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Telecommunications Tower Climbing and Fall Protection Policy

As part of Middle Tennessee Two-way's (MT2W) mandated safe tower climbing program, the Telecommunications Tower Climbing and Fall Protection Policy is now complete and stated in this document. This policy in conjunction with MT2W's Safety and Health Plan forms the basis of the tower-climbing program. The tower climbing policy sets the standards for the program and is to be considered official MT2W policy.

Telecommunications
Tower Climbing and Fall
Protection Policy
January 1, 2001

Preface

This document was designed from one issued by the United States Department of the Interior, Bureau and was modeled after the United States Department of Energy's, Western Area Power Administration (WAPA) Fall Protection March 1996 - Power System Communication and Control. It is intended to provide specific guidelines, instructions, procedures, and criteria for establishing and maintaining a fall protection policy and program for communications tower climbing and maintenance performed by MT2W employees and contractors. Procedures and guidelines are in accordance with MT2W's Health and Safety Policy document. Rules in this document apply to any work performed six feet or more above the next horizontal level, regardless of the structure being climbed.

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1. General

1.1 Introduction. Middle Tennessee Two-way Incorporated (MT2W) 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 an effective risk reduction Tower Climbing and Fall Protection Program. All MT2W employees who climb or perform work on communications towers must adhere to this policy. All communication towers that require climbing by MT2W employees shall be in compliance with this policy and shall meet the MT2W and OSHA standards for fall protection.

Communications towers should be designed to eliminate or minimize the need for climbing. Outside contractors, when used, will meet MT2W's safety requirements for communications tower climbing. Contractors will use only qualified climbers and shall follow all state and local government, Federal laws, and MT2W policy for tower climbing and fall protection. The elements of the Tower Climbing and Fall Protection Program (see Appendix A) and the definitions used in this chapter were taken from national standards and OSHA regulations to ensure uniformity of language.

1.2 Scope. This policy provides direction for a Tower Climbing and Fall Protection Program using both fall prevention and fall arrest equipment for communications towers and structures. These directions are based on recommendations from safety and telecommunications managers, field radio technicians, and others experienced in the field of tower construction and climbing. Sound engineering principles, safety considerations, applicable national standards and regulations, research into the tools, methods, practices, and available training form the basis of this policy.

1.3 Purpose. The purpose of this policy is to present sufficient details of proven present day methods, equipment, and training requirements necessary to provide safe and adequate procedures for workers climbing, moving, resting, and working at elevated work sites.

2. Interpretations and Definitions

2.1 Interpretations.

“May” - Permissive Choice (“may” equals “is permitted”).

“Must” or “Shall” - Mandatory under normal conditions (“must” or “shall” equals “is required to”).

“Should” - Advisory. “Should” statements represent the best advice available at the time of printing (“should” equals “is recommended that”).

“Will” - Mandatory, but allowing the responsible employee or party some discretion as to when, where, and how.

2.2 Definitions.

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

Anchorage. A secure means of attachment to which the fall protection system is connected. Anchorages must be constructed to withstand a 5000 pound load.

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

Body Belt. A belt, which 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 will no longer be permitted as a fall protection device but may be used in conjunction with PFAS as a positioning device.

Carabiner. 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.

Carabiners are generally one of three types, namely:

- A) The self locking type (required by MT2W for human safety connections) with a self-closing, self-locking gate which remains closed and locked until intentionally unlocked and opened for connection or disconnection. These are sometimes called Auto-locking carabiners (‘biners).
- B) The non-locking type (prohibited for human fall protection and work positioning) with a self-closing gate which remains closed, but not locked, until intentionally opened by the user for connection or disconnection; or
- C) The locking type (prohibited for human fall protection and work positioning) 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 that assures that a climber has successfully completed the required MT2W approved training courses.

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.

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 (1.1 m (3.5 feet) maximum).

Drop zone. The area or space on a tower directly under a worker into which he would fall before the fall arrest system stops his fall.

Detachable ladders. Detachable 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.

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 that 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 assemblage 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.

Fall protection system (hardware). Consists of either a fall prevention system or a fall arrest system. The system must have three integral parts: an anchorage, a climber's body attachment device, and a means of connecting the body attachment device to the anchorage.

Free fall distance. The vertical displacement of a fall arrest attachment point on the climber's full body harness (1.9 m (6 feet) 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 chapter, it refers to full body harness unless otherwise specified.

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

Job Hazard Analysis (JHA). A study of a specific task or work assignment to (1) identify each step involved with a particular task, (2) identify the known or potential hazards associated with each step, (3) develop solutions that will eliminate, minimize, or control the hazards, and (4) identify all residual risks (See Appendix C).

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.

Near Miss Accident. An accident or incident that does not result in injury to personnel.

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 are 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.

Positioning strap. A strap with snap hook(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 MT2W approved training, satisfies physical fitness requirements, understands the methods, and has routinely demonstrated proficiency in climbing. A qualified climber will have an in depth knowledge of the hazards and equipment associated with climbing. The worker's climbing knowledge and ability shall be confirmed by a trainer in concurrence with the supervisor.

A qualified climber who has not climbed for a period of one (1) year will be required to be re-certified to maintain his/her "Qualified Climber" classification. All other qualified climbers who climb at least once a year will be required to be re-certified on a periodic three (3) year cycle to maintain their "Qualified Climber" classification.

Note: A qualified climber is not required to be a telecommunications technician, and may be an employee that performs other functions that require climbing structures.

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

Safety strap. See Positioning strap.

Self-Retracting Lanyard/Lifeline (SRL). 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.

Snap hook. A connector comprised of a hook-shaped member with a normally closed keeper (gate) or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snap hooks are to be the 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 snap hook). Non-locking snap hooks are prohibited. These may also be known as Auto-locking snap hooks.

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.

Tower Climbing and Fall Protection Program. A program intended to prevent falls and injuries to workers due to accidents when ascending, descending, and working at elevations.

Trainer. An individual who has been certified through MT2W approved training in a “Train the Trainer” program for certifying climbers and teaching tower climbing and fall protection to employees.

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.

Written work procedure. A set of specific instructions outlining the course of action for performing tasks in a safe and timely manner, as identified in the Job Hazard Analysis (JHA).

3. Responsibilities

3.1 The MT2W Safety Director shall establish an effective tower climbing and fall protection program in accordance with OSHA and the guidelines given in this policy. The MT2W Safety Director shall take steps to assure the guidelines contained in this policy are adopted for all climbing and elevated location work activities.

3.2 Tower Climbing and Fall Protection Program Coordinators. Program Coordinators shall:

- A) Ensure that the established Tower Climbing and Fall Protection Program is carried out in an effective manner.
- B) 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.
- C) Participate in the refinement and implementation of a company wide Tower Climbing and Fall Protection Program.

3.3 Job Supervisor. The job supervisor, as identified on the job site, in concurrence with the crew, shall specify the fall protection system to be used before engaging in the work activity. The job supervisor shall assure the JHA safety requirements and pertinent work procedures are clearly defined and well understood by the work crew. If during the work activity, any member of the work crew addresses a safety concern, the job supervisor shall stop all work and resolve the issue. 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. Job supervisors shall require that all climbing and fall protection equipment be inspected prior to each use.

3.4 Work Crew. Each member of a work crew has 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 review of the work procedure plan or Job Hazard Analysis (JHA) 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.

3.5 Safety Managers (position optional at pleasure of the Safety Director). The Safety Manager should assist in the development and establishment of the MT2W 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 policy. The Safety Manager should assist personnel in arranging for training and in the purchase of fall protection equipment.

4. Personal Protective Equipment

4.1 General. This section 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 eliminate potential fall accident injuries.

- A) Personal protective equipment is to be stored in a dry, dark, secure area and protected from cuts, abrasions, and chemicals when not in use.
- B) Mandatory inspection of equipment before each use will serve to minimize accidents resulting from deterioration of equipment. All fall protection equipment shall be periodically inspected on at least an annual basis and the program coordinator shall maintain a documented record of the inspection.
- C) 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, and reported to the program coordinator. If defective equipment is determined to be non-repairable, it shall be disposed of immediately.

4.2 Fall Prevention/Positioning Equipment.

4.2.1 Full Body Harness. A full body harness, as defined in OSHA 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.

Full body harnesses used by MT2W 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 610 mm (2 feet) 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 normally be the connection point for a 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:

- a) Cuts, tears, and chafing.
- b) Electrical burns.
- c) Physical deterioration.
- d) Ultraviolet deterioration.
- e) Wear on connection devices.
- f) Evidence of shock loading.
- g) Chemical damage and/or deterioration.

Suspect body harnesses shall be destroyed. Body harnesses shall be stored in a dry, dark, and protected environment.

4.2.2 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.

- a) Snap hook gates shall face outward away from the worker's body. As of January 1, 1998, the use of nonlocking snap hooks as part of a personal fall arrest system and/or positioning device is prohibited. Multiple snap hooks of the locking type and/or approved carabiners may be attached to a single D-ring.
- b) Tools, handlines, or other objects that may interfere with the snap hook and cause roll-out shall not be attached to or hung from the positioning strap.
- c) Positioning straps and rope lanyards shall be inspected for the following:
 - 1) Snap hook keeper spring tension.
 - 2) Exposure of colored wear-warning inner layer.
 - 3) Elongation of holes in positioning strap material.
 - 4) Cuts, burns, extra holes, or fraying of material.
 - 5) Loose or worn rivets.
 - 6) Cracks, burns, or corrosion in the snap hook.
 - 7) Excessive side movement of the snap hook keeper.

8) Chemical damage and/or deterioration.

4.2.3 Pole Climbers/Gaffs. Pole climbers may not be used if the gaffs are less than 32 mm (1-1/4 inches) 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:

- a) Fractured or cracked gaffs or leg irons.
- b) Wear on stirrup and leg irons.
- c) Loose or dull gaffs.
- d) Proper sharpening of gaffs.
- e) Broken straps or buckles.

If any of these conditions exist, the defect shall be corrected before the 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. ASTM F887-91a provides detailed information for care of pole climbers.

4.3 Fall Arrest Equipment. All fall arrest equipment shall have locking-type snap hooks or approved carabiners, which meet or exceed applicable OSHA and ANSI requirements. Fall arrest equipment shall be used as a component of the system. 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.

- A) Fall arrest equipment should be attached to an engineered anchorage above the worker's waist. Regardless of the attachment height, the length of the body attachment shall be such that the free fall distance (see definition) shall not exceed 1.9 m (6 feet).
- B) Fall arrest equipment receiving an impact or shock load from a fall shall be removed from service, tagged "Do Not Use", and reported to the program coordinator. This type of incident is considered a "Near Miss Accident" and should also be reported to the Safety Office. 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.
- C) 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.

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

- a) Possible falls into a fall arrest system shall not exceed 1.9 m (6 feet) free fall, 2.9 m (9.5 feet) total fall distance, and 8 kN (1800 pounds) maximum force.
- b) Manufacturer's shock force data or test data should be incorporated into the total arrest system design (including anchorage).
- c) Energy absorbers that have shock force indicators should be used (when available).

- d) Lanyards shall be equipped with locking snap hooks or carabiners.
- e) Lanyards shall not be knotted.
- f) Lanyards shall not be attached back onto themselves unless a carabiner is used.

Lanyards and energy absorbers shall be inspected for the following:

- a) Partial activation of the energy-absorbing device.
- b) Cuts, tears, and chafing.
- c) Electrical burns.
- d) Physical and ultraviolet light deterioration.
- e) Wear on snap hooks.
- f) Operation of snap hooks.
- g) Chemical damage and/or deterioration.

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

- 4.3.2 Self-retracting Lanyard/Lifeline. 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.

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

- a) Manufacturer’s energy absorbing data or test data should be incorporated into the total arrest system design (including anchorage).
- b) Self-retracting lanyards that have shock force indicators should be used (when available).
- c) Self-retractable lanyards shall be equipped with locking snap hooks or carabiners.
- d) Self-retracting lifelines shall be permanently marked with the manufacturer’s name , model number, rating, and date of manufacture.

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

- a) Partial activation of the energy-absorbing device.
- b) Snap hook keeper spring tension.
- c) Cuts, burns, extra holes, or fraying of material.
- d) Excessive side movement of the snap hook keeper.
- e) Chemical damage and/or deterioration.

Suspect or shock activated self-retracting lanyards and lifelines shall be tagged “Do Not Use”, reported to the program coordinator, and returned to the manufacturer or other authorized repair service for repair. Periodic inspections shall be in accordance with the manufacturer’s recommendations.

- 4.3.3 Fixed Ladder Safety Climbing System. Fixed ladder safety climbing 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 230 mm (9 inches). These systems shall be activated within 610 mm (2 feet) after a fall occurs, in order to limit the descending velocity of the worker to 2.1 m/sec (7 ft/sec) or less. These systems are typically mounted on the face of a fixed ladder on the structure.

The climber shall insure that the structure, system, and personal protective equipment (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.

4.4 Rescue Equipment. 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.

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 himself 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. 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.

Rope (hand line/lifeline) rescue methods taught at MT2W approved tower climbing and fall protection courses are acceptable.

4.5 Personal Safety Equipment. A Job Hazard Analysis (see Appendix C) 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 Job Hazard Analysis (JHA) shall be reviewed to determine what personal protective equipment and safety equipment are necessary, and if there are any new hazards at the site. Personal protective equipment shall be worn as required. Personal safety equipment includes head protection, foot protection, eye protection, ear protection, and other equipment such as gloves and coveralls. Tower climbers may consolidate the issues of safety and personal preference in selecting their choice of personal safety equipment best suited for the job.

Note: Observers shall not enter the work area unless authorized by the work area supervisor and will be equipped with personal protective equipment dictated by the hazards present.

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 guy wire distance (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.

- 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. The most suitable type of footwear for ground workers may be considerably different than what the climber requires. 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 should be used whenever eye safety is at risk.
- E. Ear Protection - Ear plugs should be used whenever ear safety is at risk.
- F. Clothing - Suitable work clothes should 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. Clothing should not be too loose or ragged and should be free from snag hazards such as loops and belts.
- G. Communications Devices - The tower climber should use radios to communicate with key ground persons to provide reliable communications during the work, negating the need for hand signals.
- H. Appropriate signage indicating the presence of hazards shall be used. Appropriate signage may include, but not be limited to, “Hard Hats Required”, construction safety tape and traffic barriers.

4.6 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. Typical unsafe climbing practices that are prohibited while working on towers are:

- A. Climbing or descending too fast.
- B. Climbing too close to material hoisting ropes and hand lines.
- C. Fatigue.
- D. Climbing through or past unprotected electrical conductors.
- E. Using too long steps in climbing or descending.
- F. Not inspecting tower before climbing.
- G. Inattention while ascending or descending.
- H. Belting off to a tower at wrong position.
- I. Physically unfit for climbing.
- J. Horseplay.
- K. Left blank intentionally.
- L. Failure to get a good handhold.
- M. Improper balancing of body weight.
- N. Holding on to antenna lines, coax, conduits, etc. for support.
- O. Showing off.
- P. Climbing while under the influence of alcohol or drugs.
- Q. Climbing when ill or on medication that may negatively impact or impair good judgement or performance and is prohibited by company policy.

5. Anchorages, Aerial, and Fixed Climbing Devices

5.1 Anchorage. Attachment to slanted structure members should be avoided. Anchors may be welded (closed) eyebolts, rigging points, slings, ropes, or other attachments designed into the structure or a lanyard wrapped around structural members that limits movement of the lanyard at the connection point. The tower manufacturer shall identify the acceptable anchorage point for supporting the fall protection system. Anchorages shall meet the minimum requirements of an engineered system for each worker attached. An engineered system shall be in compliance with the mandatory criteria for personal fall arrest systems in OSHA 29 CFR-1910.66 App C, and must meet and/or consider the following criteria:

- A) An anchorage of sufficient design to withstand a static load of 22.2 kN (5,000 pounds) or the maximum anticipated impact load times an overload capacity factor (OCF) of at least 2.0 for one worker.
- B) An additional OCF of 0.2 multiplier for each additional worker attached to the anchorage.
- C) Inclusion of additional static and dynamic loads associated with hardware and rigging attached to the anchorage.
- D) Energy absorbing properties of the fall arrest system, when incorporated into the anchorage design, will usually reduce the maximum forces imposed onto the anchorage.
- E) Attachment around a lattice steel 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. Preferred lattice anchorages are around multiple bolted angle iron members or around and above joints where multiple members are connected.
- F) Lattice steel tower member anchorage notes:
 - 1. Attachment around and above all steel tower joints is permitted.
 - 2. Attachment around a steel 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.
 - 3. Attachment around multiple bolted tower members is permitted.
 - 4. Anchorages shall be visually inspected at the time of attachment for loose or missing bolts, cracks, and bends. Damaged anchorages shall be repaired prior to use.
 - 5. Fall arrest anchorages that have received a shock load shall be immediately inspected for damage.
 - 6. The job supervisor, in concurrence with the worker, shall determine if the anchorage is to be reused.
 - 7. Damage to anchorages shall be reported.

5.2 Aerial Devices. Only qualified operators shall be permitted to operate an aerial device. Qualified operators shall be certified through training and experience to operate the aerial device employed.

Bucket and platform anchorages shall meet minimum engineered loads while limiting potential free falls to 1.9 m (6 feet) 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.

5.3 Communication Structure Climbing Safety Devices. Communications tower ladder climbing devices shall be kept in good repair. Devices determined to be hazardous shall be immediately

removed from service, reported to the Safety Manager or Program Coordinator, and tagged or clearly marked as “Defective - Do Not Use”. Corrective measures shall be completed prior to the next climb.

6. Fall Protection Requirements for Elevated Work

6.1 General. Towers should be designed to eliminate or minimize the need for climbing. Aerial devices should be the first preference for work at elevated locations. This section defines the fall protection requirements for working at elevations on communications towers and related equipment. The design and type of structure determines the method of climbing, PPE to be used, and fall protection devices required for climbing, transferring, resting, working, and rescue.

6.2 Qualified Climber Classification. An employee may become certified as a “Qualified Climber” as defined in the MT2W Tower Climbing and Fall Protection Program, after successfully completing MT2W approved training courses and satisfying physical fitness requirements. All qualified climbers shall be trained in accordance with Section 8 (Training), and shall be equipped in accordance with the requirements of their profession and position descriptions. Qualified climbers shall climb, move, rest, and work in accordance with the requirements of this policy . All qualified climbers shall have passed a physical examination to ensure they are physically fit for the stresses of tower climbing and rescue

- a) During all climbing activities at least two (2) qualified climbers shall be present on the job site.
- b) MT2W approved training programs will be established to train and certify qualified climbers.
- c) Other climbers of MT2W job structures, both non-MT2W employees and contractors, must be qualified in accordance with OSHA and this policy.
- d) Tower climbers should not service radio antenna systems connected to live radio transmitting equipment. All transmitters should be de-activated and prevented from being activated while tower climbers are climbing in the vicinity or servicing the antenna systems. (Reference OSHA Regulations 29 CFR 1910.268 (m)(7) & (p)(3) Telecommunications, and 29 CFR 1910.97 (a)(2)(I) Nonionizing Radiation.)

6.3 Common Requirements. Prior to any tower climbing work, a Job Hazard Analysis (JHA) form must be reviewed and completed for the job site (see Appendix C). The JHA shall include a pre-climb tower checklist and inspection report to accurately determine the overall tower condition and what PPE is required. Towers which are deemed “questionable” or found to have structural defects or inoperable safety devices shall not be climbed.

Workers shall be attached to an engineered anchorage at all times when working or resting at elevated locations (4 feet and above). Moving, relocating, transitioning, and transferring are all activities that are incidental to the work and also require attachment to an engineered anchorage. Tower climbers should check for a safe “drop zone” area on the tower when positioning themselves at the work position. (See definitions for drop zone and work position.)

Free falls into a full body harness shall be limited to 1800 pounds (8 kN) and/or no more than 6 feet (1.9 m) with a maximum additional 1.1 m (3.5 feet) for deceleration of the fall arrest device (2.9 m (9.5 feet) total fall distance).

6.3.1 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 of cross arms (crossed tower members and diagonal bracing) in lieu of a ladder is not recommended. Climbing pathways should be clear of any obstructions.

6.3.2 Working from an Aerial Device. Prior to the bucket or platform being raised, 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. Snap hooks shall be of the locking type. Working or standing on the lip of a bucket or top rail of an aerial device shall not be permitted.

6.3.3 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:

- a) 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.
- b) 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 of ANSI/SIA 92.2.
- c) 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 to be 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 transferring, the operator may work on other jobs at the site provided the operator is available when needed at the controls.
- d) A climber transferring between an aerial device and a structure shall be attached to the 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.
- e) There shall be a second qualified climber present at the location at any time this procedure is performed.

6.4 Communications Structure Requirements. All towers subject to climbing shall be certified as "Safe To Climb" by a qualified MT2W employee. Tower certifications may be accomplished by qualified MT2W employees, state licensed Professional Engineers (PEs), or qualified tower manufacturer's representatives. Qualified MT2W employees will be those possessing the necessary experience and knowledge of communication towers to be classified as tower certification experts. Tower certifications shall consist of a detailed structural analysis and report on the tower performed on a site by site basis to determine tower structure integrity, fall

protection system adequacy, and ensure compliance with all current OSHA standards and regulations

6.4.1 Fixed Ladders. Fixed ladders shall be used for ascending and descending communications structures, except where work assignments or conditions dictate otherwise. When ladder safety climbing systems are available and operational, they shall be used to ascend and descend a communications structure. Transitioning to the work position shall be accomplished while maintaining 100 percent attachment using a full body harness and lanyard or lifeline in conjunction with an energy-absorbing or self-retracting lanyard or lifeline.

In situations where ladder safety climbing systems are not available or operational and climbing has been determined necessary, qualified climbers will be allowed to climb while maintaining 100 percent attachment.

One hundred percent attachment is not required while utilizing approved work platforms, having guardrails and kickboards in accordance with OSHA 29 CFR 1910.23 and 1910.24, as a means of transitioning from the climbing ladder or other means of ascent/descent to the work position.

Fall arrest systems or devices shall permit the climber to climb without intervention on the part of the climber. Both hands shall be free for climbing at all times. The connection between the slider and the point of attachment to the full body harness shall not exceed 230 mm (9 inches).

6.4.2 Portable Straight or Extension Ladders. Portable straight or extension ladders shall be placed at an angle that will not permit slippage of the ladder base when climbing. A ground worker should support unsecured ladders until the climber has transferred from the ladder or has secured the ladder. The ladder shall be secured (tied) to the equipment to prevent slippage. (Reference OSHA Regulations 29 CFR 1917.119 - Portable Ladders.)

6.5 Pole Structures. All pole communication structures that require climbing shall be equipped with safety climbing systems and fall arrest devices. When climbing on step bolts, fixed ladders, or moving between work or rest positions, climbers shall maintain 100 percent attachment.

6.5.1 Wood Pole Structures. Wood pole towers are not recommended for use as communications structures. Wood poles, however, when used shall be climbed with a full body harness and positioning strap. Prior to climbing wood poles, an inspection shall be made for shell rot or other defects by the worker to determine that the structure is capable of sustaining the additional or unbalanced loads to which they will be subjected. Where poles or structures may be unsafe for climbing, they shall be maintained by use of an aerial device or shall not be climbed until made safe by guying, bracing, or other adequate means of support.

6.5.2 Non-Wood Pole Structures. Concrete, fiberglass, and steel poles shall be equipped with fall arrest devices if climbing is required for servicing antenna systems. If climbed, climbers shall maintain 100 percent attachment to the structure with a full body harness and positioning strap. This includes bolt tightening, resting, and other activities incidental to climbing or transitioning from one location to another on the pole.

6.6 Roof Top and Miscellaneous Structures. Employees positioned on a horizontal or vertical surface with an unprotected side or edge, which is four (4) feet or more above a lower level, shall be protected from falling by use of guardrail systems, safety net systems, or personal fall arrest systems. Roof tops are considered elevated working surfaces and require the employee to be tied off to an anchorage point that will withstand 5,000 pounds per person or the maximum anticipated impact load times an OCF of at least 2.0 for one worker (Reference OSHA 29 CFR 1910.66).

6.6.1 Detachable Ladders. A qualified climber in the process of installing or removing detachable ladders on the structure shall use an appropriate fall protection system.

7. Rescue Procedures and Precautions

7.1 General Requirements. A Job Hazard Analysis (JHA) (see Appendix C) shall be reviewed and completed by the work group and signed by the on site job supervisor prior to each tower climbing job assignment. It shall list each step of the task in the proposed order of occurrence, and shall include an examination of each step to determine the hazard potential. After identifying each potential hazard, a determination shall be made on how each hazard could be eliminated or minimized following safe job procedures. A vital step will be rescue procedures and equipment to be used in the event of an incident.

The rescue procedure shall provide prompt rescue of employees or a means of self-rescue (e.g. providing controlled descent device, radio, etc.). A work briefing (meeting) 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.

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

7.2 Rescue. Rescue procedures, which provide for the prompt rescue of a worker when working in an elevated position or in the event of a fall, shall be established. These procedures shall assure that self-rescue techniques are available.

Workers shall be trained and shall have demonstrated proficiency in the rescue procedures relevant to the work they perform. Qualified climbers shall practice rescue techniques as will others involved with climbing activities on a regular basis at least annually.

7.3 Precautions

7.3.1 General. Manufacturer's recommendations, in addition to MT2W requirements, should be followed for the care, use, replacement, and maintenance of PPE and all climbing and safety equipment. Only PPE certified by the manufacturer to meet all OSHA standards and regulations is authorized.

- 7.3.2 Safety and Health Precautions. Employees should not be assigned to work in hazardous areas/activities except in pairs, and always with established communications. Tower climbing will only be accomplished by qualified climbers in pairs.
- 7.3.3 Check-Out-Check-In, MT2W's 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.
- 7.3.4 Radio Station Deactivation, 29 CFR 1910.97 and 1910.268. As per Section 6.2.1 (d), and OSHA Regulations 29 CFR 1910.97 for non-ionizing 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). OSHA defines the radiation protection guide for radio stations as 10 milliwatts per square centimeter in 29 CFR 1910.97(a)(2)(I). Should climbing or transitioning to the tower work position involve working in close proximity to energized radio transmitter antenna systems, those transmitters feeding the antenna systems should be deactivated prior to the tower being climbed. Check-Out-Check-In 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 tower being serviced.
- 7.3.5 SECTION LEFT INTENTIONALLY BLANK
- 7.3.6 Medical Condition of the Climber. A climber that is ill and/or on medication that may inhibit actions or cause over stimulation, dizziness, drowsiness, etc., will not climb. All team members should be aware of medical conditions of the other team members. Stress and physical exertion may induce an adverse reaction and ground crews should be alert and able to recognize symptoms. The medicated climber will not function as a ground safety person because they may be required to perform a rescue.
- 7.3.7 Safeguards for Personal Protection Working Near Energized Equipment, 29 CFR 1910.335. Whenever MT2W employees are operating within the close proximity of an electrical power line or service drop, they should inform the utility company. The utility company should move, cover, or barricade the exposed energized source. Do not trust the wire of the service drop to be insulated unless totally encapsulated.

8. Training

8.1 General Requirements. The MT2W's policy for training and certification of employees for tower climbing consists of a four-part program. The program is based on employees becoming certified to hold a "Qualified Climber" classification as defined in Section 6.2. Qualified climbers will be trained in accordance with this policy. The four part program is generally described as follows:

- (1) Policy. Climbers will be tested for knowledge and understanding of MT2W's tower climbing policy and competency with the Telecommunications Tower Climbing and Fall Protection Policy.
- (2) Climbing Techniques and Equipment. Climbers will be trained in the principles of fall protection, use and care of a full body harness, safety climbing devices and tower climbing

techniques. Also, training may include use of aerial man lifts and transferring between equipment.

- (3) Tower Rescue Techniques. Climbers will be trained in recognizing emergencies and using proper tower rescue techniques.
- (4) Physical Fitness. Climbers will be tested for physical fitness at a level necessary to perform the job of tower climbing.

Workers shall be trained in the use of fall protection and rescue equipment and the application limits, proper anchoring, tie-off techniques, determination of elongation and deceleration distance, methods of use, and inspection and storage of the system. 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.

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.

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

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 that they are working with regarding the stresses and resultant effects on safety margins while climbing or working aloft.

MT2W approved training programs may be established specifically to train climbers under the supervision of a qualified climber who has been certified as a "trainer" in a "Train the Trainer" program (see Section 6.2.1.b).

8.2 General Training Requirements for Qualified Climbers. Workers whose job assignment requires climbing poles, steel communications towers, or other similar structures shall be trained as qualified climbers. Training shall be specific to the type of work to be performed. When the worker successfully completes this training, the climber may be considered for classification as a "qualified climber" through the certification program. Training shall include:

- A) Recognition of hazards unique to the work to be performed and to avoid unsafe actions while mastering the rigors of climbing and positioning for work on the structure.
- B) Selection of the proper climbing equipment and fall protection system for the specific type of work to be performed.
- C) Proper uses of the fall protection devices at the work position.
- D) Various methods for climbing wood poles, steel lattice radio towers, and other similar structures such as transitioning, belting, and other climbing techniques.
- E) Methods to identify energized power lines, apparatus, other auxiliary equipment on the tower, and to be knowledgeable of the rules applicable to work on and around the structure near energized power lines.

- F) Techniques for safely performing aerial rescue of an injured or ill climber.
- G) Proper care, inspection, and maintenance of PPE and climbing equipment and fall protection systems or devices.
- H) Demonstrated proficiency in climbing structures and performing at elevated work positions.
- I) SECTION LEFT INTENTIONALLY BLANK.
- J) Competency in MT2W Policy.
- K) SECTION LEFT INTENTIONALLY BLANK.
- L) Knowledge of the JHA process, and recognition of unsafe conditions and defective safety climbing/arrest equipment.

Required training shall be by classroom and on-the-job. All required testing for qualified climber certification and rescue shall be conducted by a qualified instructor.

8.3 Documentation. Documentation shall consist of a certificate indicating that the individual has successfully completed the course of instruction and has the skill required to be proficient in the Tower Climbing and Fall Protection Program required by this chapter. 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 for the duration of the worker's certification or employment.

9. References

The following publications provide detailed information and specifications for the purchase, maintenance, and use of fall protection equipment. When the following standards are superseded by an approved revision, the revision shall apply.

- [1] ANSI Std A14.1, Portable Wood Ladders, Safety Requirements For.
- [2] ANSI Std A14.2, Portable Metal Ladders, Safety Requirements For.
- [3] ANSI Std A14.3, Fixed Ladders, Safety Requirements For.
- [4] ANSI Std A14.4, Job-Made Wooden Ladders, Safety Requirements for.
- [5] ANSI Std A14.5, Safety Requirements for Portable Reinforced Plastic Ladders.
- [6] ANSI Std A14.7, Mobile Ladders, Stands, and Mobile Work Platforms, Safety Requirements
- [7] ANSI Std A92.2, Vehicle Mounted Elevating and Rotating Aerial Devices (SIA).
- [8] ANSI Std A92.3, Elevating Work Platforms, ly Propelled (SIA).
- [9] ANSI Std A92.5, Boom-Supported Elevated Work Platforms.
- [10] ANSI Std A92.6, Work Platforms, Self Propelled Elevating (SIA).
- [11] ANSI Std C2, National Electrical Safety Code**
- [12] ANSI Std P1307, Trial Guide for Fall Protection for the utility Industry.
- [13] ANSI Std Z133.1, Tree Care Operations - Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting - Safety Requirements.
- [14] ANSI Std Z359.1, Personal Fall Arrest Systems, Subsystems, and Components.

- [15] ASTM F887, Standard Specifications for Personal Climbing Equipment.
- [16] ASTM Std, Non-Conductive Rope for Utility Purposes.
- [17] OSHA 29 CFR 1910.97, Subpart G – Non-ionizing Radiation.

[18] OSHA 29 CFR 1910.27 - Fixed Ladders

- [19] OSHA 29 CFR 1910.66, App C - Personal Fall Arrest Systems.
- [20] OSHA 29 CFR 1910.132 to 1910.138 - Personal Protective Equipment
- [21] OSHA 29 CFR 1910, Subpart R - Special Industries (1910.261 to 1910.272 App C).
- [22] OSHA 29 CFR 1926, Safety and Health Regulations for Construction, Subpart M - Fall Protection (1926.500 to 1926.503).
- [23] IEEE Std 516, Guide for Maintenance Methods on Energized Power Lines (ANSI).

Appendix A

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Appendix B

Addendum to Middle Tennessee Two-way Incorporated
Tower Climbing Safety Policy.

A. Climbing Helmets

1. Climbing helmets provided by MT2W are designed to give maximum protection consistent with light weight and comfort. The helmet's purpose is to give protection from falling objects and to protect against impact with fixed objects. Helmets shall be worn by all employees anytime anyone is on the tower.
2. Activities at height carry serious risk for the head. Wearing a helmet reduces the risk of head injury and therefore should always be worn during tower work. During blows of extreme violence the helmet plays its role by absorbing the energy created by those blows sometimes even distorting, sometimes to the breaking point.

B. Use and Care

1. Items below illustrate ways of utilizing the safety helmet. Only the techniques discussed are advised, all other uses are excluded. **IMPROPERLY USED, THERE IS A DANGER OF DEATH.**

If there is a question about the use of the helmet, contact your supervisor immediately. Do not proceed with the work until there is a thorough understanding of the problem. Gaining an adequate sense of what is safe and what is not is your responsibility. It is your life after all. You must assume all risks and responsibilities for the proper use of your climbing helmet. If you cannot assume this risk you need to look for employment elsewhere.

2. **FITTING:** For a good fit, begin by fitting to the head size by using the adjustment on the right. Adjust the nape strap by means of the adjuster on the left. The chin strap is provided with a quick adjust buckle which may be adjusted on or off the head.

3. **MODIFICATIONS:** The helmet is not to be modified in any way not approved by the manufacturer. Drilling additional holes in the helmet to mount items could weaken the shell. Rubber or elastic straps are the best method of attaching lights or cameras to the helmet without affecting its strength.

4. **SAFETY=VERIFICATION:** Check the condition of this product, internally and externally before each use. Do not hesitate to scrap a helmet showing signs of weakness. After a heavy blow it is essential to replace the helmet since its energy absorbing capacity will be reduced.

5. **MAJOR SHOCK:** Do not continue to use your helmet after a major shock even though there are no visible signs of damage. Internal damage may have occurred thus reducing the margin of safety. In case of doubt contact notify your supervisor.

6. **CLEANING, MAINTENANCE AND STORAGE:** The helmet should be washed with clean cold fresh water. Do not use a high pressure hose. Use a soap or soap powder suitable for delicate fabrics to wash the straps. Then leave to dry in a cool, dark, well ventilated place. Never allow the the helmet to come into contact with corrosive substances or solvents or store at extreme temperatures. Stored away from light and at room temperature the Petzl Ecrin ARoc® helmet will retain its qualities for five years from its date of manufacture. After that time it is prudent to replace it. To remove traces of adhesive (stickers for example), you may use methyalted spirits.

7. **CHEMICALS:** All chemical products, corrosive materials and solvents should be regarded as harmful. If it is absolutely necessary, or if there is a risk of contact with chemicals in our various work environments notify your supervisor and he will determine if there is a potential problem.

8. **LIFETIME OF HELMET:** It is known that equipment deteriorates progressively with use. After first use this product may have a life of up to five years without taking wear into account. However, wear or damage could occur on the first use which limits its life to that use. Surface damage, corrosive wear, mechanical wear or impairment of the mechanical function of the helmet is easily observed. In addition to the checks before and after each use a detailed inspection must be carried out by a competent person every three months.

9: **TEMPERATURE:** The helmet has a temperature range of -30C to +50C, much better than human beings.

10. DISINFECTION: If it is necessary to disinfect the helmet use a disinfectant compatible with polyamide, polyester, polycarbonate, PVC etc. Use in a solution diluted with clean water at a maximum temperature of 20C. Allow to soak for an hour then rinse in clean cold water. Dry slowly, away from direct heat sources.

Appendix C

JOB HAZARD ANALYSIS

1.1 References. 485 DM Safety & Health Handbook Chapter 14.

1.2 Procedures. Job Hazard Analysis (JHA) procedures include identification of tasks, potential hazards, and safe job practices/procedures. Employees and supervisors should work together in the development of the JHA to assure that all characteristics of the job are addressed and that the safest and most efficient means of performing a job will be utilized. A JHA is required to be completed for:

- A. Jobs or work practices which have potential hazard;
- B. New, non-routine, or hazardous tasks to be performed where potential hazards exist;
- C. Jobs that may require employee use of out-of-the-ordinary personal protective equipment (PPE).
- D. Changes in equipment; work environment, conditions, practices; policies, or materials.

1.3 Responsibility. Supervisors shall discuss the job hazards with employees prior to beginning new projects or upon changing work sites, identify any hazards not noted on the JHA and discuss ways to reduce these hazards including the use of protective equipment. Supervisors and appropriate line managers shall ensure that established JHAs are reviewed and signed prior to any non-routine task, or at the beginning of a job.

A. Conducting a Job Hazard Analysis. In order to develop a JHA, the job to be evaluated is broken down into basic steps by the supervisor and the employee assigned to perform the job. They identify hazards and safe job procedures. The JHA should be outlined in a form suitable to record the particular job.

1. Identification of Tasks. Each step of a job should identify a major task and briefly describe each in the order in which it is performed. Three or four words may be sufficient to describe each job step. Avoid steps that are too detailed. They will make the JHA unnecessarily long and trivial. For example, sanding and painting a picnic table are major tasks to be listed; opening a paint can is not considered a major task and would not be included on the JHA. Most jobs can be separated into 12-15 basic steps.
2. Potential Hazards. Each step is examined to identify potential hazards. Hazards may be associated with work practices, procedures, equipment, materials, or environment. Questions to be considered to help identify specific hazards include: Could the worker come in contact with?; be struck by?; strike against?; be caught in, under, between?; slip, trip, or fall?; or suffer from overexertion?
3. Safe Job Procedures. Safe job procedures to reduce or abate the hazards are identified. The use of general terms such as "be careful," use caution," or work safely" should be avoided. Safe job procedures will normally fall into one of the categories listed below:

- a. Environmental change.

- b. Reduction in the frequency a task is performed.
 - c. Personal protective equipment changes.
 - d. Job procedures/work practices.
 - e. Safe behaviors.
- B. Job Hazard Analysis Review. A JHA review by an authorized employee of MT2W is done to ensure that MT2W policy and OSHA standards are integrated into the JHA, and that the personal protective equipment required is properly selected and meets the appropriate ANSI standard. The Safety Manager will sign the JHAs after review and return the original to the supervisor.
- C. Job Hazard Analysis Reevaluation. Established JHAs should be reevaluated periodically, at least every 3 years, to assure that they reflect the latest, safest, and most efficient way to perform the task. New equipment, tools, methods, and changes in safety standards should require modifications in JHAs.
- D. Job Hazard Analysis Record keeping. Supervisors are responsible for maintaining JHA records within their work group.