Section 4.08 Tower Climbing Safety

1. Scope

This section applies to all Reclamation employees, contract workers, contractors, and subcontractors that work on communication towers, antennas, and antenna supporting structures, where workers are exposed to potential falls at heights.

2. General Requirements

a. Designation of a Regional Program Coordinator

Each region must designate a regional program coordinator (RPC) for tower climbing activities. In addition, each area office shall designate a local program coordinator (PC), as appropriate, who will work with the RPC.

b. Medical and Work Qualifications

Occupational Safety and Health Administration (OSHA) standards 29 CFR 1910 and 29 CFR 1926 and Departmental Manual Part 485 (485 DM) require that employees and contractors who work on towers must be medically qualified to perform those jobs; be trained and certified as qualified to perform those jobs; have the appropriate equipment to do the job; climb only towers that are certified, have passed a formal inspection within the last 5 years, and have passed a pre-climb inspection; and perform those jobs in accordance with this section and the Code of Federal Regulations.

c. Tower Certification

Tower climbers must only climb towers certified by the manufacturer to meet the specifications of the Telecommunications Industry Association's TIA 222-H, Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures, for towers and 29 CFR 1926 Subpart M, Appendix C, Personal Fall Arrest Systems – Non-Mandatory Guidelines for Complying with 1926.502(d), for anchorages. Towers that do not meet these standards must be red tagged with the words Do Not Climb until the towers are retrofitted or replaced with towers that do meet these standards. Until then, work activities must be accomplished by other methods (e.g., aerial devices).

d. Tower/Structure Inspections

- Formal Inspections. The RPC and regional safety manager (RSM) must ensure that all communication structures owned by Reclamation and subject to climbing are formally inspected every 5 years.
- Pre-climb Inspections. Prior to work/climbing, an inspection and site evaluation must be completed. At a minimum, the inspection must include the following steps:

- determine the type and height of the tower, the location and types of antennas, and the tools and safety equipment required to perform the job,
- determine if access to the site requires notification to the owner (if not a Reclamation tower),
- review the last formal inspection,
- determine if the structure seems to be sound, if guyed wires are secure and in good condition, if ladders and bolts are secure, and if safety cables are installed and in good condition,
- check for signs of rust or degradation of the structure (for example, movement or degradation of the foundation slabs),
- determine the path to climb and whether any equipment needs to be turned off or reduced,
- check that the weather is adequate for climbing and if changes in the weather are expected during the climb,
- verify and document that all personal protective equipment (PPE) used for the climb is in good condition,
- ensure communication methods and expectations are in place and review them with the climbers and ground crew, and
- ensure that an emergency medical and rescue plan has been developed and review it with all participants.

e. Emergencies

Situations where an imminent threat to human life exists because of the lack of telecommunications services may require prompt performance of tower or elevated work. Every effort must be made to perform a hazard/risk assessment of the work in accordance with RSHS Section 1.04, Work Planning. At a minimum, a pre-climb inspection must be performed, and any emergency work performed that does not comply with this section must be clearly documented and reported to the RPC and the RSM prior to beginning work.

f. Stop Work Criteria

The employees climbing towers are the ones at risk and have the responsibility for determining whether to climb a tower or do elevated work based on their hazard assessment of the job task. If any involved employees feel an unsafe situation exists, they have the right to stop work and follow the stop work procedure in SAF P01, Appendix A, which is located on the “Policies” page of the Reclamation Manual website.

3. Responsibilities

a. Reclamation Safety and Occupational Health Office

- Shall provide safety assistance to tower climbing PCs and provide direction to regions on implementing the Department of the Interior Occupational Medicine Program Handbook.

b. Regional Director

- Shall appoint an RPC that has appropriate experience and has completed the required training outlined in paragraph 4.08.4 to ensure that the requirements contained in this section are met for all tower climbing and elevated work activities and that a tower climbing program is established in accordance with the requirements in this section.

c. Area Office Manager

- Shall ensure all affected employees and outside contractors are trained on and comply with this program.
- Shall provide necessary resources to implement and maintain the procedures in this section.
- Shall select a PC, as appropriate, that has been approved by the RPC and provide them with the authority to implement the procedures of this section.

d. Regional/Area Office Program Coordinators

- hall draft, monitor, periodically review the effectiveness of the region's tower climbing program and make revisions as necessary. This may include conducting inspections of tower climbing activities, reviewing equipment, reviewing contractors working on Reclamation's behalf, and conducting meetings with project managers to review tower climbing practices.
- Shall ensure that the proficiency requirements for employees performing climbing activities are met, that employees receive the proper training in the use/care/inspection of fall protection equipment, and that climbers are tested for knowledge, understanding, and competency for their region's tower climbing program.
- Shall maintain an inventory of qualified climbers and ensure that an annual inspection of PPE is completed.
- Shall participate in the development and implementation of a regional tower climbing program and generate an annual status report to the RSM.
- Shall, in coordination with safety staff and supervisors, conduct accident investigations to determine the root cause of any accident and prescribe corrective actions to prevent future accidents.
- Shall complete the required training outlined in paragraph 4.08.4 to ensure that the requirements contained in this section are met for all tower climbing activities and that a tower climbing program is established in accordance with the requirements in this section.

e. First-Line Supervisors

- Shall perform periodic assessments to ensure that employees performing tower climbing activities follow all program requirements and good safety practices.

- Shall ensure that employees performing tower climbing activities have current medical clearances and are provided with tower climbing and fall protection courses that meet the training requirements contained in this section.
- Shall maintain position descriptions that accurately relate to tower-climbing physical requirements and abilities.
- Shall be aware of, to the best of their ability, any health issues that would restrict an employee from tower climbing activities and shall notify the RPC and/or area office PC of such restrictions.
- Shall ensure that a job hazard analysis (JHA) is completed for all tower climbing activities and that work procedures are clearly defined and well understood by the work crew.

f. Onsite Job Leads

- Shall have completed formalized training documenting that they have the skills necessary to identify the type of fall protection system required for the climb, to ensure that fall protection equipment is inspected prior to each use, and to be able to identify safety issues during the climb.
- Shall ensure that a JHA is completed, that specific work procedures are clearly defined and well understood by the work crew, and that a minimum of two qualified climbers are required for each tower climbing activity.
- Shall evaluate, to the best of their ability, the physical condition of the climbers before allowing them to climb and shall notify the RPC if a climber is medically restricted to climb and again when medical restrictions have been lifted.
- Shall stop work when safety concerns are identified until the issue is resolved per SAF P01, Appendix A.
- Shall be aware of changes in conditions and events as the job progresses that may require review and modification of the fall protection system in use or the work procedure plan.

g. Tower Climbers

- Shall attend a working-at-heights qualified climber training course that covers tower climbing, fall protection, and rescue competent person and that results in certification as a qualified climber.
- Shall complete a physical every three years, as required in 485 DM.
- Shall ensure that, before climbing, they understand the hazards and the danger involved with climbing, use personal fall protection equipment, meet the requirements of a certified qualified climber, and participate in the development of a JHA so they understand the safety and health requirements and work procedures of the job.
- Shall always adhere to the 100 percent tie off requirement. No one is to ascend or descend a tower unless their hands are free.

- Shall regularly use and document the inspection of their PPE that includes fall protection equipment to ensure that it is in good working condition before each use and that it is in accordance with the manufacturer's recommendations.
- Shall assess the conditions or potential conditions that could impede a safe climb and then determine whether it is safe to climb. Conditions may include, but are not limited to, hazardous weather, insect or animal infestations, unavailable or damaged PPE, tower damage or insufficient tie off points, etc. Climbers must only climb in conditions that are determined to be safe and must inform their management if they believe that a climb presents an unusual risk to their safety and/or health so it can be mitigated.
- Shall inspect all PPE, including fall protection equipment, before each use to ensure that it is in good working condition, document the inspections, and ensure that PPE is used in accordance with the manufacturer's recommendations.
- Shall make the onsite job lead aware of any physical conditions that may impact their ability to perform the work safely.
- Shall not climb at a site without another qualified and competent person present.

h. Regional Safety Manager

- Shall assist in developing and establishing the tower climbing program. The RSM, in cooperation with the RPC, must perform periodic spot checks to ensure compliance with this program and provide guidance for the regional radio frequency (RF) safety program. The RSM, in coordination with the RPC or local PC, shall assist supervisors and/or climbers in arranging for training and for purchasing approved fall protection equipment.

i. Project Manager/Acquisitions

- Shall ensure than an evaluation of a contractor or subcontractor has been conducted to confirm that the contractor is competent and qualified for tower construction, maintenance, etc., prior to signing a contract and initiating any work with the contractor.

4. Training Requirements

The training and qualification of employees for tower climbing consists of a 40-hour Competent Tower Climber and Rescue course that is approved by the RPC that meets the training and qualification requirements under this section. Required training must include both classroom instruction and actual field demonstration of the topics discussed in the classroom. Upon successful completion of "Competent Tower Climber and Rescue" course training and the required medical clearance and additional training outlined in section 4.08.4.a.3, climbers shall be certified as qualified climbers. An industry qualified instructor must conduct all classroom instruction, field demonstration, and testing for Reclamation-sponsored courses. Climbers will be tested for knowledge, understanding, competency, and proficient demonstration of use and maintenance of each piece of equipment used for tower climbing activities in their region's tower climbing program by their regional or local PC.

a. Initial

- Minimum Requirements. At a minimum, climbers must be trained in the following:

  - the nature of fall hazards on towers,
  - fall protection requirements,
  - use and care of a full body harness, including inspection and storage,
  - proper anchoring and tie-off techniques and reduction in strength caused by certain tie-offs,
  - maximum allowed free-fall and total fall distance,
  - determination of elongation and deceleration,
  - safety climbing devices,
  - proper rigging techniques,
  - tower climbing,
  - transferring between equipment and structures,
  - recognizing and avoiding dangerous conditions while at the same time mastering the difficulties of climbing, resting, and positioning for work on various structures,
  - methods for identifying energized power lines, apparatus, and other auxiliary equipment on the tower,
  - requirements for working on and around a structure near energized power lines, and
  - recognizing emergencies and selecting and using the appropriate rescue techniques and equipment.

- Medical Exam Required Before Training. Prior to attending training, climbers must pass the medical standards examination outlined and described in the Occupational Medicine Program Handbook. This examination describes the physical requirements needed to fulfill the qualified climber classification. The completed examination must be retained in the employee's official medical folder. A clearance stating only that the employee has passed the medical requirements must be provided by the physician conducting the examination to the RPC and the local PC if one is designated. If a climber does not meet the medical qualification but does meet all other requirements, he or she can be recertified after completing the medical examination, at which time the RPC or local PC shall document the recertification by making an entry in the climber's climbing record.
- Other Required Training.

  - First Aid/CPR Training. Qualified climbers and ground personnel must be trained in first aid and CPR and have a valid certificate from the American Heart Association or American Red Cross. This certificate must be obtained prior to any Reclamation-sponsored climbing training. Reclamation must provide first aid and CPR training to meet this qualification.
  - Radio Frequency Energy Training. Qualified climbers that could potentially be exposed to radio frequency energy (RF/EME) hazards must be trained in the

potential hazards of RF/EME and how to contain exposure to within acceptable limits.

- Electrical Safety Training. Qualified climbers that could potentially be exposed to electrical hazards must be trained about the electrical hazards they could encounter when climbing and any other relevant electrical safety procedures. All climbers working on electrical installations must have the appropriate training requirements for electrical work.

b. Certification

Documentation must consist of a certificate indicating that the individual has successfully completed the course of instruction and has the skills required to be proficient in the tower climbing program requirements in this section. Demonstrated proficiency must be included in the documentation. The documentation must be retained in an agency system of tracking training, and a copy must be forwarded to the RPC and the local PC if one has been designated.

c. Refresher/Recertification

Recertification involves an annual review of the qualified climber's record by the RPC and/or the local PC if one has been designated to determine when the qualified climber last performed a climb, last attended a Reclamation-approved tower climbing class, last completed a medical qualification per the Occupational Medical Program Handbook, and last attended a first aid/CPR class. The qualified climber's record will be updated to verify that they are either proficient or deficient in any of these requirements, as outlined in paragraph 4.08.4.d.

d. Proficiency Qualification

Qualified climbers must maintain proficiency in climbing and must receive periodic training in first aid/CPR, safety equipment, and climbing procedures to ensure skills are continuously developed. A qualified climber is considered proficient if they have:

- climbed at least twice in the past year,
- met the recertification requirements in paragraph 4.08.4.c, and
- been to a Reclamation-sponsored tower climbing course within the past 3 years.

The RPC and/or local PC shall document recertification by making an entry in the worker's climbing record.

e. Lack of Proficiency

If a qualified climber does not meet the proficiency requirements in paragraph 4.08.4.d, then they must correct any deficiencies by completing the appropriate training as outlined in paragraph 4.08.4.a.

f. Recordkeeping

All climbing training certificates, recertification statements, and medical clearances pertaining to a climber must be maintained for the duration of the qualified climber's employment. Training records must be kept in the agency system of tracking training, and courtesy copies of training and medical clearances must be sent to the RPC. Upon request, Reclamation must give the Deputy Commissioner of Labor for Occupational Safety and Health (or designee) access to the following:

- Training Records. All material related to the employee's training and education record.
- Medical Records and Non-ionizing Radiation Exposure Records. All medical records, in accordance with 29 CFR 1910.1020(d)(1)(i), and any material related to each analysis using exposure or medical records, in accordance with 29 CFR 1910.1020(d)(1)(iii).
- Equipment Inspections and Testing Records. All material related to the modification, repair, testing, calibration, or maintenance service of all climbing equipment.

5. Hazard Identification, Assessment, and Safety Measures

a. Before Climbing

A hazard assessment must be conducted to identify, assess, and control employee exposure to hazards as required by RSHS Section 1.04 and any other applicable rules or regulations. The severity of identified hazards must be reviewed, and control measures must be implemented using the hierarchy of controls and include rescue procedures and equipment to be used in the event of an injury. Results of the hazard assessment must be documented in the JHA. The JHA must be reviewed and signed by the work crew and onsite job supervisor prior to climbing.

b. Emergency Medical and Rescue Plan

An emergency medical and rescue plan must be developed as part of the JHA, and appropriate changes or additions must be made after it has been reviewed with the work crew. The plan must ensure prompt rescue of qualified climbers or a means to self-rescue (e.g., providing controlled descent devices, radios, etc.). Rescue of fall victims must be included in all training and job planning. Aerial devices, cranes, lifelines, or other devices capable of lifting the climber must be readily available. A critical lift plan, outlined in RSHS Section 3.03 and 3.04, is required when hoisting from a tower. This includes hoisting with gin poles, lifting blocks, etc. Rigging and riggers must meet requirements contained in RSHS Section 3.02, Slings and Rigging Hardware. At a minimum, the plan shall include:

- a procedure to be used in the event of a medical emergency or tower rescue that includes the use and availability of a competent rescuer to ensure the safest rescue is planned and conducted;
- emergency phone numbers for the specific site and what type of communication equipment is available to notify emergency or medical response services; and

- notification procedures in case of serious injury or death to ensure that the proper authorities and Reclamation officials are notified.

6. Pre-job Briefing and Planning Requirements

Before any climbing takes place, a safety meeting must occur with all qualified climbers and ground support personnel and cover specific information about the tower, the climb, PPE, communication needs, and steps that need to be taken if working near power lines. In addition, a site safety briefing must be held at the beginning of each day, new job, or if there is a change in work procedure(s) to review the potential hazards involved in the work to be performed and the rescue methods available. These discussions help to ensure the availability of proper rescue equipment and quick rescue of the worker. Prior to beginning the job, local emergency response must be provided information about the location of tower and the activities to be completed in case emergency response is needed.

7. Hazardous Environmental Conditions (Weather/Other)

a. Weather Conditions

The weather must be safe and stable for the climb to occur. Never climb when lightning or thunder is known to be or expected in the area. Extreme caution must be used during rainy, icy, or other conditions that may significantly increase the risk of the climb and/or degrade the structure. Wind speed criteria must be documented in the JHA that outlines when it is safe and not safe to climb.

b. Night and Low-Visibility Climbing

Climbing during daylight is always preferred, but it may be necessary under some circumstances to climb at night or during a time of low visibility, such as in fog. The RPC/local PC must approve all night climbs. Extreme caution must be exercised during such climbs.

c. Lighting for Night and Low-Visibility Climbing

All qualified climbers must use flashlights or other lighting equipment attached to their safety helmet to identify them from the ground and to observe the climber's performance. Additional flashlights may be used as needed; however, these must be attached to the climber in a manner that will not restrict the climber's movement or safety. Other lighting equipment must be available and used on the ground to provide adequate lighting.

8. Personal Protective Equipment

At a minimum, employees working on or around towers must wear and use the following PPE:

- personal fall arrest system,
- energy absorbing lanyards and restraint lines,

- head protection - that meets ANSI/ISEA Z89.1 Type-2 requirements to provide both protection for overhead impact, such as falling tools, or lateral impact that could result in fall,
- protective footwear,
- rescue/retrieval kit,
- RF personal monitors (based on site specific hazards),
- hand protection (safety gloves),
- safety glasses or safety goggles,
- hearing protection,
- communication device (e.g., radio, phone, mobile phone),
- wet-weather gear (based on site specific hazards),
- personal portable light for night work (based on site specific hazards),
- pole strap (based on site specific hazards).

Refer to RSHS Section 1.14, Fall Protection, and Section 1.07, Personal Protective Equipment, for additional information.

9. Safe Practices

When tower climbing, always follow safe climbing practices and watch for any unsafe climbing practices by others at the job site. All unsafe climbing practices must be eliminated or corrected before accidents occur. The following minimum safe climbing practices are required while working on towers:

- climb while rested and not fatigued,
- do not climb through or past unprotected electrical conductors,
- perform a visual inspection of the tower and PPE before climbing,
- only attach to a tower that has an adequate anchorage point,
- maintain 100 percent tie-off,
- do not throw any material up or down while on the tower,
- always maintain three points of contact with the tower,
- do not hold or attach onto antenna lines, coax, conduits, etc., for support,
- do not climb while ill or under the influence of prescription medication that could impair your judgment or physical abilities,
- do not climb while under the influence of alcohol or drugs, and
- never climb without another qualified climber.

a. Non-ionizing Radiation

- Radio Frequency Standards. The RPC/PC in coordination with the RSM must ensure that employees performing work on communication towers are not exposed to RF electromagnetic fields beyond the Federal Communications Commission maximum

permissible exposure limits in 47 CFR 1.1310, Radiofrequency Radiation Exposure Limits, and 29 CFR 1910.97, Nonionizing Radiation.

- Radio Frequency Exposures. Employees must not enter areas where RF exposure levels are above the general population/uncontrolled maximum permissible exposures described in 49 CFR 1.1310 without exercising controls as described throughout this section.
- Radio Frequency Control. Before qualified climbers perform work in areas on a communication tower where RF exposure levels exceed the occupational/controlled maximum permissible exposure values stated in 47 CFR 1.1310, written control procedures must be included in the JHA for reduction, elimination, avoidance, or protection from such RF levels. These written control procedures must include strategies for minimizing the exposure, locking out the hazard, using engineering and administrative controls, and prohibiting access, as described in the following paragraphs.

    - Minimize the Exposure. Reduce the transmitter power to a level that ensures RF exposure levels in areas where employees are working do not exceed the occupational/controlled values stated in 47 CFR 1.1310 and ensure that the transmitter power level is not increased until all employees have ceased working in those areas. If this method is chosen, the transmitter power must be locked out and tagged out at the reduced level by a competent person in accordance with 29 CFR 1910.147 and Reclamation's Facilities Instructions, Standards, and Techniques (FIST) 1-1. Prior to removing lockout/tagout devices and restoring the original transmitter power level, all employees must be notified and the work area must be checked to ensure that all employees have been safely positioned and removed.
    - Lock Out the Hazard. If the transmitter power level in areas where employees are working cannot be reduced and maintained at a level that ensures RF exposure levels do not exceed values stated in 47 CFR 1.1310, the transmitter power must be locked out and tagged out by a competent person in accordance with 29 CFR 1910.147 and FIST 1-1. Prior to removing lockout/tagout devices and restoring the transmitter power level, all employees must be notified and the work area must be checked to ensure that all employees have been safely positioned and removed.
    - Use Engineering and Administrative Controls. If the transmitter power level cannot be reduced or eliminated, employees must be permitted to access areas where the RF exposure exceeds the values stated in 47 CFR 1.1310 by implementing engineering or administrative controls that comply with Federal Communications Commission regulations concerning such exposure, including limiting the duration of the exposure and utilizing monitoring equipment, RF protective clothing, and other related PPE.
    - Prohibit Access. If Reclamation cannot ensure that the above conditions are met, then employees must not be permitted to access areas where RF exposure levels exceed the values stated in 47 CFR 1.1310.

- Use of Controls. Before any qualified climber commences work on a communication tower, a competent person must assess potential RF hazards of areas that may be accessed by employees during their work and post temporary signage to indicate areas where the RF hazard exceeds the general population/uncontrolled maximum permissible exposure limits set forth in 47 CFR 1.1310. Temporary signage must remain in place as long as work is being performed and the hazard exists.
- Radio Frequency Safety Program. When employees are exposed to RF fields beyond the general population/uncontrolled maximum permissible exposure limits established in 47 CFR 1.1310, the employer must develop, implement, and maintain a written safety and health program with site-specific procedures and elements based on the electromagnetic radiation hazards present. Climbers must be trained in the use of a calibrated RF level monitoring device and must use it when working around or on a tower that may have active transmitters at or above 500 watts or where the status of transmitters is unknown.

b. Structure Requirements

- Ascending and Descending Structures. When safe climb devices are available and operational, they must be used to ascend and descend a communications structure. In situations where a safe climb device is not available or not operational, and climbing has been determined necessary, qualified climbers must be allowed to climb while maintaining 100 percent attachment (tie-off) to a suitable anchorage point.

    - Fixed Ladders. When provided, fixed ladders must be used for ascending and descending communications structures, except where work assignments or conditions dictate otherwise.
    - Portable Ladders. Portable straight or extension ladders must be placed at an angle that does not permit slippage of the ladder base when climbing (the minimum standard is a 4:1 vertical to horizontal ratio). Unsecured ladders must be supported by a ground worker until the climber has secured (tied) the ladder and transferred to the structure. Reference 29 CFR 1910.23 "Ladders".

- 100 Percent Attachment. Transitioning to the work position must be accomplished while maintaining 100-percent attachment (tie-off) using a full body harness and lanyard or lifeline with an energy absorbing or self-retracting lanyard or lifeline. 100 percent attachment (tie-off) is not required while using approved work platforms that have guardrails and kickboards in accordance with 29 CFR 1910.29, “Duty to ahve fall protection and falling object protection,” and 29 CFR 1910.25, “Stairways.” Refer to RSHS Section 1.11, Walking and Working Surfaces, for specific information.
- Signage. The tower site must include all applicable warning and danger signs, such as those shown in Figure 4.08-1, in prominent locations.

FIGURE 4.08-1 Examples of warning and danger signs that my be required at tower sites.

- First Aid Kits. First aid kits that meet the requirements of 29 CFR 1910.151 and ANSI Z308.1, as outlined in RSHS Section 1.05, Medical Services and First Aid, are required on site at all towers.
- Site Access Controls. The tower site must have access controls such as gates, fences, lockouts for ladders, anti-climb devices, etc., to prevent unauthorized access and climbing by unauthorized persons.
- Fencing Around Towers. All towers and supporting equipment shall be enclosed by fencing not less than six feet in height. Guy anchors, if present, shall also be enclosed with six-foot fencing for protection. If this is not feasible, then supporting documentation must be provided in the formal inspection.
- Tower Lighting and Painting. Tower lighting and painting must meet the requirements of 47 CFR 17, Construction, Marking, and Lighting of Antenna Structures.

⚠ RSHS Appendix A: Definitions

RSHS Appendix A (Definitions) is available to print at: https://www.usbr.gov/safety/rshs/index.html.

⚠ RSHS Appendix B: Additional References and Citations

RSHS Appendix B (Additional References and Citations) is available to print at: https://www.usbr.gov/safety/rshs/index.html.