

AVISHKAR TECHNO SERVICES
TOWER CLIMBING FALL PROTECTION AND RF ENERGY PROGRAM

TOWER CLIMBING FALL PROTECTION AND RF ENERGY PROGRAM

Introduction

This program establishes standards and procedures to provide for the safety of telecommunications workers that climb, traverse, move, rest, and work on towers, poles or at elevated work sites.

AVISHKAR TECHNO SERVICES regards safety and health as the primary consideration in any job and is committed to preventing job-related accidents and illnesses by establishing and adhering to a Tower Climbing and Fall Protection Program. By establishing training, medical qualifications, physical fitness, equipment, conduct standards and consolidating the various industry and government standards on the subject, the program will be established and maintained at all levels.

General Requirements

- A. In accordance with 29 CFR 1910, 29 CFR 1926, it is required that all telecommunications employees and contractors who perform tower or elevated work must be determined to be medically qualified to perform those jobs, must be trained and certified as “Qualified” to perform those jobs, have the appropriate equipment to do the job, work on structures that are safe and perform those jobs in accordance with this program and the Code of Federal Regulations.
- B. Communications towers should be designed to eliminate or minimize the need for climbing. Qualified outside contractors should be strongly considered in fulfilling AVISHKAR TECHNO SERVICES requirements for communications tower climbing.
- C. Tower climbers shall only climb towers certified by the manufacturer to meet the Telecommunications Industry Association/Electronic Industries Association (TIA/EIA) 222 for tower construction and 29 CFR 1910.66 Appendix C for anchorages. Towers that do not meet these standards will be red-tagged as “Do Not Climb!” until they are retrofitted or replaced with towers that meet these standards. Service can be accomplished by other methods (i.e. aerial devices, etc.).
- D. Emergency situations in which an imminent threat to human life exists due to the lack of telecommunications services may require expedient performance of tower or elevated work. Every effort must be made to perform a risk assessment of such work in accordance with the AVISHKAR TECHNO SERVICES Risk Assessment and Management Policy. Any emergency work performed that does not comply with this program or the Code of Federal Regulations must be clearly documented and reported to the Safety Officer and Program Coordinator.

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E. The ultimate responsibility for determining whether "to" or "not to" climb a tower or do elevated work lays with the climber/worker them self as they are ultimately at risk.

Program Responsibilities

A. TITLE is responsible for developing, implementing and inspecting the AVISHKAR TECHNO SERVICES Tower Climbing and Fall Protection Program.

B. TITLE Program Director is responsible for providing safety assistance to the Tower Climbing and Fall Protection Program Coordinators. The National Safety and Health Office will ensure the standards comply with AVISHKAR TECHNO SERVICES policy and provide direction to the State/Center Directors when implementing the AVISHKAR TECHNO SERVICES Occupational Medicine Program for tower climbers.

C. TITLE is responsible for providing the Tower Climbing and Fall Protection courses meeting the training requirements contained in this program.

D. Tower Climbing and Fall Protection Program Coordinators will ensure that the established Tower Climbing and Fall Protection Program is carried out in an effective manner.

- Assure that employees receive the proper training required in the use, care, and inspection of fall protection equipment and ensure the proficiency requirements, which allow workers to perform climbing activities, are met.
- Participate in the refinement and implementation of a statewide Tower Climbing and Fall Protection Program.
- Maintain an inventory of qualified climbers, perform an annual inspection of PPE, and report to National Telecommunications Manager.
- Direct Supervisors are responsible for maintaining position descriptions that accurately relate to tower climbing physical requirements and abilities. In addition, supervisors shall be aware of health issues with employees who climb, and climbers adhere to good safety practices.

E. Job Supervisors, in concurrence with the crew, shall specify the fall protection system to be used before engaging in the work activity. The job supervisor shall:

- Ensure that the AVISHKAR TECHNO SERVICES Risk Management Worksheet Form is completed, and pertinent work procedures are clearly defined and well understood by the work crew.
- Evaluate the physical condition of the climbers before allowing them to climb. If a work crewmember identifies a safety concern, the job supervisor shall stop all work until the issue is resolved. As the job progresses, the job supervisor shall be aware of changes in conditions and events that may require review and modifications of the fall protection system in use or work procedure plan.
- Require that all climbing and fall protection equipment be inspected prior to each use.
- Contractors will use only qualified climbers and shall follow all state, local, and federal laws for tower climbing and fall protection.

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F. Work Crews. The supervisor and each member of a work crew have the responsibility to adhere to fall protection rules and procedures and identify unsafe and unhealthful conditions that exist or are anticipated at a job site. They are required to participate in the development of a risk assessment of the job task to obtain an understanding of the safety and health requirements and the work procedures of the job. Workers shall be responsible for inspecting their personal fall protection equipment prior to each use. Workers will make the job supervisor aware of any physical conditions that may impact their ability to perform the work.

G. Safety Managers. The AVISHKAR TECHNO SERVICES Safety Manager should assist in the development and establishment of the Tower Climbing and Fall Protection Program. The Safety Manager, in cooperation with the Program Coordinator, will perform periodic spot checks to ensure compliance with this program. The Safety Manager should assist supervisors in arranging for training and the purchase of approved fall protection equipment.

Personal Protective Equipment

A. General.

This chapter identifies the application of Personal Protective Equipment (PPE) utilized by workers while climbing, resting, and performing work at elevated locations. The equipment described is utilized to help place the worker in a desirable working position and to reduce the probability of potential fall accident injuries.

- Personal protective equipment is to be stored in a dry, dark, secure area and protected from cuts, abrasions, and chemicals when not in use.
- Mandatory inspection of equipment before each use by the user will serve to minimize accidents resulting from deterioration of equipment. All fall protection equipment shall be periodically inspected by the program coordinator on an annual basis and a record of the inspection shall be maintained in the office or site files.
- Manufacturer's instructions and recommendations shall be incorporated into inspection, replacement, and preventive maintenance programs. Defective equipment shall be immediately removed from service and tagged "Do Not Use" until repaired. If defective equipment is determined to be non-repairable, it shall be disposed of immediately.

B. Fall Prevention/Positioning System

1. Full Body Harness.

- A full body harness, as defined in 29 CFR 1926.500, means straps which may be secured about the worker in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders. It will be provided with a means for attaching to other components of a personal fall arrest system. As of January 1, 1998, the use of a body belt (safety belt) for fall arrest is prohibited.

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- Full body harnesses used by AVISHKAR TECHNO SERVICES employees shall be certified by the manufacturer to meet all OSHA standards and regulations. It is recognized that many different body harness designs are available to climbers that offer advantages for certain tower structure designs and for the type of work to be performed. The climber may use personal preference in selecting the most appropriate harness to wear and shall ensure the harness fits properly.
 - A full body harness, when used in conjunction with pole climbers, permits work positioning and limits the exposure to falls while the worker has both hands free to perform a work task. A full body harness with positioning strap or lanyard however, will not prevent falling vertically (sliding) down wood poles. The full body harness, with a positioning strap or lanyard, is a fall prevention system when the positioning strap or lanyard will limit falls to 2 feet (610 mm) or less. Non-composite (100 percent leather) positioning straps and body belt buckle straps shall not be used.
 - Full body harnesses shall have a chest strap and a seat strap to distribute part of the load across the buttocks. The D-ring located at the center of the upper back will be the connection point for a fall arrest safety lanyard to distribute forces to the body most effectively. The D-ring located front and center of the upper chest may be worn when the work procedure warrants.
 - Full body harnesses shall be periodically inspected for the following:
 - i. Cuts, tears, and chafing.
 - ii. Electrical burns.
 - iii. Physical deterioration.
 - iv. Ultraviolet deterioration.
 - v. Wear on connection devices.
 - vi. Evidence of shock loading.
 - vii. Chemical damage and/or deterioration.
 - viii. Suspect body harnesses shall be destroyed.
 - Body harnesses shall be stored in a dry, dark, and a protected environment.
2. Positioning Strap/Rope Lanyard.
- Positioning straps or rope lanyards shall have each end snapped into a separate D-ring of full body harness when in a rest or work position. Rope lanyards will be spliced by the manufacturer or his qualified representative to connect fittings, other ropes, extensions, and attachments with a minimum four tuck splice.
 - i. Snaphook gates shall face outward away from the worker's body. As of January 1, 1998, the use of non-locking snaphooks as part of a personal fall arrest system and/or positioning device is prohibited. Multiple snaphooks of the locking type and/or approved carabineers may be attached to a single D-ring.
 - ii. Tools, handlines, or other objects that may interfere with the snaphook and cause rollout shall not be attached to or hung from the positioning strap.
 - iii. Positioning straps and rope lanyards shall be inspected for the following:
 - Snaphook keeper spring tension
 - Exposure of colored wear-warning inner layer.
 - Elongation of holes in positioning strap material.

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- Cuts, burns, extra holes, or fraying of material.
- Loose or worn rivets.
- Cracks, burns, or corrosion in the snaphook.
- Excessive side movement of the snaphook keeper.
- Chemical damage and/or deterioration.

3. Pole Climbers/Gaffs

- Pole climbers may not be used if the gaffs are less than 1-1/4 inches (32 mm) in length as measured on the underside of the gaff. The gaffs of pole climbers shall be covered with gaff protectors when not being used.
- Pole climbers shall be inspected before each use and shall be inspected for the following conditions:
 - Fractured or cracked gaffs or leg irons.
 - Wear on stirrup and leg irons.
 - Loose or dull gaffs.
 - Proper sharpening of gaffs.
 - Broken straps or buckles.
- If any of these conditions exist, the defect shall be corrected before the pole climbers are used.
- Pole climbers may not be worn when working on ladders (unless using the wood structure as access to a work position on a ladder) or when working from an aerial device. Pole climbers may be worn on ladders, in aerial devices, or when walking if used as part of an access system incidental to work activity. American Standards of Testing and Measurement (ASTM) F887-91a provides detailed information for care of pole climbers.

C. Fall Arrest Equipment

1. General.

All fall arrest equipment shall have locking-type snaphooks or approved carabineers that meet or exceed applicable OSHA and ANSI requirements. This equipment minimizes physical trauma to the worker, comfortably supports the worker after a fall until a rescue can be made and suspends the worker in a more easily retrievable position for rescuers.

- Fall arrest equipment should be attached to an anchorage as described in 29 CFR 1926.502 SubPart M. Regardless of the attachment height, the length of the body attachment shall be such that the free fall distance (see definition) shall not exceed 6 feet (1.9m).

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- Fall arrest equipment receiving an impact or shock load from a fall shall be removed from service, tagged “Do Not Use”. This type of incident should be investigated by the supervisor, also be reported to the Safety Office and be entered into SMIS. The equipment shall be returned to the manufacturer for inspection and repair. It shall be repaired only by a qualified person at an authorized facility, or shall be destroyed.
- The preventive maintenance and inspection program for PPE shall include determination of shelf and service lifetimes and the load limitations for the system to be used as per manufacturer’s recommendations.

2. Lanyards with Energy Absorber.

a. Lanyards and their associated energy absorbers shall be used in accordance with the following:

(1) Possible falls into a fall arrest system shall not exceed 6 feet (1.9 m) free fall, 9.5 feet (2.9 m) total fall distance, and 1,800 pounds (8kN) maximum force.

(2) Manufacturer's shock force data or test data should be incorporated into the total arrest system design (including anchorage).

(3) Energy absorbers that have shock force indicators should be used (when available

(4) Lanyards shall be equipped with self-locking snaphooks or carabineers. (5) Lanyards shall not be knotted. (6) Lanyards shall not be attached back onto themselves unless they are designed by the manufacturer to function in that capacity.

b. Lanyards and energy absorbers shall be inspected for the following:

(1) Partial activation of the energy-absorbing device.

(2) Cuts, tears, and chafing.

(3) Electrical burns.

(4) Physical and ultraviolet light deterioration.

(5) Wear on snap hooks.

(6) Operation of snap hooks.

(7) Chemical damage and/or deterioration.

c. Suspect lanyards and/or energy absorbing equipment shall be tagged “Do Not Use” before they are destroyed. Lanyards and energy absorbing devices shall be stored in a dry, dark, and protected environment.

3. Self-retracting Lanyard/Lifeline.

a. Self-retracting lanyards and lifelines are attached to an automatic rewinding reel that quickly arrests a fall and limits the shock load to the worker. Self-retracting lanyards and lifelines limit the freedom of movement up to the length of the lanyard or webbing.

b. Self-retracting lanyards and lifelines shall be used in accordance with the following

(1) Manufacturer's energy absorbing data or test data should be incorporated

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into the total arrest system design (including anchorage).

(2) Self-retracting lanyards that have shock force indicators should be used (when available).

(3) Self-retractable lanyards shall be equipped with self-locking snaphooks or carabineers.

(4) Self-retracting lifelines shall be permanently marked with the manufacturer's name, model number, rating, and date of manufacture.

c. Self-retracting lanyards and lifelines shall be inspected for the following:

(1) Partial activation of the energy-absorbing device.

(2) Snaphook keeper spring tension.

(3) Cuts, burns, extra holes, or fraying of material.

(4) Excessive side movement of the snaphook keeper.

(5) Chemical damage and/or deterioration.

d. Suspect or shock activated self-retracting lanyards and lifelines shall be tagged "Do Not Use" and returned to the manufacturer or other authorized repair service for repair. Periodic inspections shall be in accordance with the manufacturer's recommendations.

4. Safe Climb Devices.

a. Safe climb devices, which usually consist of a fixed rail, tube, or tensioned cable with slider, shall be maintained to permit the worker using the system to climb without continually having to hold, push, or pull any part of the system, leaving both hands free for climbing. The connection between the slider and the attachment point on a full body harness shall not exceed 9 inches (230 mm). These systems shall be activated within 2 feet (610 mm) after a fall occurs, in order to limit the descending velocity of the worker to 7 ft/sec (2.1 m/sec) or less. These systems are typically mounted on the face of a fixed ladder or the structure.

b. The climber shall ensure that the structure, system, and PPE are inspected prior to use to ensure proper operation and good working order. If a climbing system is found to be defective, the climber will use an approved alternative climbing and fall arrest method or elect not to climb.

D. Rescue Equipment

1. Controlled descent devices are used to make emergency descents from aerial devices or elevated positions on structures. Controlled descent devices shall be sized to include the maximum elevated position obtainable from the bucket, platform, or elevated position. The rate of descent may be controlled by the worker (or rescuer) or by a friction type brake.

a. These devices shall be attached to the full body harness such that the worker (or rescuer) will have control of the descent and be able to attach and detach him or herself. Supervisors shall ensure that necessary components to affect the attachment between the descent device and the climber's full body harness are stored with the descent device.

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b. Controlled descent devices shall be stored in a clean, dry, protected environment. They shall be cleaned and carefully inspected prior to and after each use.

c. Rope (handline/lifeline) rescue methods taught through AVISHKAR TECHNO SERVICES sponsored tower climbing and fall protection courses.

2. The rescue equipment shall be designed to work with the type of structure(s) or aerial devices that workers (or rescuer) may be required to use the equipment.

E. Personal Protective Equipment

1. A AVISHKAR TECHNO SERVICES hazard evaluation shall be completed and maintained current at each job site. Prior to the start of any work at the job site or work area, the AVISHKAR TECHNO SERVICES hazard evaluation shall be reviewed to determine what PPE and safety equipment are necessary, and if there are any new hazards at the site. PPE shall be worn as required in the hazard evaluation.

2. Tower climbers may consolidate the issues of safety and personal preference in selecting their choice of personal safety equipment best suited for the job.

3. Observers/visitors shall not enter the work area or drop zone unless authorized by the supervisor and will be equipped with personal protective equipment dictated by the hazards present.

4. The following list specifies safety equipment that is either required or recommended to be used while on the job site and for climbing towers:

a. Head Protection - All personnel shall wear hard hats or approved safety helmets on the job site whether they are on the ground or climbing the tower. Anyone within the drop zone (radius) of a communications tower construction project must wear a hardhat and exercise caution. When using hardhat liners, it is important the hard hat fits over the additional headgear. Hard hats or safety helmets will also be equipped with chinstraps and used.

b. Foot Protection - Steel toed, reinforced soled tower climbing boots or shoes are recommended for tower climbers. The specific climbing conditions such as tower structure and weather conditions will dictate to the climber what the best foot protection will be. Personal preference in selecting the most appropriate safety footwear shall prevail. Tennis and other soft- soled shoes shall not be used for tower climbing.

c. Hand Protection - Leather work gloves are recommended when climbing towers.

d. Eye Protection - Safety goggles or safety glasses shall be used whenever eye safety is at risk.

e. Ear Protection - Ear plugs should be used whenever ear safety is at risk.

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f. Clothing - Suitable work clothes shall be worn when climbing towers to offer protection from cuts and abrasion, weather conditions, and other tower structure hazards. Adequate work clothing should consist of coveralls, pants, and shirts made of material suitable for outdoor working conditions. Tower climbing with only short pants (shorts) and/or no shirt are prohibited. Clothing shall not be too loose or ragged and should be free from snag hazards such as loops and belts.

g. Communications Devices. AVISHKAR TECHNO SERVICES provided two-way, hands free, voice actuated radio head sets should be worn by the tower climber and ground safety person to provide reliable communications during the work, negating the need for hand signals.

h. Radio Frequency (RF) Personal Monitor. Climbers shall be trained on the use of, and will wear a calibrated RF level monitoring device when working around or on a tower which may have active transmitters or where the status of transmitters are unknown.

F. Personal Conduct. When tower climbing, always follow safe climbing practices and watch for any unsafe climbing practices by others at the job site. Unsafe climbing practices must be eliminated or corrected before accidents occur.

1. Unsafe climbing practices that are prohibited while working on towers are:
 - a. Climber shows fatigue.
 - b. Climbing through or past unprotected electrical conductors.
 - c. Not inspecting tower or PPE before climbing.
 - d. Attaching to a tower at an inadequate anchorage.
 - e. Not maintaining 100% attachment.
 - f. Throwing any material up or down while on tower.
 - g. Failure to maintain a 3-point contact with the tower.
 - h. Holding or attaching onto antenna lines, coax, conduits, etc. for support.
 - i. Climbing while under the influence of alcohol or drugs.
 - j. Climbing when ill or on medication that may negatively impact or impair good judgment or performance.

Anchorage, Aerial, and Fixed Climbing Devices

A. Anchorage

1. Anchors may be welded (closed) (i.e. eyebolts, rigging points, slings, or ropes, or other attachments designed into the structure).

2. Anchorages shall meet the minimum requirements of an engineered system for each worker attached. An engineered system shall be in compliance with the mandatory personal fall arrest systems in 29 CFR-1910.66 App C Personal Fall Arrest System (PFAS), and must meet the following basic criteria:

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- a. An anchorage of sufficient design to withstand a static load of 5,000 pounds or (22.2 kN) the maximum anticipated impact load times an overload capacity factor (OCF) of at least 2.0 for each worker.
- b. An additional OCF multiplier of 0.2 for each additional worker attached to the anchorage.
- c. Energy absorbing properties of the fall arrest system, when incorporated into the anchorage design will usually reduce the maximum forces imposed onto the anchorage.
- d. Refer to the above standard for more detailed criteria in anchoring the PFAS.

3. Anchorage Considerations.

a. General.

- (1) Additional static and dynamic loads shall not be attached to the same anchorage point as used for the PFAS.
- (2) The job supervisor, in concurrence with the qualified climber shall determine if the anchorage is to be used.
- (3) Anchorages shall be visually inspected at the time of attachment for loose or missing bolts, cracks, and bends. Damaged anchorages shall not be used and the tower will be red-tagged as "Damaged. Do Not Climb!" All damages will be documented and reported immediately to the tower owner.
- (4) Anchorages that have received a shock load shall be immediately inspected for damage.
- (5) Damage to anchorages shall be reported to the supervisor, the program coordinator, and noted on the RMW. The program coordinators will report all damages to the AVISHKAR TECHNO SERVICES Safety Management Department.
- (6) Damaged anchorages will be repaired and certified by the manufacturer or a structural engineer prior to use.

b. Specific.

- (1) Attachment around a lattice tower member supported by one bolt on each end may be permitted with the proper fall arrest equipment if multiple-bolted members are not available.
- (2) Preferred lattice anchorages are around multiple-bolted angle iron

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members or around and above joints where multiple members are connected.

(3) Attachment around and above all steel tower joints are permitted.

(4) Attachment around multiple bolted tower members is permitted.

(5) Attachment to slanted structure members should be avoided.

(6) A wire rope or padded lanyard shall be used around structural members that have potential for fraying and limits movement of the lanyard at the connection point.

B. Aerial Devices. Only qualified operators shall be permitted to operate an aerial device.

1. Qualified operators shall be certified through training and experience to operate the specific aerial device employed. Required training will be formal training or specific training which will include emergency procedures from the company where the aerial device is obtained. Refer to 29 CFR 1926.453

2. Bucket and platform anchorages shall meet minimum engineered loads while limiting potential free falls to 6 feet (1.9 m) for a full body harness. Aerial device anchorages shall receive an annual inspection and a visual inspection prior to use. Boom straps are the preferred anchorage. Walking surfaces shall have an anti-skid surface.

C. Fixed Ladders. Communications tower ladder climbing devices shall comply with 29 CFR 1910.27 (Fixed Ladders) and be kept in good repair. Devices determined to be hazardous shall be immediately removed from service, reported to the Safety Manager and Program Coordinator, and red-tagged as “Damaged. Do Not Climb!” Corrective measures shall be completed prior to the next climb.

Fall Protection Requirements for Elevated Work

A. General. This chapter defines the fall protection requirements for working at elevated levels (6 feet or higher) on communications towers and related structures. The design and type of structure determines the method of climbing, PPE to be used, and fall protection device required for climbing, transferring, resting, working, and rescuing.

B. Qualified Climber Classification

1. An employee may become certified as a “Qualified Climber” as defined in the AVISHKAR TECHNO SERVICES Tower Climbing and Fall Protection Program, after successfully satisfying physical fitness requirements and completing authorized or competent climber Training which meet the following standards:

- ANSI Z490.1 Adult training criteria in safety, health and environmental training
- ANSI A10.32 Fall protection for Construction

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- ANSI A10.48 Criteria for Safety Practices
- Z359.2 Standard Minimum requirements for comprehensive managed fall protection programs
- NATE CTS standards
- OSHA regulations including 2017 Walking-Working Surfaces

training courses and satisfying physical fitness requirements and has demonstrated proficiency in climbing.

a. All “Qualified Climbers” shall be trained in accordance with program requirements

b. All “Qualified Climbers” shall have passed a physical examination to ensure they are physically fit for the stresses of tower climbing and rescue.

c. All “Qualified Climbers” will provide documentation of required tower climbing training and climbing experience (i.e. copy of RMW) to the AVISHKAR TECHNO SERVICES Program Coordinator.

2. A “Qualified Climber’s” record will be reviewed annually for recertification as required.

3. Non- AVISHKAR TECHNO SERVICES sub tier employees and contractors must also be a “Qualified Climber” in accordance with this program.

4. AVISHKAR TECHNO SERVICES shall provide qualified climbers OSHA required equipment and PPE for the performance of their duties.

C. Common Requirements. Prior to any tower climbing work, a Risk Assessment (RA) must be completed for each job site. The RA shall include a pre-climb tower checklist and inspection report to accurately determine the overall tower condition, electrical or RF hazards, and what PPE is required. This assessment will be documented on the RMW.

1. Tower climbers shall not service radio antenna systems connected to live radio transmitter equipment per 29 CFR 1910.147 (Lock-out/Tag-out). All other transmitters should be deactivated per 1910.97 (Nonionizing Radiation) and 1910.268 (Telecommunications) to prevent injuries to tower climbers while climbing in the vicinity of other antenna systems.

2. During all climbing activities at least two (2) qualified climbers shall be present on the job site. One of these qualified climbers will have been a “Qualified Climber” for at least two years.

3. Workers shall be attached to an anchorage point at all times when working or resting at elevated locations (6 feet and above). Moving, relocating, transitioning, and transferring activities performed on the tower require 100% attachment to an anchorage point.

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4. Tower climbers shall check for a safe “Climber Fall Zone” area on the tower when positioning at the work position.

5. A personal RF monitor shall be worn when climbing structures that may have active transmitters in the area.

D. Climbing and Walking Surfaces. Climbing and walking surfaces on equipment, ladder rungs, etc., shall be furnished with nonskid surfaces where possible. Ladders with deteriorated nonskid surfaces shall be removed from service until repaired. The walking surfaces shall be kept free of clutter. Climbing and walking on cross arms (crossed tower members and diagonal bracing) in lieu of a ladder is not recommended. Climbing pathways should be clear of any obstructions.

E. Working from an Aerial Device. Prior to operation of the bucket or platform, workers shall be attached to an engineered anchorage on the aerial device by a full body harness in conjunction with a shock absorbing or retractable lanyard. Snaphooks shall be of the self- locking type. Working or standing on any rail of an aerial device shall not be permitted (All work will be performed from the floor of the platform).

F. Transferring Between an Aerial Device and a Structure. Transfers between an aerial device and a structure are discouraged. When transfers between a single or multiple occupancy aerial device and an aerial ladder, cable cart, or other equipment are required, they shall be in accordance with the following procedure:

1. Buckets and platforms shall be positioned to remain stable during a transfer. The platform or bucket shall have a fixed-pin or a locking mechanism to provide stability during transfer.

2. The transfer shall be made from the aerial device by a door, step, or secured ladder designed solely for the purpose of assisting the worker over the rim of the bucket or platform. Portable ladders shall not extend beyond the rim of the bucket. Portable ladders shall be removed from the bucket after the worker returns to the bucket. Platform guardrail systems must meet the design requirements per 29 CFR 1910.27, (Fixed Ladders).

3. The aerial device shall be attended at all times when employees are transferring from or to the aerial device. The aerial device shall be considered attended as long as a qualified operator remains at the controls either in the bucket or at ground level. The climber and the operator shall remain in voice and/or visual contact at all times when a climber is aloft. While a climber is working aloft and not transitioning to another area, the operator may work on other jobs at the site provided the operator is available when needed at the controls.

4. A climber transitioning between an aerial device and a structure shall be attached to the

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structure with both feet on the floor of the bucket or platform prior to making the transfer. The employee shall not be connected to the aerial device while attaching to the structure. The unattached time shall be kept to a minimum.

5. There shall be a second qualified climber present at the location when a transition is performed.

G. Communications Structure Requirements.

1. Inspections. The AVISHKAR TECHNO SERVICES Tower Climbing Program Coordinator and Safety Manager shall ensure that all structures subject to climbing shall be formally inspected per the current version of EIA/TIA-222. This inspection will be completed by a competent person (i.e. Tower Technologist, Professional Engineer, Safety Engineer, licensed structural engineer, or an industry certified tower inspector). Structures inspections shall consist of a detailed structural analysis per the current version of EIA/TIA-222 (for lattice towers and non-wood poles) and 29 CFR 1910.269 Appendix D (for wood poles). This will include an inspection of fall protection system on all types of structures to ensure compliance with 29 CFR 1926 SubPart M. All communications structures shall be inspected every five (5) years. This formal inspection does not replace the mandatory inspection before each climb.

a. Towers.

(1) Fixed Ladders. When provided, fixed ladders shall be used for ascending and descending communications structures, except where work assignments or conditions dictate otherwise. When safe climb devices are available and operational, they shall be used to ascend and descend a communications structure.

(2) Transitioning to the work position shall be accomplished while maintaining 100% attachment using a full body harness and lanyard or lifeline in conjunction with an energy- absorbing or self-retracting lanyard or lifeline.

(3) In situations where a safe climb device is not available or not operational and climbing has been determined necessary, qualified climbers will be allowed to climb while maintaining 100% attachment to a suitable anchorage point.

(4) One hundred percent attachment is not required while utilizing approved work platforms, having guardrails and kickboards in accordance with 29 CFR 1910.23 and 1910.24.

(5) Portable Straight or Extension Ladders. Portable straight or extension ladders shall be placed at an angle that will not permit slippage (minimum standard is the 4:1 ratio) of the ladder base when climbing. Unsecured ladders shall be supported by a ground worker until the climber has secured (tied) the ladder and transferred to the structure. (Reference 29 CFR 1910. 25 (Portable Wood Ladders) and/or 29 CFR 1910.26 (Portable Metal Ladders).

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b. Pole Structures. All pole communication structures that will be climbed shall be equipped with a safe climb device. If a safe climb device is not available, then a PFAS will be used. When climbing on step bolts, fixed ladders, or moving between work or rest positions, climbers shall maintain 100% attachment.

(1) Wood Pole Structures. Wood pole structures are not authorized for use as radio communications structures and will not be climbed. Where pole structures are still in use, an aerial device will be used to perform all work on the antenna system.

(2) Non-Wood Pole Structures. Concrete, fiberglass, and steel poles meeting the current version of EIA/TIA-222 are acceptable.

(3) Wood Pole Structures. Wood pole structures are not authorized for use as radio communications structures and will not be climbed. Where pole structures are still in use, an aerial device will be used to perform all work on the antenna system.

(4) Non-Wood Pole Structures. Concrete, fiberglass, and steel poles meeting the current version of EIA/TIA-222 are acceptable.

Pre-Climb and Rescue Procedures

A. General. An initial Risk Assessment will be completed on each structure. AAVISHKAR TECHNO SERVICES form shall be reviewed and updated by the work crew and signed by the on-site job supervisor prior to each structure climbing job assignment. If a RA does not exist, one will be completed, and the level of risks will be assigned in accordance with AVISHKAR TECHNO SERVICES Tower Climbing Program Coordinator. Approval (written or verbal) of the RA, including the RMW, by the appropriate authority must be given prior to climbing a structure. Based on the level of residual risk, the immediate supervisor may not have the authority to accept the risk for the operation. A vital step in the RA will be rescue procedures and equipment to be used in the event of an incident. This procedure will be documented on the RMW for that structure.

1. The rescue procedure shall provide prompt rescue of employees or a means of self-rescue (e.g. providing controlled descent device, radio, etc.). A site safety briefing shall be held at the beginning of each day, job, or change in work procedure to review the potential hazards involved in the work to be performed and potential rescue methods available. These discussions will help to ensure the availability of proper rescue equipment and to facilitate quick rescue of the worker.

2. Rescue of fall victims shall be included in all training and job planning. Aerial devices, cranes, handlines (lifelines), or other device capable of lifting the climber should be readily available.

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3. Manufacturer's recommendations and AVISHKAR TECHNO SERVICES requirements shall be followed for the inspection, use, and maintenance of all PPE and safety equipment.
4. Only PPE certified by the manufacturer to meet all OSHA standards and regulations is authorized for use. No personal owned or home-built, or agency-built equipment will be used in place of OSHA compliant PPE.
5. Safety and Health Precautions. Employees shall not be assigned to work in hazardous areas/activities except in pairs, and always with established communications. Tower climbing will only be performed by qualified climbers and in pairs.
6. AVISHKAR TECHNO SERVICES Check-Out-Check-In system requires maintaining a record containing the itinerary, name of employee, work area, estimated time of return and miscellaneous information such as other crew members, etc. In the event an employee does not return or contact the office at the prearranged time, search and rescue procedures shall be initiated. This will be the procedure for all tower climbers and telecommunications technicians.
7. Radio Station Deactivation's 29 CFR 1910.97 (Nonionizing Radiation) and 29 CFR 1910.268 (Telecommunications). As per OSHA Regulations 29 CFR 1910.97 (Nonionizing Radiation), climbers shall not be permitted to work on antenna systems connected to live radio transmitters nor be exposed to hazardous levels of electromagnetic radiation (radio frequency energy). Maintenance procedures require notification and coordination with the affected radio system dispatchers. Coordination with dispatchers shall include an estimated time for radio system reactivation on the structure being serviced. As work may need to be accomplished where nearby transmitters are active, a personal RF monitor should be worn to identify any hazardous levels of electromagnetic radiation.
8. Medical Services and First Aid, 29 CFR 1910.151. All employees whose work assignment in the field places them beyond reasonable access to a medical facility in terms of time and distance (15 minutes and/or 10 miles) must be adequately trained to render first aid. All climbers shall have a current certificate in first aid and CPR before accepting field assignments.
9. Medical Condition of the Climber. A climber that is ill and/or on medication which may inhibit actions or cause over stimulation, dizziness, drowsiness, etc., will not climb. Any observed adverse physical conditions of any team member should be reported to the onsite job supervisor. Any climber that exhibits an adverse physical condition that prevents them from functioning as a climber, shall not function as a ground safety person. This adverse physical condition will prevent them from performing a rescue.
10. Electrical Powerlines 29 CFR 1910.335 (Working Near Energized Equipment), AVISHKAR TECHNO SERVICES climbers who will work within 10 feet of electrical powerlines or service drop shall inform the utility company. They shall request the utility company to deenergize, move, cover, or barricade the exposed energized source.

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RF Energy Safety Program

A. Purpose:

The purpose of this program is to specify the maximum allowable levels of exposure to Radio Frequency (RF) fields with ranges between 10 MHz and 100 GHz. It further establishes guidelines for individual activities while working in the presence of RF Energy.

B. Maximum Exposure Limits:

Basic exposure levels are based upon the specific absorption rate, (SAR). This is defined as the rate at which the human body absorbs RF energy expressed per unit mass of the body. RF energy absorption can be through either direct induction of an electromagnetic field or through contact with energized metallic objects. The Occupational Safety and Health Administration (OSHA) in the standard on nonionizing radiation 29 CFR 1910.97 have determined maximum limits for both “partial body irradiation” and “whole body irradiation”. “Partial body irradiation” pertains to a portion of the body being exposed to incident electromagnetic energy, and “whole body irradiation” pertains to the whole body being exposed to incident electromagnetic energy. OSHA has determined that for both partial and whole body exposures relative to electromagnetic fields of 10 MHz through 100 GHz under normal environmental conditions, the maximum level to be: 10 mW/cm² (milliwatt per square centimeter) over a 0.1-hour period.

C. Exposure Monitoring:

An RF survey to determine potential employee exposures shall be performed on the site by a competent person. This survey should be done as frequently as possible to document areas of potential employee exposure. Any individual working on any site whose duties bring them within 10 feet of an antenna shall wear a personal monitoring device to determine potential exposure. If the maximum exposure level is approached, they are to leave the area immediately until a determination is made that they can work safely in the area.

D. General Requirements:

Every individual working on a site will have RF awareness training and understand the use of personal monitoring systems.

Only authorized individuals will be allowed on work sites.

Signage that meets the requirements of ANSI Z53.1-1953 as referenced in OSHA 29 CFR 1910.97 will be posted prominently at controlled environment sites.

Assume all antennas to be active and emitting RF energy. Only specially trained individuals shall install or repair any component parts. All locations will be fenced off to prevent the general public from potential RF exposures. Any protective devices such as shields must be installed prior to testing any new or repaired equipment that may emit RF energy.

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Additional metallic objects not necessary for the operation of the site should be removed to prevent inadvertent contact with energized metals.

E. Electro-explosive Devices:

Care shall be taken to ensure that electro-explosive devices are not placed in FR fields of a level sufficient to cause serious risks. Firing circuitry along with the wires of electric blasting caps may, under certain circumstances, pick up sufficient energy from RF fields to cause caps to explode. The susceptibility of the blasting caps to RF fields depends on the frequency, polarization and the strength of the field, and various factors in the design of the detonator – including to what extent it is electrically screened from radio interference. The level of field intensity that may prove hazardous depends on its frequency: the lower the frequency, the more susceptible are the detonators.

F. Safety Procedures for Operators and Maintenance Personnel of RF Devices (RF Workers):

1. Maintenance personnel and operators of RF devices shall be aware of the potential hazards of RF fields.
2. Particular care shall be taken to ensure that all people are clear of any direct beam of a RF device before it is switched on for test or maintenance purposes.
3. Instructions and procedures for repair, maintenance and operation of a device, as specified by the manufacturer or a competent person, shall be readily available to, and be followed by, operators and maintenance personnel.
4. Replacement components shall be equivalent to original components. Transmission lines, waveguides, gaskets, flanges and similar components shall have the same operating characteristics as the original components or be approved by the manufacturer of the original equipment, or a person trained in the safe use of this equipment.
5. Testing of a device either before or after completion of any repair work shall be carried out after protective shields, waveguides and other components have been replaced in their designated locations.
6. The correct operation of electronic test equipment and power meters shall be checked in advance, i.e., prior to using them at the repair station or test site.
7. Adjustment of voltages, replacement of RF energy generating components, dismantling components or refitting transmission lines shall be undertaken by persons specially trained for such assignments. The services of a qualified repairperson shall be sought when any malfunction is suspected.
8. The correct operation of all safety interlocks shall be tested and operators shall not defeat

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any safety interlock.

9. A RF generating component shall be tested with an appropriate load connected to its output or with the radiated energy absorbed by anechoic material. The energy generated shall not be allowed to radiate freely into occupied areas.

G. RF Surveys

RF Survey Procedures – The objective of a survey is to determine whether the device or installation complies with recommended standards of performance and personnel exposure, and to assess the effect of the location of the device with respect to controlled and uncontrolled areas in the environment. The following recommendations are made with respect to RF surveys:

1. Only competent and experienced persons shall carry out RF surveys
2. Before routine operations begin, a RF survey shall be conducted for all new installations capable of producing levels exceeding those specified.
3. A survey shall be made following any repairs, increases in radiated power or changes in working conditions, protective shielding and barriers that may increase the levels, to ensure that the levels do not exceed the limits specified. This refers both to RF and microwave exposed workers and the general public.
4. A survey shall be conducted when any malfunction that may increase the field levels induced body currents or contact currents is suspected.
5. A survey shall be conducted as frequently as practically possible around devices and at installations that are capable of producing fields, induced body currents or contact currents in excess of specified limits.
6. Survey instruments shall be selected to match the RF source & exposure conditions such as frequency, level of field strength or power density, near- or far- field. Survey instruments shall be fully calibrated at least once every three years. Their performance shall be checked against another calibrated instrument before carrying out a survey.
7. During a survey, a complete record of the field parameters (electric field strength, magnetic field strength or power density and induced body and contact currents) at each work site shall be kept to assist in making a realistic evaluation of compliance.
8. During the inspection of any RF device or installation, all safety interlocks and "ON-OFF" control switches shall be examined and placed in working order. The required warning signs, labels & tags must be readable and properly affixed to the device.

H. Records and Recommendations:

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(a) Records shall be kept of all RF survey measurements and their evaluation. The records shall include the date the measurements were made, number and type of devices in the area surveyed, the locations of measurement with respect to the RF emitting device, names and organization of who conducted the survey, survey results, as well as the model, serial number and calibration date of the measuring instrument(s) used. Other information that may prove useful would be photographs, floor plans, etc.

(b) Recommendations on appropriate changes in shielding, location and operation of the device, based on the evaluation of the survey measurements, shall be made to the person(s) responsible for the device. When a remedial action based on these recommendations has been taken, another survey shall be made to verify the effectiveness of the actions.

I. Warning Signs:

Recommended Warning Signs- There are three warning signs suggested for RF Field awareness. These signs or reasonable alternatives shall be used. The suggested signs are designed to indicate the nature and degree of hazard associated with a given device or location. The nature of the hazard is indicated by the symbol, and degree of hazard is indicated by the shape and color of the sign. The warning signs and their meaning should be posted as required. The size of the sign shall be appropriate to the conditions of use, such that it is clearly distinguishable, being either illuminated or employing reflective materials as necessary.

(Signage that meets the requirements of ANSI Z53.1-1953 as referenced in OSHA 29 CFR 1910.97 will be posted prominently at controlled environment sites.)

J. Definitions:

Antenna - A device for radiating or receiving radio frequency (RF) energy.

Antenna Gain - The increase in power transmitted or received by a directional antenna when compared to a standard antenna, which is usually an ideal isotropic antenna. Gain is a ratio of powers and may be expressed in decibels (dB) or as a pure number.

Auditory Effect - Human perception to individual pulses from RF fields in the form of audible clicks, chirping or buzzing sounds, depending on the pulsing regime and intensity of the field.

Cavity - The interior of a metal structure that encloses or confines a radio frequency field.

Computerized Tomography - A diagnostic-imaging procedure in which anatomical information is digitally reconstructed from x-radiation transmission data obtained by scanning an anatomical area from many directions.

Competent Person - An individual who because of his/her knowledge, training and experience is qualified to carry out RF and microwave surveys and/or repair and maintain RF and microwave devices.

Contact Current - Current flowing between an energized, isolated, conductive (metal) object and ground through an electrical circuit representing the equivalent impedance of the human body.

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Continuous Wave (CW) - Successive oscillations that are identical under steady state conditions (an unmodulated electromagnetic wave).

Denied Access Area - An area not to be accessed by any person.

Duty Factor - The ratio of the pulse duration to the pulse period (i.e., time lapse between the start of consecutive pulses) of a periodic pulse train. Mathematically, the duty factor is the product of the pulse duration multiplied by the pulse repetition frequency.

Effective Isotropically Radiated Power (EIRP) - This term applies to directional antennas. The power that would have to be transmitted by an isotropic antenna to produce the same power density at any given point along the directional antenna's axis. Mathematically, EIRP is the gain of a transmitting antenna multiplied by the net power delivered to the antenna from the connected transmitter.

Denied Access Area - An area not to be accessed by any person.

Effective Isotropically Radiated Power (EIRP) - This term applies to directional antennas. The power that would have to be transmitted by an isotropic antenna to produce the same power density at any given point along the directional antenna's axis.

Electric Field - The region surrounding an electric charge, in which the magnitude and direction of the force on a hypothetical test charge, is defined at any point.

Electrical Ground - The earth or a metal surface placed in contact with the earth, or connected to the earth with a conductor.

Electromagnetic Interference - Degradation of the performance of a device, a piece of equipment, or a system caused by an electromagnetic disturbance.

Electromagnetic Radiation - The propagation of time-varying electric and magnetic fields through space at the velocity of light.

Extremities - Limbs of the body, including upper arms and thighs.

Far-Field Zone - The space beyond an imaginary boundary around an antenna. The boundary marks the beginning where the angular field distribution is essentially independent of the distance from the antenna. In this zone, the field has a predominantly plane wave character.

Field Strength - The magnitude of the electric or magnetic field, normally a root-mean square value.

Frequency - The number of sinusoidal cycles made by electromagnetic waves in one second; usually expressed in units of hertz (Hz).

General Public - All persons not employed as RF and microwave exposed workers or those not working in controlled environments (areas). They include pregnant women, the aged, children, the chronically ill and disabled.

Induced Current - Current induced in a human body exposed to RF fields. **Interlock** - A component or set of components that, when actuated, prevents the generation of power from a RF and microwave source, such as the magnetron in a microwave oven or a RF transmitter.

Leakage Radiation - Any unintended or accidental radiation emitted by a device outside its external surface.

Magnetic Field - A region of space surrounding a moving charge (e.g., in a conductor) being defined at any point by the force that would be experienced by another hypothetical moving charge. A magnetic field exerts a force on charged particles only if they are in motion, and charged particles produce magnetic fields only when they are in motion.

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Magnetic Resonance Imaging - A technique for obtaining images of the internal anatomy based on the use of nuclear magnetic resonance (NMR) signals. The NMR method is based on partially aligning the nuclear spins by use of strong, static magnetic field, stimulating these spins with an RF field oscillating at the precession frequency of nuclear magnetic moments, and detecting the signal that is induced at this frequency.

Microwave - A radio wave that has a frequency of between 1 GHz and 300 GHz or a wavelength of between 30 cm and 1 mm.

Modulated Wave (radiation) - An electromagnetic wave that is modified by pulsing, or by varying its amplitude, frequency or phase. Such a wave is called, respectively, pulse-, amplitude-, frequency-, or phase-modulated.

Near-Field Zone - A volume of space generally close to an antenna or other radiating structure, in which the electric and magnetic fields do not have a substantially plane-wave character but vary considerably from point to point. The near-field zone is further subdivided into the reactive near-field region and the radiating near-field region.

Occupationally Exposed Persons - Workers who are exposed to RF fields and microwaves in the course of their regular employment.

Organ-averaged SAR for the eye - Specific Absorption Rate (SAR) averaged throughout the whole eyeball.

Owner - A person, organization or institution having title to, or, an administrative control over a given RF emitting device.

Plane Wave Character - Nature of the angular field distribution in the far-field region of a source antenna, in which the electric field vector is perpendicular to the magnetic field vector, and they are both perpendicular to the direction of propagation.

Power Density - The rate of flow of electromagnetic energy per unit surface area usually expressed in W/m^2 or mW/cm^2 or $\mu W/cm^2$.

Portable Transmitter - A mobile device that radiates electromagnetic waves for the purpose of communication, examples of which are cellular telephones and walkie-talkies.

Radio frequency - The frequency in the portion of the electromagnetic spectrum that is between 3 kHz and 300 GHz.

Radiation (electromagnetic) - The emission or transfer of energy through space in the form of electromagnetic waves.

Radiating Near-Field Region - The region between the reactive near-field and the far-field wherein the radiation field dominates the reactive field, but lacks substantial plane-wave character.

Reactive Near-Field Region - The region that is closest to an antenna or other radiating structure and contains most or nearly all of the stored energy.

Responsible User - A person who is authorized to operate an RF device properly and safely with respect to RF radiation.

Restricted Occupancy - An area where access is restricted to RF and microwave exposed workers for a prescribed time duration.

RF Device - A device which generates and/or utilizes RF energy.

RF Survey - An evaluation of the actual or potential RF field levels in any area, specifically in the vicinity of RF devices, and an evaluation of induced and contact currents.

RF Worker - An employee or a person (including a pregnant woman) who because of

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his/her knowledge, training and experience with RF devices is qualified to work with these devices properly and safely with respect to RF exposure.

RF and Microwave Exposed Workers - Persons who are exposed to RF fields and microwaves in the course of their daily work (e.g., those who may work near an RF device but may not be RF workers).

rms - Root mean square. Mathematically, it is the square root of the average of the square of the instantaneous field or current taken throughout one period.

Safety - The absence of detrimental health effects from RF exposures.

Safety Officer - A person who is appointed to ensure safety of working within an RF environment.

Safety Officer - A person who is appointed to ensure safety of working within an RF environment.

Specific Absorption Rate (SAR) - The rate of radio frequency energy absorbed in tissue per unit mass. Quantitatively, it is the time derivative (rate) of the incremental energy (dW) absorbed by an incremental mass (dm) contained in a volume element (dV) of given mass density

Transceiver - A combination of transmitter and receiver in a single housing, with some components being used by both parts.

Uncontrolled Area - Any area that is neither a Restricted Occupancy Area, nor a Denied

Visible Warning Indicator - A display such as flashing lights and signs to warn people of the fact that the power of an RF device is on.

Wavelength - The distance traveled by a propagating wave in one cycle of oscillation. X

Radiation - Electromagnetic radiation having a wavelength in the range of 0.0001 to less than 1 nm.

Training and Qualifications

A. General. The training and qualification of employees for tower climbing consists of a sixpart program. The program is based on employees becoming certified to hold a “Qualified Climber” classification as defined in the Qualified climberssectop will be trained in accordance with this policy.

B. Policy. Climbers will be tested for knowledge and understanding of AVISHKAR TECHNO SERVICES Tower Climbing policy and competency with the Telecommunications Tower Climbing and Fall Protection Program. Each student will be provided a copy of this program.

C. Tower Climbing and Fall Protection Course. Climbers will be trained in the principles of; fall protection, use and care of a full body harness, safety climbing devices, tower climbing, transferring between equipment and structures, and rescue techniques. Climbers will also be trained in recognizing emergencies and how to select and use the appropriate rescue equipment and the proper technique for the situation.

1. Workers shall be trained in the selection and use of PPE, fall protection and rescue equipment and their application limits, proper anchoring, tie-off techniques, proper rigging practices, determination of elongation and deceleration distance, methods of use, and inspection and storage of the system. Methods to identify energized powerlines, apparatus, other auxiliary

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equipment on the tower, and to be knowledgeable of the rules applicable to work on and around the structure near energized power lines. Workers shall become familiar with manufacturer's recommendations, reduction in strength caused by certain tie-offs, and the maximum allowed free fall distance and total fall distance.

2. Due to the variety of required climbing techniques and associated hazards in tower work, it is essential that each respective climber be given sufficient training to master the required skills. The worker must possess the basic physical fitness required to perform the work. The worker shall demonstrate, to a trainer, proficiency in climbing functions and shall understand the hazards associated with each function.

3. Climbing instruction shall be presented, in such a way so the worker can recognize and avoid dangerous conditions while at the same time mastering the rigors of climbing, resting, and positioning for work on various structures.

4. Each piece of equipment used for climbing and work position attachment shall be explained and demonstrated. The worker shall become proficient in the use and care of the equipment to avoid abuse or use beyond its predetermined life. Workers shall be made aware of all the aspects on the equipment and materials they are working with regarding the stresses and resultant effects on safety margins while climbing or working aloft.

5. Required training shall be by classroom and actual field demonstration of the classroom instruction. An industry qualified instructor will conduct all classroom, actual field demonstration, and testing for NTC sponsored courses.

6. NTC Sponsored Tower and Fall Protection Courses must be approved by the National Telecommunications Manager and performed under the supervision of a AVISHKAR TECHNO SERVICES qualified climber or AVISHKAR TECHNO SERVICES approved training facilitator.

D. Emergency Care Courses. Qualified climbers will have a current First Aid and CPR certificate. This certificate will be obtained prior to any NTC sponsored training. AVISHKAR TECHNO SERVICES will provide annual First Aid and CPR training to meet this qualification.

E. Medical Qualification. Prior to attending training, climbers will pass the medical standards examination outlined and described in AVISHKAR TECHNO SERVICES 's Departmental Occupational Medicine Program. This examination describes the physical requirements needed to fulfill the Qualified Climber Classification. The completed examination will be retained in the employee official medical folder.

F. AVISHKAR TECHNO SERVICES Risk Management Process. This will include completion of a Risk Management Course that trains employees to recognize unsafe climbing conditions and defective safety climbing/arrest equipment. This course will train employees how to complete a Risk Matrix and a RMW.

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G. Documentation. Documentation shall 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 and Fall Protection Program requirements in this program. Demonstrated proficiency shall be included in the documentation. Documentation shall be made when the employee successfully completes the training. The documentation shall be retained and maintained in the appropriate file by the Program Coordinator and forward a courtesy copy to the State/Center Safety Manager. Training records will be maintained for the duration of the worker's employment.

Recertification

A. General. A "Qualified Climber" must maintain proficiency in climbing by demonstration and also must receive periodic training as new CPR/First-Aid, safety equipment, climbing procedures and techniques are continuously developed. The recertification involves an annual review, by the Program Coordinator, of the climber's record to determine when a climb was last performed, when the climber had last attended a AVISHKAR TECHNO SERVICES approved tower climbing class, when the last medical qualification was completed, and when the last CPR/First-Aid class was attended.

B. Recertification Requirements. If the qualified climber has climbed at least twice in the past year, has a current medical qualification, per AVISHKAR TECHNO SERVICES Departmental Occupational Medicine Program, and has been to a AVISHKAR TECHNO SERVICES sponsored tower climbing course within the past three years, then the climber may be recertified by an entry in his or her climbing record, made by the Program Coordinator, stating the climber is re-certified.

C. Certification Deficiency Corrections. Those qualified climbers that have not climbed at least twice in the past year, and/or have not met the current medical qualification and/or have not attended AVISHKAR TECHNO SERVICES sponsored training course in the past three (3) years and/or do not have a current CPR/First Aid certificate are not qualified to climb until the deficiencies are corrected.

1. If a climber is deficient in the medical qualification and meets all other requirements then he or she can be recertified after completing a medical examination by a medical officer and an entry is made in their climbing record.

2. If a climber is deficient in the number of climbs in the past year and/or has not been to an approved AVISHKAR TECHNO SERVICES climbing course in the past three (3) years, then the climber must attend an approved AVISHKAR TECHNO SERVICES climbing course to be recertified and an entry is made in their climbing record.

D. Documentation. All climbing training certificates and recertification statements concerning a climber shall be maintained for the duration of the worker's employment. The records must be kept by the Program Coordinator with a courtesy copy sent to the Safety Manager.

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Glossary of Terms

Aerial device. Any piece of equipment utilizing a bucket or platform to place the worker(s) at an elevated work position.

Anchorage. An OSHA required means of attachment to which the fall protection system is connected.

Attachment. A device such as a tie, band, or fastening that joins one thing to another.

Body belt. A belt that consists of a belt strap and D-rings, and may include a cushion section or a tool saddle. *Note: As of January 1, 1998, the body belt is no longer permitted as a fall protection device.*

Carabineer. A connector component generally comprised of a trapezoidal or oval shaped body with a normally closed gate or similar arrangement that may be opened to permit the body to receive an object, and when released, automatically closes to retain the object.

There are generally three types:

a) The self-locking type (required by AVISHKAR TECHNO SERVICES) with a self-closing, self-locking gate which remains closed and locked until intentionally unlocked and opened for connection or disconnection; or

b) The non-locking type (not permitted by AVISHKAR TECHNO SERVICES) with a self-closing gate which remains closed, but not locked, until intentionally opened by the user for connection or disconnection; or

c) The manual locking type (not permitted by AVISHKAR TECHNO SERVICES) with a self-closing gate which remains closed but not locked (unless purposely locked by the user) until intentionally opened by the user for connection or disconnection.

Certification. State of being certified and holding a license or certificate which assures that a climber has successfully completed the required AVISHKAR TECHNO SERVICES approved training or refresher courses.

Climber Fall Zone. The area 9.5 feet below the anchorage point into which a climber would fall if he/she fell from the structure.

Climbing. The vertical (ascending and descending) and horizontal movement to access the elevated work position. See Transferring and Transitioning. A climber must be mechanically attached during all climbing, work, or rest activities.

Competent person. One who, because of training, experience, and authority, is capable of identifying and correcting hazardous or dangerous conditions in the personal fall arrest system or any component thereof under consideration, as well as its application and use with related equipment.

Deceleration device. Any mechanism which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration distance. The additional vertical distance a falling worker travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of a full body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the worker comes to a full stop 3.5 feet (1.1 m maximum).

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Drop zone. The area around a tower/structure in which items will likely land if dropped from overhead. This zone is defined as .5 feet out from the structure base for every foot in elevation above the base of the structure.

Energy (shock) absorber. A component whose primary function is to dissipate energy and limit deceleration forces on the body during fall arrest. Such devices may employ various principles such as deformation, friction, tearing of materials or breaking of stitches to accomplish energy absorption. An energy absorber causes an increase in the deceleration distance.

Engineered anchorage. A fall protection anchorage point which is designed and will operate to withstand the maximum expected impact load while maintaining a specified overload capacity factor (OCF) of two.

Engineered system. A fall protection system that is designed to absorb the energy of a worker(s) during a fall while accommodating the static loads of tools and hardware. See Fall Protection System.

Fall arrest system. The assembly of equipment such as a full body harness in conjunction with a deceleration device and anchorage to limit the forces a worker experiences during a fall from one elevation to another.

Fall prevention system. A system intended to prevent a worker from falling from one elevation to another. Such systems include positioning device systems, guardrail, barriers, and restraint systems. Fall prevention systems are used in an attempt to prevent workers from falling from an elevation. It should be noted that these devices do not absolutely prevent a worker from falling; their function is to keep the worker at the same elevation.

Free fall distance. The vertical displacement of a fall arrest attachment point on the climber's full body harness 6 feet (1.9 m maximum) between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, lifeline, and lanyards elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Full body harness. A component with a design of straps which is fastened about the worker in a manner so as to contain the torso and distribute the fall arrest forces over at least the upper thighs or buttocks, pelvis, chest, and shoulders with means for attaching it to other components or subsystems. NOTE: Wherever the word "harness" is used by itself in this program, it refers to full body harness unless otherwise specified.

Hazard. Anything that can potentially endanger personnel, impedes safe working conditions, and conceivably causes injury, or loss of life.

Job site. The assembly point at the structure or equipment where the workers, tools, and vehicles are assembled to perform the climbing to the work position.

Lanyard. A flexible line of rope, wire rope, or strap that generally has a connector at each end for connecting the body or body harness to a deceleration device, lifeline, or anchorage.

Overload Capacity Factor (OCF). The number by which a maximum load is multiplied to assure that the system does not fail when loaded to the design load.

Pole Climbers/Gaffs. Devices that are used by tower workers for ascending, descending, and maintaining a work position on wood poles when no other means of support is available. Pole climbers or gaffs are secured to the tower worker's legs by foot and leg straps and are driven into the wood pole surface to provide support for the tower worker.

Pole strap. See Positioning strap.

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Portable ladders. Portable ladders are those that are not permanently installed to a structure but are the normal means of accessing the facilities on the structure as well as the structure itself.

Positioning strap. A strap with snaphook(s) to connect to the D-rings of a climber's full body harness. Used as a positioning device (also known as pole strap or safety strap).

Qualified climber. A worker who has been certified through AVISHKAR TECHNO SERVICES NTC sponsored approved training, satisfies medical qualifications, has a current CPR/First Aid certificate and proficient in the RA process, understands the methods, and has routinely demonstrated proficiency in climbing.

Risk Management Worksheet (RMW) A planning tool to identify and manage risks associated with any AVISHKAR TECHNO SERVICES operation. The five-step process includes: (1) identify the hazards; (2) assess the level of risk; (3) develop controls that will eliminate and or minimize the hazards; (4) implement controls; and (5) supervise and evaluate the control measures to see if they were effective.

Roll-out. A movement process by which a snaphook or carabineer accidentally disengages from an anchorage or object to which it is coupled.

Safety strap. See Positioning strap.

Self-retracting lanyard/lifeline. A device that contains a drum-wound web lanyard or steel line that may be slowly extracted from or retracted onto the drum under slight tension during normal movement of the user. The line has means for attachment to the fall arrest attachment on the body support. After onset of a fall, the device automatically locks the drum and arrests the fall. The device may have integral means for energy absorption.

Snaphook. A connector comprised of a hook-shaped member with a normally closed keeper or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are to be the self-locking type with a self-closing, self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection (two distinct operations are required to open a locking type snaphook). Non-locking and manual locking snaphooks are prohibited.

Total fall distance. The maximum vertical distance between the person's position before a fall and after the fall is arrested. The total fall distance includes maximum free fall distance plus maximum deceleration distance. Total fall distance excludes dynamic elongation.

Transferring. The act of moving from one distinct object to another (e.g., between an aerial device and a structure).

Transitioning. The act of moving from one location to another on equipment or a structure while going around or over an obstruction.

Work position. The elevated location on the structure or equipment where the worker is in position to perform the assigned work or task.

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Appendix 1

Physical Examination Guidance For Tower Climbers

This applies to all AVISHKAR TECHNO SERVICES personnel whose duties require climbing and working at elevated locations on radio communication towers and structures. It is intended to prevent injuries due to inadequate physical fitness or work capacity, since unfit persons can quickly become a hazard to themselves and their co-workers.

AVISHKAR TECHNO SERVICES Tower Climbing and Fall Protection program affirms that an employee may be classified as a “Qualified Climber” after successfully completing an approved training course and satisfying physical fitness requirements. Health screening and physical examinations in accordance with this program and the Occupational Medicine Program will be administered to all climbers as part of their certification program.

Medical examinations, including an exercise electrocardiogram when required, will be performed by an approved physician coordinated through the AVISHKAR TECHNO SERVICES Personnel Office. The examinations will be based on the criteria described Occupational Medicine Program.

Telecommunications Technician Position Description:

A AVISHKAR TECHNO SERVICES telecommunications technician is responsible for installing and maintaining a variety of radio communications equipment. This includes VHF and UHF Base Stations, mobile radios, microwave radio equipment, radio towers, antenna systems, and telephone equipment. Periodically, the technician may have to climb radio towers or structures of varying heights ranging from 30 to 200 feet to perform maintenance on towers and antenna systems.

Environmental Factors Which May Impact Performance of this Job Include:

Temperature extremes (particularly for outside work): Hot in summer; cold in winter, particularly in northern areas/districts and those with high elevations. Altitude: Work above 10,000 feet involves stresses of high elevation. Work between 6,000- and 10,000-foot elevation may involve high altitude stress if employees are not acclimated to it. Chemical Exposures: Employees may be exposed to chemicals during cleaning of equipment and servicing batteries. They may also be exposed to solder and soldering fluxes. Outdoors they may be exposed to poison ivy, sumac, etc.

Non-ionizing radiation: Employees may be exposed to microwaves.

Electrical: Employees may be working around high-energy power lines.

Dust: Possible exposure to windborne dust in outdoor environments.

Noise: High noise levels from operation of equipment, including snowmobiles and ATV's.

Travel in Isolated Areas: Medical care not readily available.

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Medical Examination Requirements

Medical examinations are required only when work conditions warrant them, and only after careful study and evaluation of those conditions. Medical standards, physical requirements, and medical evaluation programs will be established in accordance with the authority delegated to agencies in 5 CFR 339, or have AVISHKAR TECHNO SERVICES approval. They will be documented through job analysis as directly related to the requirements of the positions and documented in accordance with regulatory requirements.

Fitness for duty examinations is not to be used to replace the individual's personal, periodic medical examination. They are solely to focus on occupational fitness for duty. When a pre-existing condition is detected in the course of an examination, the individual is to be referred to his/her private physician for further evaluation, treatment, and follow-up. The employee is responsible for these additional costs. An agency can designate an examining physician or other appropriate practitioner but must offer the individual the opportunity to submit medical documentation from his or her personal physician or practitioner.

Schedule of Exams:

1. New employee: Baseline and whenever there is a direct question about an employee's continued capacity to meet the physical or medical requirements of a position, or as recommend by the examining physician.
2. Age 34 and younger: Every four years
3. Ages 35 to 44 years: Every two years
4. Age 45 and older: Annually

Medical Certification Procedure:

1. AVISHKAR TECHNO SERVICES Offices will coordinate the medical exams with local physicians.
2. If a AVISHKAR TECHNO SERVICES Office is anticipating the hire of a new employee or a reassignment, it is recommended that a pre-selection physical be performed at government expense. This will ensure the employee is physically fit to perform the job.
3. Upon completion of a physical examination and the examining physician's summary recommendation stating the employee can/cannot perform the job, or if there are any restrictions on performing that job, supervisors will determine if the employee will be allowed to climb towers.
4. This guidance is not to be used as grounds for dismissal if an individual, previously certified, fails the scheduled physical exam.
5. Maintain the results of the physical IAW 29 CFR 1910.1020 (Access to Employee Exposure and Medical Records).