employers. Additionally, the amount of communication tower work being performed waxes and wanes with waves of new technology. The work is physically demanding and requires employees to spend long periods of time away from home; hence, job tenure tends to be short and turnover tends to be high. In light of these circumstances, ensuring employee safety requires accountability and diligence throughout the contracting process, all the way from the carrier to the individual employee performing the work.

Recognizing the risks that tower employees face, OSHA and the FCC held a workshop on communication tower employee safety on October 14, 2014. During this workshop, industry stakeholders, along with employee safety advocates and the families of communication tower employees who had been killed on the job, gathered to discuss issues affecting the safety of communication tower employees. A follow-up workshop was held on February 11, 2016, during which a panel of industry stakeholders and advocates discussed best practices that could reduce injuries and fatalities among tower employees.

This document is a collection of the best practices gathered from those workshops and from the discussions that continued beyond those events. These best practices are focused on the ways in which each level in the contracting chain can build a positive culture of safety and accountability. This cultural change is a critical first step in creating a safer environment for all employees in the industry. Some industry stakeholders have already begun to take major steps towards instituting this shift in policies, practices, and attitudes, and OSHA and the FCC are committed to supporting these efforts.

General Topics

Safety and health programs

All entities should establish a comprehensive safety and health program. This program should address all of the hazards associated with communication tower work, and all companies should ensure that their safety and health programs are compatible with the safety requirements imposed by other companies in the contract chain.

The core elements of a comprehensive safety and health program include[1]:

- **Management leadership:** Managers at all levels continually demonstrate their commitment to improved safety and health. Accountability and diligence is maintained at every level of the organization.
- **Employee participation:** Employees are involved in all aspects of the program and understand their roles and responsibilities under the program and what they need to do to carry them out effectively.
- **Hazard identification and assessment:** Procedures are put in place to continually identify workplace hazards and evaluate risks, both job-specific and systemic.
- **Hazard prevention and control:** A plan is developed to ensure that hazard controls are implemented, to track progress, and to verify the effectiveness of controls once they are implemented.
- **Education and training:** All supervisors and employees are trained to understand how the program works and how to carry out the responsibilities assigned to them under the program.

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1. For more information on safety and health programs, see OSHA's Recommended Practices for Safety and Health Programs at www.osha.gov/shpguidelines.

- **Program evaluation and improvement:** Processes are established to monitor program performance, to verify program implementation, to identify program deficiencies and opportunities for improvement, and to take actions necessary to improve the program and overall safety and health performance.
- **Communication on multiemployer workplaces:** Host and contract employers coordinate on work planning and scheduling to identify and resolve any conflicts that could impact safety or health.

Safety and health programs and contracting practices

- To maximize effectiveness, coordination of safety and health programs along the contracting chain should be managed by a designated person (for example, a Chief Safety Officer) to ensure clear lines of responsibility and accountability.
- This designated person will ideally have some personal experience climbing and working on towers or have a close advisor who has such experience.
- The program should clearly delineate the roles and responsibilities of each party in the contracting chain in regards to employee safety and health.
- Abiding by these roles and responsibilities should be a condition of awarding contracts.
- The safety and health program should establish concrete consequences for contractors that do not take appropriate steps to ensure the safety of their employees. In some instances, termination of the contract may be an appropriate consequence.

- All lower-tiered contractors should be required to have written safety and health programs of their own.
- It is strongly recommended that contractor safety and health programs be reviewed on at least an annual basis to ensure that they are functioning as designed and to identify areas for improvement.

Verification of subcontractors

Every entity in the contract chain should require lower-level contractors to have comprehensive safety and health programs in place that identify a Chief Safety Officer, and written verification procedures that can be adopted to ensure that contractors are implementing such programs. The verification process should include:

- Clear criteria for vetting and approving all contractors (including subcontractors), and verification that all contractors are subject to the same vetting criteria;
- Procedures for obtaining (or requiring contractors to maintain) certification and training records for each climber on site;
- Procedures for obtaining written approval for any subcontracting;
- Procedures providing for the ongoing monitoring and evaluation of contractor safety records (including OSHA records);
- Criteria for considering a contractor's safety record in the awarding of future contracts; and
- Provisions for independent (third-party) audits of job sites to ensure that the contractors performing work are vetted contractors and that they are performing work using appropriate safety measures.

- Stop work authority: Safety and health programs should authorize and instruct all employees, at all levels in the contracting chain, to stop work on a project if unsafe conditions are discovered and provide assurance to those employees that there will be no repercussions or reprisals for doing so.

Tower Climbers and Ground Crew Employees

- Tower climbers and ground crew employees should know how to report unsafe conditions and should follow the applicable reporting process whenever they discover unsafe conditions.

Photo: ACTA Safety

- All work crews need to have and use proper safety equipment at all times. No work should be done if proper safety equipment is unavailable or the safety equipment available is not functioning properly.
- All employees should certify their commitment to "100 percent tie-off" at least once each year. Job site supervisors need to have a firm commitment to enforcing 100 percent tie-off at every worksite at all times when employees are climbing.
- All climbing work should include comprehensive safety planning, including a Job Hazard Analysis (JHA) and an Emergency Action Plan (EAP) for every job site.
- Work crews should not work at heights when weather conditions raise safety risks.

- No member of a work crew should work at heights if their physical or mental health is impaired. For example, if a member of a work crew is taking medication that affects his or her physical abilities (such as over-the-counter cold and flu medication that can cause drowsiness), he or she should not climb or work at elevations.
- Work crews should promptly report issues with any safety device and cease operations if the safety device is compromised.
- Work crews should continually seek to enhance their safety skills and awareness through regular trainings and stand-downs.
- Particular attention should be paid to inspections, including equipment inspections (such as inspections of tools, hoisting and rigging equipment, and other machinery) and inspections of personal protective equipment.
- Contractors need to ensure that there is a competent person on site at all times. This person should monitor the mental and physical well-being of climbers on his or her team. The competent person should have authority to stop an unfit employee from climbing and should be expected to exercise that authority whenever necessary to ensure the safety of employees at the site.

Carriers and Tower Owners

Carrier and tower owner general topics

Contractor selection and vetting

Carriers and tower owners should have clear criteria for selecting and vetting all contractors. For additional information on contractor vetting, please see the "Verification of subcontractors" section in General Topics.

Reporting

- Carriers and tower owners should establish an incident reporting system with a clearly defined, streamlined process for responding to incidents in a timely manner.
- Carriers and tower owners should create a standard protocol to ensure that all employees (including employees of contractors) report unsafe conditions on tower worksites to the carrier and tower owner.
  - Carriers and tower owners can foster a culture where everyone is encouraged to report safety issues by making it easy to anonymously report unsafe towers to a telephone hotline, or via a mobile phone application.
  - A crucial part of building this culture includes removing any fears of retaliation or negative consequences for reporting.
- All reports of unsafe conditions should be managed from a central location where a repair/maintenance request would be generated, prioritized and tracked until the condition is corrected.
- Carriers and tower owners should stop work immediately whenever any serious safety issue is reported on a work project.
  - Work should not be restarted until the carrier or tower owner has received proof that the unsafe condition has been eliminated.
- Carriers and tower owners should automatically launch an investigation into all serious injuries and fatalities to establish the cause of the incident.
  - Any findings that indicate a contractor's inadequate compliance with safe work practices should be flagged for action.

- The findings of these investigations should become part of a contractor's safety record with the carrier and tower owner, and should be factored into annual reviews and future contracting opportunities.

Auditing

- Carriers and tower owners should perform random audits on projects to ensure the use of safe work practices.
  - Among other things, carriers and tower owners should enforce the consequences called for in applicable contract language when contractors fail to ensure that work is performed safely and track and audit the application of those consequences.
  - Independent third parties should perform these audits to ensure neutrality.
  - Findings of significant safety issues may be grounds for contract termination.
- In addition to random on-site audits, carriers and tower owners should perform regular, scheduled reviews of contractors and their safety records.
  - These reviews should focus in particular on past reports of safety issues and the measures taken to address them.

Training

- Carriers and tower owners should support the development of industry-wide, recognized training standards and then may require their contractors to comply with those training standards.
- When vetting contractor training programs, carriers and tower owners should ensure that contractors are providing sufficient oversight of "train

the trainer" programs to confirm that employees at all levels are receiving quality training.

- It is strongly recommended that carriers and tower owners verify the training and certifications carried by the employees of contractors.
  - This is primarily to ensure that all contractors working on a carrier or tower owner's project have obtained a minimum level of training and certification.

Recordkeeping and communication

- Carriers and tower owners should know the identities of the contractors performing work on their projects at all times.
  - Maintaining records of projects and the contractors working on them will prevent unvetted contractors from entering worksites.
  - If a contractor is found on site without prior approval (or if their approval has been revoked), they should be removed from the site immediately.
- Carriers and tower owners should maintain a comprehensive electronic inventory system of all towers and antennas.
  - This system should include detailed information on each of the company's assets, including antennas, equipment, and towers. This information should include as-built drawings, project/work history, and a listing of reported unsafe conditions along with confirmation of repairs.
  - This information should be available to all parties working on a particular project because it is critically important to ensuring that work can be completed in an effective, timely, and safe manner.

- The information contained in these systems should be audited and updated on a regular basis to ensure accuracy.

- All information pertaining to work on communication towers, including structural information, work history, needed repairs, etc., should be freely shared.
  - Carriers and tower owners should ensure that any critical information they have is shared down the contract chain, and they should also ensure that important information is being shared up the contracting chain.
  - Carriers and tower owners should make every effort to ensure that they receive timely information about safety-related issues on their projects from the work crews on site.

Carriers

Project timelines

- Currently, many carriers calculate project schedules based on historical data, which, due to factors associated with a particular job, may not allow enough time for a contractor to complete the work.
  - Carriers should ensure that they take into account all of the factors of each individual project when creating project schedules.
  - These factors can include tower worksite location, tower type, scope and complexity of work to be completed, environmental and weather-related factors, travel time, and equipment delivery schedules.
  - This will ensure that contractors have enough time to complete work in a safe manner.

- Additionally, it is typical to have delays or unanticipated conditions on every work site.
- Planning for flexibility in project deadlines can help protect against safety lapses that result from hasty work.

- Carriers should take proactive steps to guard against employee fatigue.
  - The hazards presented by employee fatigue can be greatly reduced by, among other measures, minimizing long drives to and from work sites.
  - Due to the remote location of many communication tower work sites, carriers should give special consideration to travel time when setting project schedules.
  - Setting limits on drive times and "high time" (or, time spent on the tower) can promote climber safety and also demonstrate to contractors that minimizing employee fatigue is a high priority.

Tower owners

Tower inspection and maintenance

- Tower owners should ensure that their towers are maintained properly, and that structural inspections are conducted on a regular basis. All towers should have a means for safe access (including having unobstructed ladders that are in good repair) and methods for managing radio frequency hazards, and should be inspected regularly for structural soundness. Tower owners are strongly encouraged to have a properly installed, maintained and functioning safety climb system.
- Towers that do not currently have engineered anchorage points should be

designated for retrofitting with engineered anchorage points wherever possible. Towers that cannot be retrofitted with engineered anchorage points should be designated for replacement with a tower that can provide engineered anchorage points and work platforms.

- Tower leases should mandate that no equipment may be installed in such a way that it prevents access to engineered anchorage points, and that any lessee who installs equipment that compromises an engineered anchorage point or safety climb system is responsible for replacing that system or installing a new engineered anchorage point.
- Tower owners should meet or exceed the standards established in recognized consensus standards governing the construction and maintenance of communication towers, including TIA-222-G, Structural Standard for Antenna Supporting Structures and Antennas.
- Tower owners should establish a clear procedure for reporting unsafe conditions on towers and ensure that all reported conditions are tracked until the hazardous conditions have been fixed.
- A number of companies have begun using drones for tower inspection. This technology has the potential to reduce unnecessary climbing and can avoid putting employees at risk.
- Tower owners are strongly encouraged to require contractors to send photos of completed work to their central command centers. The command centers can then assess and approve the work before the employee even descends the tower. This can reduce unnecessary climbing for redoing completed work.

Turfing Vendors

Training

- Turfing vendors should require all field supervisors and crew members (including those working for contractors) to be adequately trained for their assigned work activities and require that all training be documented.
- In addition to job-specific training, turfing vendors should require all supervisors and crew members to complete an orientation prior to beginning work. This orientation should cover all relevant safety and health requirements, including appropriate procedures for performing the crew members' work tasks, the safety and health hazards associated with those tasks, and the appropriate measures that need to be taken to mitigate those hazards.
- When vetting contractor training programs, turfing vendors should ensure that there is adequate oversight of "train the trainer" programs in order to confirm that employees at all levels are receiving adequate training.
- One purpose of training is to set expectations. Turfing vendors should set the expectation with all contractors that they place the highest priority on safe work practices and that there is no reason for a contractor to ever take shortcuts on safe practices. Establishing an expectation of zero tolerance towards unsafe practices is critical to changing the safety culture.

Communication, reporting and incident investigation

- Turfing vendors should establish a command center staffed with subject matter experts who are equipped to immediately respond to inquiries and to assist with troubleshooting issues

from the field. This can facilitate safe work practices — for example, when the turfing vendor is responsible for assessing and approving work procedures and products, a tower crew can take photos of a tower's rigging and an expert in the command center can approve the rigging plans and the actual set-up before lifting commences. Crews can also send photos of completed work to the command center so that work can be assessed and approved immediately. This type of quality control can minimize unnecessary climbing for redoing completed work.

- Turfing vendors should ensure an open flow of communication between carriers, tower owners and contractors. It is vital that contractors have all relevant information to safely complete work activities. Often contractors encounter safety issues on sites that tower owners and carriers are not aware of, and the responsible parties need to be made aware of these situations. Turfing vendors can ensure that the relevant parties in the contracting chain are exchanging necessary information.
- Turfing vendors should ensure that procedures are in place for reporting unsafe conditions on tower worksites. These procedures should be as straightforward and simple as possible to encourage timely reporting of unsafe conditions. When the reporting procedure is not transparent or responsive, it discourages reporting.
- Turfing vendors should have a company representative on site while work activities are being performed to ensure that safe practices are followed. At a minimum, if a representative cannot visit every site, turfing vendors should have

representatives perform periodic, random safety audits to ensure that work is being done in a safe manner. There should be specific consequences when unsafe conduct is discovered.

- When a near miss, injury or fatality is reported on a work site, the turfing vendor should immediately stop all work and begin an investigation into the causes of the incident.

Work site safety practice

- Turfing vendors should require a Job Hazard Analysis (JHA) to be completed by all contractors working on site. The JHA should be required on-site documentation for all work activities.
- For a description of critical elements in a Job Hazard Analysis, please see the "Work site safety practices" section in Tower Construction and Maintenance Contractors.
- Turfing vendors should establish a strict, zero-tolerance policy on free climbing.

Tower Construction and Maintenance Contractors

Auditing and incident investigations

- Whenever an injury or fatality occurs on a work site, contractors need to notify all appropriate authorities, including, as necessary, local emergency services and OSHA[2]. Then contractors should follow their own internal policies as well as the policies of the turfing vendor, tower owner and carrier for reporting incidents.

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2. For more information on OSHA's mandatory reporting requirements for employers, see www.osha.gov/report

- Contractors should have internal policies for investigating incidents that take place on work sites in order to determine the root cause of the incident. They should also have policies on what to do with the results of these investigations, to ensure that lessons learned from the root causes are applied to work practices in order to make them safer.
- If the incident is due to the actions of an individual employee, then the contractor should re-examine internal policies for employee training and re-train the individual (and all employees if needed). If the cause of the incident is a deficiency in the contractor's safety and health program, the contractor should immediately audit its safety and health program and correct any deficiencies that are found.

Work site safety practices

- All contractors should require supervisors to conduct a tailgate meeting at the beginning of each work day. The purpose of these meetings is to highlight the most important safety issues for the day. These meetings should cover the location of rescue equipment, possible hazards specific to the jobsite, the need for personal protective equipment (such as hard hats and eye protection), the need to be aware of overhead hazards (especially during lifts), and the importance of keeping clear of the load. Other critical topics include the location of the nearest hospital, and how to direct someone to call 911 in an emergency.
- Before any employee sets foot on a job site, the contractor should complete a comprehensive Job Hazard Analysis (JHA). The JHA should be required on-site

documentation for all work activities. The JHA should provide an overview of the location of the work site, the type of tower, and the work to be done. It should include the precise location of the work site and the location of (and contact information for) all local emergency services (including the nearest hospital or medical center). It should provide a detailed analysis of each individual job task to be completed, as well as information about the hazards associated with that task and the preventive measures necessary to avoid those hazards (including applicable personal protective equipment). The JHA should include a list of all personnel working on site, along with information regarding the training and certifications held by each individual. Finally, the JHA review should include a mental and physical check-in with climbers. Do they feel mentally and physically ready to climb safely that day? If there are any situations or conditions that may prevent them from being focused on climbing safely, the foreman should have and exercise the authority to relieve that climber from climbing duties.

- For work sites where personnel will be working at heights and/or where hoisting of personnel or materials will be performed, a more detailed JHA should be used, and should include specific hazard control measures unique to the work activities being performed on that job site.
- Contractors should institute work policies and procedures designed to ensure that safe work practices will always be followed on site. For example, when contractors begin every single work day with a tailgate meeting discussing the day's work, and then immediately follow the meeting with daily equipment inspections, critical safety practices are less likely to be overlooked.

- Contractors should ensure that all employees are aware of existing consensus standards governing communication tower work and are familiar with the provisions of those standards that apply to their work activities. They should make compliance with applicable provisions of consensus standards an element of the safety and health program.
- Contractors should ensure there is adequate supervision of employees during work activities and make sure that all employees follow safe work practices (like 100 percent tie-off).
- Contractors should keep track of employee work schedules, including travel and driving time, to ensure that employees are not climbing while fatigued.
- It is quickly becoming a recognized best practice in the industry to institute a zero-tolerance policy regarding unsafe practices, and free climbing in particular. Contractors with exceptional safety programs institute policies that mandate 100 percent tie off. When an employee is found to be violating company policy by free climbing, employers should initiate appropriate corrective actions, which can range from mandated re-training to other actions, depending on the individual circumstances. Contractors can take a similar approach to other unsafe practices, including drug use and unsafe driving.

Recordkeeping and Communication

- Contractors should keep comprehensive records of all employee training and certifications, and should make those records available to carriers, tower owners, and turfing vendors on an as-needed basis.

- Contractors should obtain necessary technical and engineering specifications from tower owners and turfing vendors. It is critical to obtain recent and accurate information as part of the contracting process to enable work to be completed in a timely and safe manner.

Training

- Contractors should ensure that all employees who climb communication towers are trained for the tasks they will be expected to perform.[3]

Photo: iStock

- Contractors should ensure that employees new to tower climbing undergo comprehensive training as authorized climbers. After training, new climbers should be paired with an experienced climber as an apprentice until they have enough experience and climbing hours to undertake the competent climber training. New employees who have climbing experience should be closely monitored until their skill levels are known.
- Employees who will be expected to perform rigging or hoisting activities should have specialized training to ensure they can safely perform these tasks. Contractors should not expect "on the job training" to adequately prepare employees to perform these tasks.

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3. Telecommunications companies, industry associations, and the Department of Labor have established the Telecommunications Industry Registered Apprenticeship Program (TIRAP). TIRAP partners with stakeholders to promote safety, enhance quality, and enable education and advancement opportunities in the telecommunications workforce that will meet network infrastructure build out needs. TIRAP apprenticeships are now available to interested telecommunications companies. For more information see www.tirap.org/employer-involvement.

- Contractors should ensure that employees are re-trained at appropriate intervals, as well as on an as-needed basis. Failure to comply with safe climbing practices is one indication that re-training is needed.
- When making use of "train the trainer" programs, contractors should ensure that the employee who attends that training and then trains other employees is adequately prepared to train all employees. Additionally, contractors should perform regular audits of internal training programs to ensure that the training is sufficiently rigorous.

For additional information, please see OSHA's Communication Tower web site: www.osha.gov/communicationtower, or contact OSHA's Directorate of Construction at (202) 693-2020.

Additional Resources

Recommended Practices for Safety and Health Programs

OSHA has developed materials to help employers establish comprehensive safety and health programs. The following link provides valuable information to anyone wishing to develop a safety and health program, which can contribute to a culture of safety for communication tower employers and employees.

www.osha.gov/shpguidelines

In addition to the above resource, the National Safety Council's "Journey to Safety Excellence" webpage has information about safety and health programs and how they can work for a wide variety of industries.

www.nsc.org/measure/pages/journey-to-safety-excellence.aspx

For More Information

Contacting OSHA

To ask questions or to get more information about OSHA regulations, or to file a confidential complaint, contact OSHA at 1-800-321-OSHA (6742) or TTY: 1-877-889-5627 or go to www.osha.gov.

Contacting FCC

To ask questions regarding the content of this document or for more information about communications towers, please contact FCC: 1-888-CALL FCC (225-5322); TTY: 1-888-TELL FCC (835-5322) or visit the FCC website at www.fcc.gov.

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