

# SECTION 1.0

## TOWER CLIMBING

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## Document Change History

Edition Number	Reason and Description of Change	Affected Pages	Effective Date
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## 1 Purpose

This document establishes the ALU Tower Climbing Safety Procedures for all ALU employees that climb towers.

## 2 Scope

This applies to all ALU organizations and employees that climb towers. Where any national, international, or local legal or customer requirements or standards are more stringent than those cited in this document, these requirements shall be followed.

The guidelines offer advice on practices, which if followed, would be deemed to be compliant. Adherence to the Procedures is not mandatory and local processes can be followed as long as they are documented and are consistent with these Procedures and meet the Company Requirements.

## 3 Roles and Responsibilities

The following is a table describing the Roles and Responsibilities of individuals and groups dealing with tower climbing operations. Refer to Section 0.0 for Organizational Roles and Responsibilities.

Individual/Group	Roles/Responsibilities
<p style="text-align: center;"><b>Tower Climber (Affected Employee)</b></p>	<p>Some of the roles and responsibilities can be done by the same person</p> <ul style="list-style-type: none"> <li>• Assumes responsibility for one’s own safety and by their actions for the safety of fellow workers.</li> <li>• Be knowledgeable of the hazards that may be encountered during tower climbing operations, including the signs, symptoms, and consequences of injuries sustained by tower climbers that are suspended for extended periods of time after</li> </ul>

	<p>experiencing a fall (e.g., orthostatic intolerance, suspension trauma).</p> <ul style="list-style-type: none"><li>• Knows how to properly use necessary equipment (i.e., Personal Fall Arrest System (PFAS), rescue equipment, communications, other applicable personal protective equipment (PPE), fixed ladders, first aid kits and RF monitoring equipment where necessary), except to the extent that the equipment will be provided and used by rescue services.</li></ul> <p>Note: PPE includes hard hat with a chin strap, eye protection, sturdy foot wear with a heel and which is appropriate for potentially wet environments, and gloves. Additional PPE such as hearing protection may be required.</p> <ul style="list-style-type: none"><li>• Has received Tower Climbing and First Aid/CPR training which shall include information on protection against Bloodborne Pathogens.</li><li>• Participates in Site Risk Assessments (Appendix C) and Pre-Job Briefings before starting work, and abides by conditions stipulated for the operation.</li><li>• Inspects equipment prior to each operation.</li><li>• Wears proper equipment configuration at all times during Climbing Operations.</li><li>• Uses equipment in accordance with manufacturer's instructions.</li><li>• <b>Stays connected 100% of the time while climbing, descending and working on the tower.</b></li><li>• Maintains communication with ground technical support.</li><li>• Communicates with ground technical support if conditions encountered are deemed unsafe to complete work or to remain on the tower.</li><li>• Participates in emergency drills at least once a year or more frequently as required by local legal or customer requirements.</li></ul>
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Individual/Group	Roles/Responsibilities
<p>Ground Support</p> <p>Note: When an employee is providing ground support he or she may have to climb the tower to assist with a specific task or when having to perform rescue operations.</p>	<p>Some of the roles and responsibilities can be done by the same person</p> <ul style="list-style-type: none"> <li>• Be knowledgeable of the hazards that may be encountered during tower climbing operations, including the signs, symptoms, and consequences of injuries sustained by tower climbers that are suspended for extended periods of time (e.g., orthostatic intolerance, suspension trauma).</li> <li>• Knows how to properly use necessary equipment (i.e., Personal Fall Arrest System (PFAS), rescue equipment, communications, other applicable personal protective equipment (PPE), fixed ladders, first aid kits and RF monitoring equipment), except to the extent that the equipment will be provided and used by rescue services.</li> </ul> <p>Note: PPE includes hard hat with a chin strap, eye protection, sturdy foot wear with a heel and which is appropriate for potentially wet environments and gloves. Additional PPE such as hearing protection may be required.</p> <ul style="list-style-type: none"> <li>• Has received Tower Climbing and First Aid/CPR training which shall include information on protection against Bloodborne Pathogens.</li> <li>• Participates in Site Risk Assessments and Pre-Job Briefings before starting work, and abide by conditions stipulated for the operation.</li> <li>• Inspects equipment prior to each operation.</li> <li>• Summons local Rescue Services prior to starting rescue operations.</li> <li>• Wears proper equipment configuration at all times when having to climb towers and/or having to perform rescue operations.</li> <li>• Uses rescue equipment in accordance with manufacturer's instructions.</li> </ul>



	<ul style="list-style-type: none"><li>• <b>Stays connected 100% of the time when having to climb towers or while performing rescue operations.</b></li><li>• Maintains communication with the climber.</li><li>• Stops work and communicates with the climber when conditions that are deemed unsafe to complete work or to remain on the tower develop (i.e., weather conditions, illumination levels, etc.).</li><li>• Participates in emergency drills at least once a year or more frequently as required by local legal or customer requirements.</li></ul>
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Individual/Group	Roles/Responsibilities
Competent Person / Team Leader	<p>Some of the roles and responsibilities can be done by the same person</p> <ul style="list-style-type: none"> <li>• Be knowledgeable of the hazards that may be encountered during tower climbing operations, including the signs, symptoms, and consequences of injuries sustained by tower climbers that are suspended for extended periods of time (e.g., orthostatic intolerance, suspension trauma).</li> <li>• Knows how to properly use necessary equipment (i.e., Personal Fall Arrest System (PFAS), rescue equipment, communications, other applicable personal protective equipment (PPE), fixed ladders, first aid kits and RF monitoring equipment where necessary), except to the extent that the equipment will be provided and used by rescue services.                     <p style="margin-left: 20px;"><b>Note:</b> PPE includes hard hat with a chin strap, eye protection, foot wear appropriate for potentially wet environments and gloves. Additional PPE such as hearing protection may be required.</p> </li> <li>• Has received Tower Climbing and First Aid/CPR training which shall include information on protection against Bloodborne Pathogens.</li> <li>• Performs Site Risk Assessments and conducts Pre-Job Briefings before starting work.</li> <li>• Visually inspects the tower base for damage, deterioration, structural deficiencies and functionality of safety features and anchorages before employees are allowed to climb the tower.                     <p style="margin-left: 20px;"><b>Note:</b> Shall ensure that the tower is visually inspected for these items, as the tower is ascended to the elevation point where work is being performed.</p> </li> <li>• Ensures equipment is inspected prior to each operation.</li> <li>• Ensures a site specific Emergency Plan is available, and reviewed during the pre-job briefing with tower climbers and</li> </ul>

<p><i>Continuation of role for Competent Person / Team Leader</i></p>	<p>ground technical support prior to starting the operation.</p> <ul style="list-style-type: none"> <li>• Ensures the location of medical facilities and local Fire Rescue closest to the immediate work area is identified.</li> <li>• Ensures means of communication are established prior to starting any tower climbing operation(s).</li> <li>• Ensures adequate alternate means of communication are identified when line or wireless means are not available or effective.</li> <li>• Ensures proper equipment configuration is worn at all times when having to climb towers and having to perform rescue operations.</li> <li>• Ensures rescue equipment is used in accordance with manufacturer’s instructions.</li> <li>• Stays onsite and monitors the operation at all times when employees are exposed to fall hazards above 1.8 meters (6 feet).</li> <li>• Stops work and communicates with all employees when conditions are deemed unsafe to complete work or to remain on the tower.</li> <li>• Takes prompt corrective measures to eliminate hazards in the surroundings or working conditions that are hazardous or dangerous to employees or others in the area.</li> <li>• Stops work if unable to implement necessary corrective actions or when conditions that can’t be controlled arise (e.g., adverse weather conditions).</li> </ul>
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## 4 Definitions and Acronyms

***Affected employee*** - is any employee that is a certified tower climber who climbs towers for any reason, including, but not limited to: designing, installing, servicing, maintaining, and/or inspecting wireless services equipment and/or antennas.

**ALU** - Alcatel-Lucent

**Anchorage** - a secure point of attachment for lifeline, lanyards, or deceleration devices. A reliable anchorage point must be strong and sturdy, capable of supporting the high impact of falling a distance of no more than 1.8 meters (6 feet).

**Certified Tower Climber** - is an employee that has been medically certified as physically capable of climbing towers and has successfully completed an approved tower climbing safety and rescue training course and certification.

**Competent Person/Team Leader** - is a person who is trained to identify existing and predictable hazards in the surroundings or working conditions that are hazardous or dangerous to employees, and who has authorization from his employer to take prompt corrective measures to eliminate them, including halting the work when required by the requirements listed in this Procedure or as required by more stringent local legal or customer requirements.

**CPR** - Cardiopulmonary Resuscitation

**Drop Zone** - is the area into which items dropped from overhead are likely to land. The drop zone of a tower while climbers are on the tower, can be determined by measuring the radius out from the tower base at least on one-half of the height (e.g., if a climber is up 30.5 meters (100 feet) on the tower, the drop zone is a circle with a 15 meters (50 foot) radius from the base of the tower). Drop zones are used for determining hard hat areas.

**EHS** - Environment, Health, and Safety

**EHS Coordinator** - is the ALU employee assigned to handle specific EHS responsibilities for the operations of a section of a country, or cluster of countries.

**Elevated (High Angle) Rescue** - means the process by which methods and equipment are utilized in order to gain access to and egress from the location of an injured employee(s) on the tower structure, and lower both the injured employee(s) and the rescuer(s) safely to the ground.

**Employee** - is any full-time or part-time worker on the Alcatel-Lucent payroll, or any contract worker whose daily activities are directly supervised by Alcatel-Lucent employees.

**Guidelines** - offer advice on practices, which if followed, would be deemed to be compliant with the requirements. Adherence to the guidelines section is not mandatory and local processes can be followed as long as they are documented and meet the requirements sections of this document.

**Ground Technical Support** - is an employee that must be on site and properly monitoring the operation by fulfilling roles and responsibilities listed in Section 3.

**Hard Hat Designated Area** - defined by the drop zone applicable to the operation. Please refer to “Drop Zone” for additional information.

**Installation operations** - are those deployment-related work activities and processes performed by ALU (Services) to meet the needs of its customers, including the design, construction, maintenance and integration of communications equipment and systems, as well as the warehousing and provisioning of the equipment to the customer's location.

**Legal requirements** - are those country and local EHS laws and regulations that apply to the installation operations in a particular country.

**Line managers** - are all supervisors and managers involved in installation operations.

**One-Hundred Percent (100%) Fall Protection** - means each employee exposed to fall hazards from locally established minimum heights or \*1.8 meters (6 feet) while ascending, descending, or moving point to point, must be securely connected to the structure with fall protection equipment at all times. \*Note: For countries who do not have local laws or minimum established heights they will have to adopt 1.8 meters (6 feet) as their minimum heights.

**Orthostatic Intolerance** - condition caused by the accumulation of blood in the veins while in a sedentary position. This can be fatal if resulting in suspension trauma.

**Personal Fall Arrest System (PFAS)** - is the personal equipment that employees utilize in conjunction with 100% fall protection systems, including connectors, body harnesses, shock absorber lanyards and deceleration devices.

**Requirements** -Indicates a mandatory company requirement to adopt the procedure/process. Failing to adopt requirements will result in a non-conformance finding in an EHS audit.

**Services** is the Alcatel-Lucent organization responsible for consulting, designing, installing, maintaining, operating, deploying and servicing Alcatel-Lucent products and communications systems.

**ALU Regional EHS Leader** - is the individual assigned to handle specific EHS responsibilities in support of the Services EHS Leader for the installation / operations in a specific Region.

**Shall** - indicates a requirement for compliance that must be followed.

**Should** - indicates a strong recommendation that is not required, but would help to improve EHS performance.

**Suspension Trauma** - fatalities resulting from orthostatic intolerance are referred to as “harness-induced pathology” or “suspension trauma”.

## 5 Referenced and Supplementary Documents

Appendices	Document Title
Appendix A	Guide for Working in Drop Zone
Appendix B	Manual Rigging And Hoisting - For Materials, Tools And Equipment On Telecommunications Towers, Poles And Other Structures
Appendix C	Risk Assessment / Tower Climbing Work Plan and Emergency / Rescue Plan Templates
Appendix D	Tower Safety Equipment Specifications
Appendix E	ALU Contractor Tower Climbing Procedure Assessment
Section 3	Lockout/Tagout Procedure
Section 6	Personal Protective Equipment
Refer to local in country procedures	Radio Frequency Safety Procedure

## 6 Process Flow Diagram

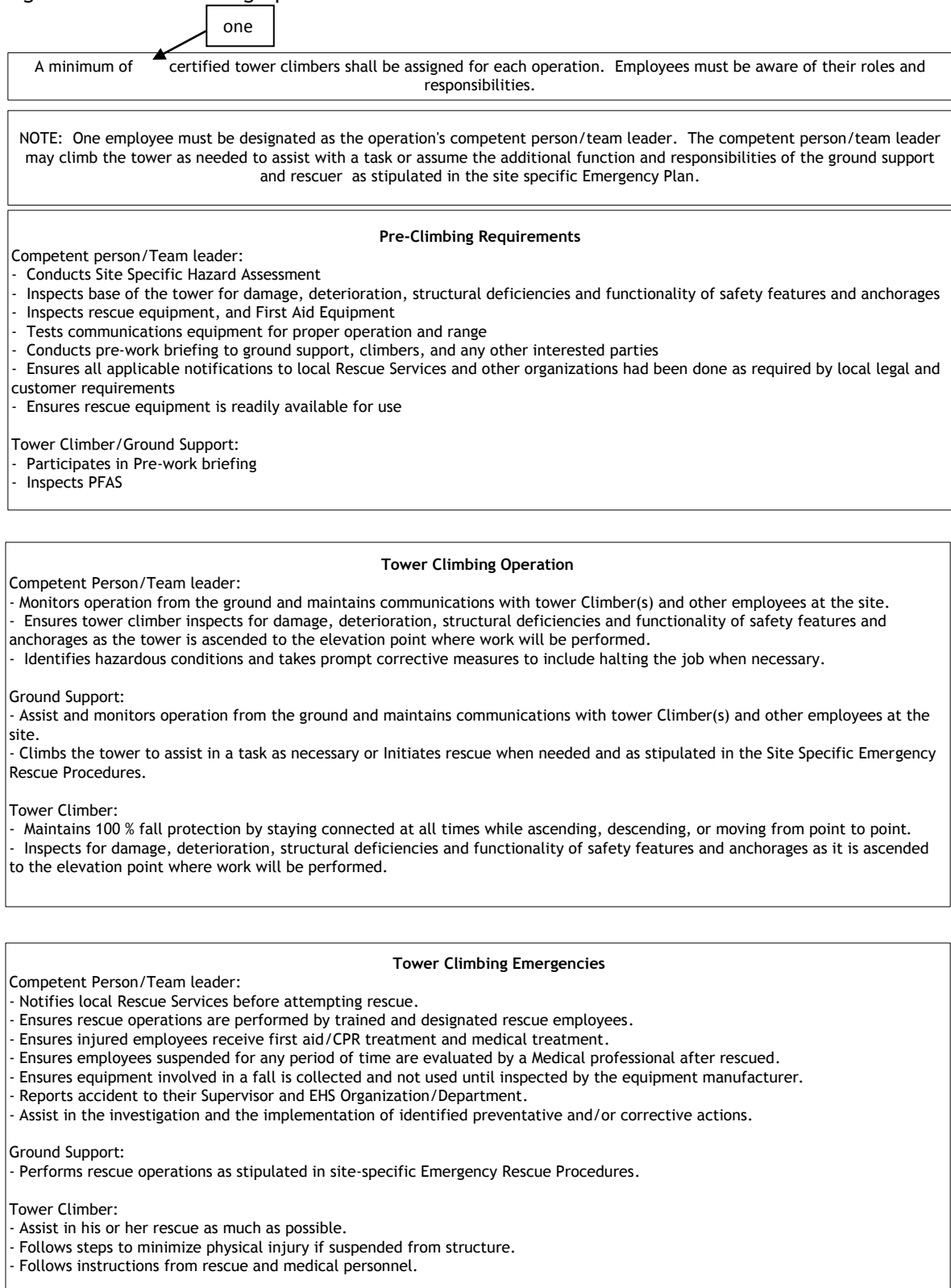
### 6.1 Requirements

Not applicable

### 6.2 Guidelines

The following is a recommended process flow for Tower Climbing Operation

Figure 1 - Tower Climbing Operation





## 7 Process/ Procedure/ Work Instruction

### 7.1 General

Climbing towers is a complex and dangerous operation that requires a high level of mental alertness, physical fitness, preparation, knowledge, experience and training. Climbing towers exposes the climber to a risk of falling from heights. Accidental falls are an important cause of occupational fatalities worldwide, resulting in thousands of deaths per year globally. Death is common in falls of 2 meters or more.

The potential hazards of working on or near towers include, but are not limited to:

- falling from the tower;
- bent, loose, wet or missing ladder rungs and/or tower support elements;
- loose or rusty bolts;
- antennas, equipment and/or structural members in the climbing path;
- snagging tools and/or clothing on tower protrusions;
- falling tools or equipment;
- energized antennas (refer to local in country RF Safety procedures);
- high winds;
- overexertion;
- electrical wires and/or equipment (refer to local in country Lockout/Tagout procedures);
- insects, birds or other animals;
- bright sunshine or intense glare;
- extreme heat or cold;
- chance of rain, snow or hail;
- dew, moist surfaces (moist galvanized steel and painted surfaces causes a very slippery surface)
- snow and/or ice on the tower or falling from it;
- chance of extreme weather such as thunderstorms, hurricanes, typhoons or tornadoes;
- chance of earthquakes;
- potential for violence.

### 7.1.1 Requirements

ALU employees shall not climb towers unless it is absolutely necessary AND the specific safety procedures listed below are in place prior to the climb.

All affected employees shall:

- be trained and certified in the proper and safe procedures for climbing towers, including rescue procedures (see Section 7.3);
- be trained and certified in first aid and cardiopulmonary resuscitation (CPR);
- be provided with, and properly use, the approved tower climbing safety and rescue equipment (including a full-body harness) that is appropriate for the type(s) of tower(s) to be climbed (see Section 7.4);
- be connected 100% to the tower during climbing operations;
- follow all tower climbing safety procedures (see Section 7.6).

A competent person/team leader, responsible for safety and health activities shall be designated for onsite activities.

All subcontractors shall be EHS approved prior to conducting tower climbing work on behalf of Alcatel-Lucent.

Subcontractors shall have a documented tower climbing Procedure and tower climbing set of policies and procedures that will be at least equivalent to those implemented by each Business Unit/ Regional Unit / Country Cluster or organization arranging for tower climbing activities.

Safety measures shall address the presence of employees needing access to the Drop Zone during climbing operations. This must include ALU employees, subcontractors, and other non-ALU workers/individuals at the site. Identification of the drop zone and any restricted access to it shall be included in the Risk Assessment and the Tower Climbing Safety Work Plan.

Access to the drop zone during tower climbing will be determined on a case-by-case basis, and it will be influenced by:

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- the ability to accommodate applicable employees need for access;
- the type of activities taking place during the operation, and
- the ability to implement safety measures intended to prevent injury to personnel gaining access to the drop zone.
- Appendix A “Guide for Working in Drop Zone” should be reviewed prior to assessment

Employees granted access to the drop zone shall comply with any requirements stipulated by the tower climbing crew. Tools/equipment must be tethered and secured when employees are granted access to the drop zone.

Exposure to radio frequency (RF) energy shall be assessed, and adequate control measures shall be implemented to mitigate the risk of exposure.

Location(s) where high-voltage lines and other electrical hazards are present shall be identified and marked.

Any hoisting and rigging shall comply with the local, legal and customer’s requirements.

Appendix B “Manual Rigging and Hoisting”, regarding Materials, Tools and Equipment On Telecommunications Towers, Poles And Other Structures should be reviewed as a Best Practice guide.

### 7.1.2 Guidelines

Refer to additional documents

Appendix A “Guide for Working in Drop Zone” and

Appendix B “Manual Rigging and Hoisting”

## 7.2 Physical and Mental Fitness for Duty

### 7.2.1 Requirements

Tower climbers shall be fit to perform activities related to tower climbing operations.

## 7.2.2 Guidelines

Prior to being trained, all affected employees should be examined by a qualified doctor who will certify, in writing, whether or not the employee is physically capable of safely performing tower climbing activities. The written certification should be addressed to the employee's direct supervisor, who should sign and date it to indicate that he/she has received and read it. It is recommended that medical examinations of certified employees should be conducted at a minimum of every 3-years or when an employee's medical condition changes in such a manner that would adversely affect their ability to work safely on a tower.

## 7.3 Training and Certification

### 7.3.1 Requirements:

There is no internal training or certifications issued for tower climbing activities. All required training shall be conducted and certifications issued by an approved external training company compliant with local laws and/or practices. Contact your local EHS Organization for a list of approved trainers in your country.

Document the minimum training requirements and the frequency of refresher training that staff carrying out tower climbing activities shall undertake.

Training content shall include tower climbing safety and rescue training elements.

The Tower Climbing and Rescue training and certification should:

- include a classroom session, a written examination, and actual climbing and rescue exercises on a real tower in the field similar to the type of tower that employees will encounter during their job;
- Include a personalized and dated certificate for each affected employee that shows they successfully completed the written examination and the field exercises.

All affected employees shall also be trained in first aid and cardiopulmonary resuscitation (CPR) and Bloodborne Pathogens prior to climbing any towers.

### **7.3.2 Guidelines:**

In addition, it is recommended that all affected employees be examined and medically certified as physically capable of climbing towers by a qualified doctor (see Section 7.2). Note that in some countries this is a mandatory requirement.

The Tower Climbing Safety and Rescue Training, provides an example of a set of standards which can be used unless defined by local laws and/or standards.

Affected employees may be permitted to become tower climbing safety and rescue instructors of other employees if they:

- possess strong tower climbing skills;
- have a minimum of 5 years tower climbing experience;
- exhibit strong communications and mentoring skills;
- have successfully completed and are certified in an approved "Train-The-Trainer" tower climbing safety course;
- deliver the entirety of the material of the approved course in the exact same manner in which it was delivered to them;
- are monitored initially and periodically by the EHS Coordinator (or other designated individual) to ensure that the content is comprehensive and delivered in an effective manner ;
- understand and properly communicate Alcatel-Lucent Tower Climbing requirements and local regulatory requirements;
- maintain their instructor skills through continuous education and practice with new tower climbing safety tools and techniques.

All affected employees should practice safe climbing techniques and rescue procedures at a frequency stipulated by the local legal requirements or at least once every two years. Rescue drills must be evaluated and documented by a competent person / team leader. Items identified as requiring improvement shall be corrected prior to resuming tower climbing operations.

## 7.4 Tower Climbing Safety and Rescue Equipment

### 7.4.1 Requirements:

Each certified tower climber shall be provided with suitable work equipment and be trained in its use.

The full list of approved equipment shall be documented.

Equipment required for rescue shall be defined in line with local laws and/or standards, customer requirements and as an output of the risk assessment. The document Tower Safety Equipment Specifications (Appendix D) provides an example of equipment specification which is deemed as best practice.

Components of a fall protection system and the fall protection equipment utilized by employees shall be compatible with one another and shall be utilized in accordance with the manufacturer's recommendations.

All affected employees shall inspect their tower climbing safety and rescue equipment prior to each climb (see Section 7.6.4.1). Tower climbing safety and rescue equipment shall be inspected at least once per year by a competent individual other than the equipment user and the inspection shall be documented. This person must be appointed by the local organization or a qualified manufacturer's representative may be used to perform this inspection.

Whenever tower climbing safety and rescue equipment is determined to be defective, it shall be immediately removed from service, rendered unusable, tagged as "defective" and discarded.

Whenever tower climbing safety and rescue equipment is subjected to impact loading, such as a fall, it shall be immediately removed from service, rendered unusable, tagged as "defective" and retained for inspection.

## 7.4.2 Guidelines:

Each certified tower climber should be provided with the following tower climbing safety equipment, at a minimum, unless local laws, guidelines or training specifies other equipment configurations applicable to different recognized and approved climbing and rescue techniques:

- spreader snap;
- positioning lanyard;
- bypass lanyard;
- carabiners (at least 2);
- dorsal extension;
- appropriately-sized full-body harness;
- anchor strap;
- rope termination plate;
- equipment bag.

## 7.5 Clothing and Personal Protective Equipment (PPE)

### 7.5.1 Requirements:

Each certified tower climber shall be provided with suitable Personal Protective Equipment and be trained in its use. As a minimum this shall include:

- Full body harness with the means to properly attach to the structure
- Hard hat with a chin strap

The full list of approved Personal Protective Equipment shall be documented.

### 7.5.2 Guidelines:

All certified tower climbers should wear the following clothing and personal protective equipment at all times during tower climbing activities at a minimum:

- full body harness with the means to properly attach to the structure, that meets the specifications outlined in Tower Safety Equipment Specifications (Appendix D);
- hard hats with a tether (both on the tower and on the ground when within the designated drop zone);
- gloves that are water resistant, snug, and have good gripping ability;
- shoes with rigid non-slip soles (no sandals or open-heel-shoes);
- safety glasses (tinted safety glasses are recommended when working in bright sunlight);
- long pants and long-sleeved shirts.

Follow the local in country Personal Protective Equipment procedures for the above PPE and any additional PPE that may be required as a result of the work activities to be performed on the tower.

## **7.6 Tower Climbing Safety Procedures**

### **7.6.1 Pre-Climb Risk Assessment, Safety Climbing Work Plan and Emergency Rescue Procedures**

#### **7.6.1.1 Requirements**

Prior to each climb, employees' potential exposure to existing and predictable hazards must be identified, evaluated, controlled and eliminated whenever possible. In order to conduct a proper evaluation of potential hazards, the climbing team shall conduct a Pre-Climb Risk Assessment by:

- initiating a site specific assessment; or
- reviewing an existing Pre-Climb Risk Assessment, if one already exists, and identifying and addressing any additional hazards present at the site.

This assessment shall:



- evaluate new equipment, materials, and processes for hazards before they are introduced into the workplace;
- identify appropriate equipment and tools to be used for the job;
- identify meteorological conditions (such as but not limited to wind, rain, lightning, snow or ice) that could affect work during tower climbing operations;
- identify any existing hazards at the site (List of potential hazards provided in 7.1);
- identify and implement corrective measures.

Prior to each climb, the climbing team shall define safety procedures and emergency response arrangements by:

- developing a Tower Climbing Safety Work Plan and Emergency Rescue Procedures; or
- reviewing an existing Tower Climbing Safety Work Plan and Emergency Rescue Procedures, if one already exists that can be used for the site conditions.

#### **7.6.1.2 Guidelines**

Please review and/or use the Best Practice Template - Appendix C “Risk Assessment / Tower Climbing Work Plan and Emergency / Rescue Plan”.

### **7.6.2 Pre-Climb Safety Meeting**

#### **7.6.2.1 Requirements**

Prior to each climb, the climbing team shall conduct a Pre-Climb Safety meeting with the entire work crew to:

- review results of Risk Assessment (potential hazards and how to deal with them, see Section 7.6.1.1);
- identify appropriate equipment and tools to be used for the job;
- review availability and configuration of rescue equipment
- test communications equipment for proper operation and range;
- plan out the actual climb and identify appropriate anchorage points;

- review rescue and emergency procedures;
- review written, Risk Assessment / Tower Climbing Work Plan and Emergency / Rescue Plan Template (Appendix C). Generic plans can be used as long as they are reviewed for completeness on site and that variations are documented prior to the climb.
- Solicit worker questions and concerns and properly respond to and address any relevant safety issues.

### **7.6.2.2 Guidelines**

Please review and/or use the Best Practice Template - Appendix C “Risk Assessment / Tower Climbing Work Plan and Emergency / Rescue Plan”

## **7.6.3 Pre-Climb Tower Inspection**

### **7.6.3.1 Requirements:**

The designated competent person/team leader shall ensure the tower be inspected prior to each climb. The inspection shall include:

- Inspection of the base of the tower for damage, deterioration, structural deficiencies and functionality of safety features and anchorages;

If any of the following defects are found, the crew shall **NOT** climb the tower until the problem is corrected by a qualified tower construction professional:

- loose structures, missing bolts, broken parts or signs of vandalism;
- cracks, bends, loose connections or metal fatigue;
- rust or buckling due to water freezing in pipe supports;
- guy wires that are broken, frayed or not in tension;
- tower is not plumb (i.e., twisted, crooked or leaning).

### 7.6.3.2 Guidelines

It is recommended that there is evidence the repairs were made prior to work beginning.

## 7.6.4 Pre-Climb Equipment Inspection

### 7.6.4.1 Requirements

The designated competent person/team leader shall ensure that all fall protection equipment is inspected prior to each use for wear, damage, defect or other deterioration.

All certified tower climbers shall inspect their tower climbing safety and rescue equipment prior to each climb. Harnesses, lanyards and accessories with cuts, worn spots, excessive abrasions, material separation or fatigue, or cracks shall be removed from service immediately, rendered unusable, tagged as "defective" and discarded.

When ladder safety systems and related support systems for fixed ladders are utilized, the competent person/team leader shall ensure that the climbers have tested the ladder safety system for proper operation and that all components utilized with the ladder safety system are compatible.

### 7.6.4.2 Guidelines

To perform the test the climbers shall:

- Approach the ladder at the base and connect to the functional safety climb system;
- Climb to a height less than 1.8 meters (6 feet);
- Forcibly engage the device without letting go of the ladder;
- If the device functions as intended, the climbers shall begin their ascent;

- If the device does not function properly, the employee(s) shall immediately descend the structure and shall not utilize the device until it functions properly

**Note:** If a ladder is obstructed, inhibiting the effective use of the ladder safety system, an alternative means of 100% fall protection shall be utilized.

## 7.6.5 Safe Climbing Procedures

### 7.6.5.1 Requirements

Any work at height may be carried out only when the weather conditions do not jeopardize the safety and health of workers.

While climbing, certified tower climbers shall:

- wear an approved full-body harness with the means to properly attach to the structure (see Section 7.4);
- wear appropriate clothing and personal protective equipment (see Section 7.5);
- use the appropriate fall protection system if the tower is equipped with a climbing protection system;
- remain attached to the tower at all times;
- maintain three points of contact with the tower during climbing (i.e., two legs & one hand, or two hands & one leg) at all times;
- maintain 100% fall protection when positioning device systems and their components are used;

Certified tower climbers shall **NOT** climb towers:

- without at least one other certified climber;
- while intoxicated or under the influence of mood-altering drugs (prescription or not);
- during an illness or when suffering from such physical symptoms as dizziness, weakness, abdominal pains, and/or muscle cramps;

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- when precipitation will interfere with the safe performance of assigned tasks;
- during snow, hail, thunderstorms, hurricanes, typhoons, or while tornado warnings are in effect;
- that are covered with ice and/or snow unless it can be removed without endangering the climbers or the people on the ground;
- during periods of high wind 6 beaufort(45 kph, 28 mph) or greater;
- during periods of fog that is dense enough to interfere with the safe performance of assigned tasks.

While climbing, certified tower climbers shall **NOT**:

- allow the lanyard length to permit a free fall greater than 2 meters;
- attach lanyards to coaxial cables, antennas or antenna mounting supports;
- slide lanyards over sharp metal tower members;
- attach tools or equipment to their harness;
- climb, rest or work directly underneath a suspended load.

### 7.6.5.2 Guidelines

- use a bypass lanyard if the tower is not equipped with a climbing protection system;
- visually determine that lanyards are fastened at both ends before climbing;
- install a horizontal lifeline when it is necessary to repeatedly cross an open span by walking on a horizontal tower member;
- inspect for damage, deterioration, structural deficiencies and functionality of safety features and anchorages as the tower is ascended to the elevation point where work will be performed;
- use a separate tool belt to securely attach and carry tools;
- use a rope to raise or lower heavy items (e.g., tools or equipment)
- continually monitor and evaluate weather conditions and communicate any imminent changes to the team leader/competent person.

## 7.6.6 Working at Night

### 7.6.6.1 Requirements

Unless not allowed by local laws/procedures, working on towers at night is permitted if it is not possible to re-schedule the work to during daylight hours **AND** the following measures are taken (in addition to those listed in Section 7.6.5.1):

- all climbers shall maintain contact with each other at all times, and when ground support is provided, maintains radio contact with ground crew at regular intervals;
- the climbing path and the working environment are sufficiently illuminated. **Note:** Sufficiently illuminated means hard shadow-free and glare-free illumination provided by a stationary lighting meeting minimum local/national specified illumination levels when one exists.

### 7.6.6.2 Guidelines

Not applicable

## 8 Measures

Effectiveness of this Procedure will be measured through Site Safety Reviews and/or Corporate EHS Audits of Tower Climbing Operations and the closure of items found in need of improvement. The frequency of Site Safety Reviews will be conducted in line with local requirements.

## 9 Records

Ensure proper documentation / records are maintained in accordance with local laws and regulations and are in compliance with the [Alcatel-Lucent Information Records Management](#) Global Retention Schedule (see tab on IRM site).

The following table is for convenience - current requirements should always be confirmed in IRM before destruction.

Record	Section #	Who Maintains?	How Long?
Medical Examination Report (when applicable)	7.2	Locally designated group/individual in accordance with local company procedures, laws and regulations.	Duration of Employment (per IRM*)
Training Records and/or Employees Climbing Certificates	7.3	Line Manager EHS Coordinator	Duration of Employment (per IRM)
Equipment Procurement Records	7.4	Line Manager	5 years
Risk Assessment/Tower Climbing Safety Plan	7.6.1	Competent Person/Team Leader	2 years

\* refer to IRM for additional details

**End of Document Text**

**APPENDIX A - GUIDE FOR WORKING IN DROP ZONE**

## 1 Scope

All ALU Employees, Contractors and Authorized Visitors (i.e. Customer or Government Representatives), with special attention for those employees executing installation work at the site and within the drop zone.

## 2 Roles and Responsibilities

All employees have the responsibility of adhering to the more stringent safety guidelines at the site, and to comply with all ALU, local, legal and regulatory, and customer requirements.

## 3 Definitions and Acronyms

ALU - Alcatel-Lucent

Drop Zone - is the area into which items dropped from overhead are likely to land. Drop zones are used for determining hard hat areas. The drop zone of a tower while climbers are on the tower, can be determined by measuring the radius out from the tower base, at least one-half of the tower climbers height (e.g., if a climber is up 30.5 meters (100 feet) on the tower, the drop zone is a circle with a 15 meters (50 foot) radius from the base of the tower).

Authorized Visitor - Any individual with a business need to be within the drop zone and that will be allowed to enter to it provided adequate Safety Awareness and PPE have been provided by their Employer.

## 4 Referenced and Supplementary Documents

Section/Appendix	Document Title
------------------	----------------



Section 1.0	Tower Climbing Safety
Section 6.0	Personal Protective Equipment

## 5 Process Flow Diagram

Not applicable

## 6 Work Instruction / Guidelines

### 6.1 North America Requirement

Alcatel-Lucent (ALU) employees shall not work at sites where cellular towers are being erected/ constructed.

### 6.2 General Requirement

Whenever possible, ALU employees shall not work inside the drop zone at a site when tower climbing operations are taking place. Work outside the designated drop zone is permitted.

But if there are real business needs for ALU Employees, Contractors and Authorized Visitors to remain within the drop zone, the Safety Provisions referred to in item 6.3 shall be implemented before entry is cleared.

**DROP ZONE IS THE AREA INTO WHICH ITEMS DROPPED FROM OVERHEAD ARE LIKELY TO LAND. DROP ZONES ARE USED FOR DETERMINING HARD HAT AREAS. THE DROP ZONE OF A TOWER WHILE CLIMBERS ARE ON THE TOWER, CAN BE DETERMINED BY MEASURING THE RADIUS OUT FROM THE TOWER BASE, AT LEAST ONE-HALF OF THE TOWER CLIMBERS HEIGHT (E.G., IF A CLIMBER IS UP 30.5 METERS (100 FEET) ON THE TOWER, THE DROP ZONE IS A CIRCLE WITH A 15 METERS (50 FOOT) RADIUS FROM THE BASE OF THE TOWER).**

### 6.3 Maintenance Activities

When maintenance activities are taking place on the tower, the ALU field operations requiring access to the drop zone **MUST** be postponed or rescheduled unless the job assignment is an emergency and all other conditions listed below are met. To resolve scheduling conflicts contact your Supervisor, Project Manager or the customer's Point of Contact.

If an ALU employee is required to work inside the drop zone (i.e., **emergency situations**) when tower climbing operations are taking place, **ALL** the following conditions **MUST** exist to allow access to the drop zone:

- Their job can't be postponed/rescheduled until after tower climbing operations are complete,
- ALU employees will be working inside the cell hut,
- ALU employees must wear hard hats at all times,
- The Tower Climbing Contractor permits access to the drop zone,
- The Tower Climbing Contractor is able to accommodate ALU employees need for access to the drop zone (Note: The potential to repeatedly exit and reenter a cell hut to use a cellular phone and/or to retrieve additional equipment from the vehicle must be communicated to the contractor),
- ALU employees have complied with all requirements stipulated by the Tower Climbing Contractor in order to enter their drop zone,
- The Tower Climbing Contractor agrees to stop the operation until ALU employees below are in the clear (i.e., inside the cell hut or outside of the drop zone),
- ALU employees get confirmation from the contractor that tools are tethered/secured,
- ALU employees get confirmation from the contractor that all equipment is secured,
- ALU employees get confirmation from the contractor that climbers are connected to the tower 100% of the time,
- and ALU employees have asked themselves if after all listed conditions have been satisfied they believe it is safe to proceed.

## **7 Prior to Work - Contact**

Please contact your EH&S representative and supervisor prior to accessing an area where tower contraction or maintenance activities are being conducted.

## **8 Measures**

Not applicable

## 9 Records

Job records are to comply with the [Alcatel-Lucent Retention Schedule](#) - local, legal and regulatory and contractual customer requirements.

**End of Document Text**

## APPENDIX B - MANUAL RIGGING AND HOISTING

### 1 Purpose

The purpose of this document is to establish the minimum Manual Rigging and Hoisting contents and the Safety Controls for operations that involve manual rigging and /or hoisting of tools, material and equipment on Telecommunications Towers, Poles and other structures. Alcatel-Lucent Operations having the need for adopting or implementing controls for such tasks can either adopt provisions set forth in this document or develop their own localized Procedure based on these provisions.

### 2 Scope

This document sets forth the minimum contents and the safety provisions for rigging and / or hoisting of tools, materials and equipment being lifted on Telecommunications Towers, Poles and other structures and that are being performed by Alcatel-Lucent Technicians and / or by Subcontractors hired by Alcatel-Lucent to deliver Contract commitments with Alcatel-Lucent Customers.

This document does not include Procedure elements for the utilization of cranes or other equipment to lift tools, equipment and material.

### 3. Roles and Responsibilities

**Contractor Supervisor or Crew Chief;** coordinates execution of site tasks with ALU Installation Supervisors; assures that Contractor personnel adhere to established safety rules; addresses any discrepancies/items in need of improvement or concerns identified by ALU Installation Supervisors and/or PMs in regards to -among other matters- Safety.

**EHS Professional or Correspondent;** provides assistance in the identification of EHS Risks in project activities; supports Line Management in the identification and delivery of needed EHS Training and performs site inspections to verify adherence to established Safety Rules.

**Installation Technicians or Authorized Persons (or in some cases Qualified Persons);** follow established rules and maintain consistency in safe work habits. This includes attend to all required training and adequately wear all provided PPE.

**Installations Supervisor;** ensuring that all personnel adhere to established Safety Rules and acts as Site Safety Representative; performs site inspections and initiates action to address any identified gap.

**Roll out Manager;** ensuring that all personnel working in tasks and sites that represent EHS Risks are aware of risks, receive adequate training and PPE and adheres to established Safety Rules.

**Project Manager;** ensuring that Safety Rules are communicated and adhered to by all ALU Employees and Contractor Personnel. This includes assurance of financial means considered in Project IPIS to address these mentioned Safety Rules.

## 4 Definitions and Acronyms

**Authorized Person:** An individual approved or assigned by ALU and / or Contractor to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

**Competent Person:** An individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and who has authorization to take prompt corrective measures to eliminate problems.

**Conductor:** A material, usually in the form of a wire, cable or bus bar, suitable for carrying an electric current.

**Contractor:** An individual or Company hired by Alcatel-Lucent to partner in Contract Delivery Tasks and that is expected to have his/their own safety Procedures concurrent with those of ALU and / or Customer as applicable.

**Crew Chief:** An individual who is authorized, designated, deemed competent and qualified by ALU and / or the Contractor as applicable.

**Drop Zone** is the area into which items dropped from overhead are likely to land. Drop zones are used for determining hard hat areas. The drop zone of a tower while climbers are on the tower, can be determined by measuring the radius out from the tower base, at least one-half of the tower climbers height (e.g., if a climber is up 30.5 meters (100 feet) on the tower, the drop zone is a circle with a 15 meters (50 foot) radius from the base of the tower).

**Gin Pole:** A device attached to the tower used to raise sections of tower steel or equipment into position.

**Maximum Intended Load:** The total load of all tools, materials, equipment, load lines and other loads reasonably anticipated to be applied to the hoist apparatus when these are lifted.

**Qualified Person:** an individual who, by possession of a recognized degree, certificate or professional standing or extensive knowledge, training and / or experience, has successfully demonstrated the ability to prevent and resolve problems relating to the subject matter, the work or the project.

**Rated Capacity of the hoisting equipment:** Is specified in the hoisting equipment load charts provided by the manufacturer, this includes pulleys, lifting ropes (primarily fiber rope), Gin Poles and tools.

**Tagline:** Ropes or lines of durable fiber having sufficient strength and quality to withstand force or tension applied: normally used to control position or guide a suspended load.

**Training;** Before an employee is allowed to perform any job related to hoisting or lifting for tower work, the employee shall receive adequate training on safe practices.

## 5 Referenced and Supplementary Documents

A number of ALU Professionals and external references were consulted and taken into consideration for the development of this document. Nevertheless this document is a standalone reference by itself for ALU Employees and subcontractors to adhere or as a baseline for the development of their own particular concurrent documents.

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## 6 Process Flow Diagram

Not applicable.

## 7 Process/ Procedure/ Work Instruction

These are the mandatory Procedure Elements and their corresponding Safety Provisions that shall be followed when manually rigging and /or hoisting of tools, material and equipment on Telecommunications Towers, Poles and other structures for Alcatel-Lucent.

1. **All Personnel climbing to Towers, Poles and Structures shall be adequately trained and provided with and required to use PPE as per the Tower Climbing Safety Procedure and applicable local and national requirements.**
2. **All equipment and tools to be used for rigging /lifting shall be in good shape and inspected** (inspection is to be documented) prior to each lift. Also Installation/maneuvers crew shall have on hand or be aware of documented rated capacities (and limitations) of hoisting/lifting equipment and tools and make sure that these capacities are consistent with the loads to be hoisted/lifted. Where manufacturers' specifications are not available,



the limitations assigned to the equipment shall be based on the determinations of a registered professional engineer.

3. **Pre Lift Safety Meeting previous to actual maneuvers** shall be attended by the hoist /lifting System Operator (Competent Person), all Crew members (Authorized Persons) and the Crew Chief to address the specific EHS risks associated with the hoist/lift that will be performed;
4. **Trial Lift or Simulation shall be made immediately prior to any other task** in order to identify possible obstacles and risks and to determine that all systems, controls and safety devices are activated and functioning properly. This Trial Lift or Simulation does not need to be performed with actual load; its purpose is to verify that routes, obstacles, risks and controls are adequately addressed.

Visual inspection of the hoist, rigging, ladders, base support and other tools being used shall be made by a competent person immediately after the trial lift to determine whether testing has exposed any defect or adverse effect upon any component of the structure.

5. **Hoisting / Lifting Plan including emergency / rescue procedures.** A Hoisting / Lifting Plan shall be documented with identified Safety Precautions applicable to the specific hoist/lift activity that will be performed.
6. **Isolation and posting of Drop Zone.** A Drop Zone determined for each operation must be established from the radius out from the tower base, and at least one-half of the height where the Crew on the tower will be working. Adequate posting and labeling shall be placed such as yellow/red isolation tape and “Warning, potential for objects falling from heights” labels at visible places along the perimeter of the regulated access area.
7. **Use of Hand lines, Drop lines and Tag lines.** When any work is to be performed on a tower or structure which requires the raising or lowering of materials:
  - a. a hand line shall be carried aloft and securely fastened,
  - b. precaution shall be taken to see that the line does not become entangled or caught by a moving vehicle. Never clip a line to the tool loop or D-ring on a personal fall protection kit,

- c. materials and tools shall not be thrown to employees working aloft, these shall be raised and lowered with a hand line or drop line,
- d. large items being raised or lowered with a hand line shall be tied securely,
- e. small items shall be raised and lowered in a canvas bag,
- f. taglines shall be used to steady and guide hoisted materials around or over crossarms or other protruding construction and as a positive means of control when equipment is being moved near energized apparatus,

**Warning: hand lines and drop lines shall not be suspended from primary or secondary conductors.**

8. **Actual Hoisting / Lifting / Rigging** with at least two Competent Persons in the base, performing the actual Hoisting/lifting/Rigging and two Competent Persons in the Tower/Pole/Structure -properly equipped- that will perform the fixing or servicing maneuvers at the specific site.

If lifting will involve manually carrying of Material, Equipment and Tools by Authorized Persons using carrying equipment, special care shall be put to avoid overloading the carrying equipment.

**Warning: Authorized persons shall never be under a suspended load or in the potential route of equipment being carried during a failure (i.e. in stairs or ramps).**

## 8 Measures

Aim is to complete all these Hoisting / Lifting / Rigging Maneuvers with ZERO Incidents. Effectiveness of this Procedure will be measured through Site Safety Reviews and/or Corporate EHS Audits of Operations involving work in Towers -included lifting / hoisting / rigging materials and equipment- and the closure of action items found in need of improvement. The frequency of Site Safety Reviews will be conducted in line with local requirements.

## 9 Records

- Inspection Logs of Hoisting / Lifting / Rigging Equipment one Inspection Log per equipment per maneuver.
- Manufacturer's specifications for rated capacity of Hoisting / Lifting / Rigging Equipment
- Hoisting / Lifting Plan included emergency / rescue procedures; one per maneuver.

**End of Document Text**

**APPENDIX C -RISK ASSESSMENT / TOWER CLIMBIG WORK PLAN**

LOCATION ADDRESS	TOWER IDENTIFICATION NUMBER	NAME OF COMPETENT PERSON/TEAM LEADER	DATE OF EVALUATION
TYPE OF TOWER <input type="checkbox"/> Self-Support <input type="checkbox"/> Guyed <input type="checkbox"/> Monopole <input type="checkbox"/> Other _____	ACCESS TO WORK AREA <input type="checkbox"/> Fixed Ladder System <input type="checkbox"/> Step Bolts <input type="checkbox"/> Other _____	DESCRIPTION OF WORK TO BE PERFORMED	TOWER HEIGHT WORK HEIGHT

**List of Employees Onsite** (All employees must be certified in tower climbing and rescue. Some of the roles and responsibilities can be done by the same employee.)

Responsibility	Name	Signature
Competent Person / Team Leader		
Ground Support / Designated Rescuer(s)		
Tower Climber(s)		

**Potential Hazards**

Environmental Hazards	<input type="checkbox"/> Sun	<input type="checkbox"/> Rain	<input type="checkbox"/> Snow	<input type="checkbox"/> Heat	<input type="checkbox"/> Cold
	<input type="checkbox"/> Ice	<input type="checkbox"/> Night Work	<input type="checkbox"/> Windy or Gusty	<input type="checkbox"/> Other	<input type="checkbox"/> Non applicable
Physical Hazards	<input type="checkbox"/> No ladder safety system	<input type="checkbox"/> No Step Bolts	<input type="checkbox"/> Climb Path Obstructions	<input type="checkbox"/> Wet or Slippery Surfaces	
	<input type="checkbox"/> Other	<input type="checkbox"/> Non applicable			
Other Recognized Hazards	<input type="checkbox"/> Birds	<input type="checkbox"/> Reptiles	<input type="checkbox"/> Insects	<input type="checkbox"/> Electrical Equipment	
	<input type="checkbox"/> RF Exposure	<input type="checkbox"/> Mechanical Equipment	<input type="checkbox"/> High Crime Area	<input type="checkbox"/> Noise	
	<input type="checkbox"/> Electrical Power Lines	<input type="checkbox"/> Other	<input type="checkbox"/> Non applicable		

**Hazard Controls**

Equipment/supplies available onsite:	First Aid Kit	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Hydration liquid	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Lockout/tagout equipment to de-energize antennas or equipment:	<b>Required</b>			<b>Available</b>			
	<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
RF Radiation Monitoring Device:	<b>Required</b>			<b>Available</b>			
	<input type="checkbox"/> Yes	<input type="checkbox"/> No		<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Have all tower climbing and rescue employees been trained? Training certifications must be checked.						<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Tower Climbing and Rescue	<input type="checkbox"/> First Aid and CPR with Bloodborne Pathogens information						
Has a drop zone of 50% of the height where work will be performed been established/barricaded off?						<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do climber and designated rescuer have appropriate climbing equipment to perform required activities?						<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has equipment and tower base been inspected? Tower base <u>must be</u> inspected by Competent Person prior to any climbing. Tower shall be inspected as it is ascended to the elevation point where work is being performed.						<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has a pre-job briefing been conducted and was it attended by all employees onsite?						<input type="checkbox"/> Yes	<input type="checkbox"/> No
Were the following topics covered during the pre-job briefing?						<input type="checkbox"/> Employees Responsibilities	

<input type="checkbox"/> Hazard Assessments and Work Plan <input type="checkbox"/> Equipment Configuration <input type="checkbox"/> Emergency/Rescue Plan
<b>Tower Climbing Work Plan</b> (All climbers shall be connected 100% of the time while climbing, descending and working on the tower.)
<b>Personal Protective Equipment / Safety Equipment</b> <input type="checkbox"/> Hard Hat with tether <input type="checkbox"/> Safety Glasses <input type="checkbox"/> Fall Protection <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Gloves <input type="checkbox"/> RF Monitors <input type="checkbox"/> Other
<b>Fall Protection to be Used</b> <input type="checkbox"/> Full Body Harness <input type="checkbox"/> Rope Grab <input type="checkbox"/> Horizontal Lifeline <input type="checkbox"/> Vertical Lifeline <input type="checkbox"/> Self Retracting Lifeline <input type="checkbox"/> Descenders <input type="checkbox"/> Bypass Lanyards <input type="checkbox"/> Anchorage Straps <input type="checkbox"/> Fixed Ladder Safety System
<b>Method of Hoisting Used</b> <input type="checkbox"/> Winch <input type="checkbox"/> Block and Tackle <input type="checkbox"/> Capstan <input type="checkbox"/> Manual <input type="checkbox"/> Crane <input type="checkbox"/> Boom Truck <input type="checkbox"/> Other
<b>Other Requirements</b> <input type="checkbox"/> Lift Plan <input type="checkbox"/> Excavation Permit <input type="checkbox"/> Burn Permit <input type="checkbox"/> Other

<b>Equipment Inspection</b>	NO	YES
<b>Is equipment within inspection cycle?                      Indicate next inspection due date:</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Harness inspected and suitable for use? No frayed, torn straps or soft ties,</b> <input type="checkbox"/> No frayed/torn/damaged straps <input type="checkbox"/> No damaged/corroded D-rings <input type="checkbox"/> No damaged /corroded buckles	<input type="checkbox"/>	<input type="checkbox"/>
<b>Lanyards inspected and suitable for use?</b> <input type="checkbox"/> No frayed/torn/damaged straps <input type="checkbox"/> No damaged/corroded D-rings <input type="checkbox"/> Connecting devices working properly	<input type="checkbox"/>	<input type="checkbox"/>
<b>Rope Grab inspected and suitable for use?</b> <input type="checkbox"/> Operating correctly <input type="checkbox"/> No signs of damage/corrosion	<input type="checkbox"/>	<input type="checkbox"/>
<b>Ropes/lifelines inspected and suitable for use?</b> <input type="checkbox"/> Not frayed/torn/damaged <input type="checkbox"/> No signs of mildew	<input type="checkbox"/>	<input type="checkbox"/>
<b>All other components (e.g., carabiners, Fisk Descenders, etc) inspected and suitable for use?</b> <input type="checkbox"/> Operating correctly <input type="checkbox"/> No signs of damage/corrosion	<input type="checkbox"/>	<input type="checkbox"/>
<b>Has any component been subjected to a shock load? WARNING: Any component subjected to a shock load (a fall) shall be removed from service until inspected by the manufacturer and replaced as necessary.</b>	<input type="checkbox"/>	<input type="checkbox"/>

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<p>All equipment must be inspected prior to use. Rescue equipment must be inspected prior to starting tower climbing operations. Employees inspecting equipment must sign below:</p> <p>Climber (s) _____ Date _____</p> <p>Climber (s) _____ Date _____</p> <p>Climber (s) _____ Date _____</p> <p align="center">Print Name / Signature</p>	<input type="checkbox"/>	<input type="checkbox"/>
---	--------------------------	--------------------------

### Tower Climbing Emergency / Rescue Plan

Are cellular phones functional? ( i.e., charged, working signal) <input type="checkbox"/> Yes <input type="checkbox"/> No
If cellular phones are not functional, are other means of communication available? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Radio <input type="checkbox"/> Land Line Phone <input type="checkbox"/> Other _____
Rescue Equipment has been inspected and is available for use. <input type="checkbox"/> Yes <input type="checkbox"/> No
Rescue Procedure: <input type="checkbox"/> Manual <input type="checkbox"/> Outside Services <input type="checkbox"/> Winch <input type="checkbox"/> Ascending/Descending <input type="checkbox"/> Other
Directions to Location:
Designated Rescuer(s) will need additional assistance in the event of a high angle rescue operation. <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please complete the following:
Local Fire/Rescue Department notified of the:
tower climbing operation <input type="checkbox"/> Yes <input type="checkbox"/> No
location of the tower <input type="checkbox"/> Yes <input type="checkbox"/> No
type of tower <input type="checkbox"/> Yes <input type="checkbox"/> No
height climbers will be working at <input type="checkbox"/> Yes <input type="checkbox"/> No
Local Fire/Rescue Department will be able to assist: <input type="checkbox"/> Yes <input type="checkbox"/> No
Predicted Outside Services Response Time:
Ambulance/Paramedics Emergency Phone Number:
Location and Phone Number of closest Medical Facility:
Fire/ Rescue Emergency Phone Number:
Police Emergency Phone Number:
<b>Should a fall occur:</b> All items listed below must be satisfied
<input type="checkbox"/> Local Fire/Rescue Department will be contacted prior to starting rescue procedures.

<input type="checkbox"/>	Employee will be rescued as quickly as possible if able to do so without putting other employees at risk.
<input type="checkbox"/>	Equipment involved in the fall will be taken out of service, tagged with a "Do Not Use" label and retain for evaluation.
<input type="checkbox"/>	EHS representative will be notified of the fall. Name and Phone Number of EHS representative:
<input type="checkbox"/>	An incident/accident report will be completed.

### APPENDIX D - TOWER CLIMBING EQUIPMENT SPECIFICATIONS

The following list is provided for information purposes only. Other equipment may be required to meet specific local climbing needs.

The following specifications (except for Fisk Descender, and Miller Self-Retracting Lifeline) are based on products manufactured by Surety Manufacturing and Testing, LTD for MSA.

For European Union countries all equipment shall have a CE-marking.

#### Anchor Sling

- Steel cable
- Eyes on both ends
- 1.2 m (4 ft)
- 0.4 kg (0.9 lb)

#### Y Shock Absorbing Lanyard/Bypass Lanyard

- Elasticized webbing which expands under tension to 1.8 m (6.0 ft)
- Relaxed state 1.2 m (49 in)
- 3 locking snap hooks with 6.4 centimeter (2 ½ in) opening, drop forged, proof load 2,268 kg (5,000 lb), each weighing 0.65 kg (23 oz)
- Length 244 mm (9 5/8 in)

#### Carabiner

- Steel, auto locking
- 0.3 kg (0.7 lb)

#### Tie-Off Sling

- 4.45 cm (1 3/4 in) nylon web
- Length 45.7 cm (18 in)
- "D" ring stamped 2,268 kg (5000 lb)

**Positioning Lanyard**

- Manual, closed body
- 1.6 cm x 1.8 m
- Sure-D-Braid or Kernmantle rope
- Locking swivel snap hook
- 1.4 kg (3.0 lb)

**Fisk Descender (or equivalent)**

- Stainless steel
- Weight 0.8 kg (1.8 lb)
- Weight Capacity 200 kg (440 lb)

**Full Body Harness - Applicable size**

- Designed for fall arrest, ladder climbing, descent control, positioning and rescue
- Includes a saddle and shoulder padding
- Belt is padded and includes tool loops
- Meets ANSI Z359.1 or equivalent
- Belt and strap - 4.45 cm (1 ¾ in) nylon
- D-rings - drop forged, zinc chromate finish, individually proof loaded to 1630 kg (3600 lb)
- Buckles - quick connect, stamped steel, chromate finish
- Load-bearing box stitch pattern, bonded thread, 18 stitches per cm (7 stitches per in)
- Plastic components resist brittleness down to minus 50 °C (minus 58 °F)
- Minimum web breaking strength 3855 kg (8,500 lb)
- Minimum D-ring breaking strength 2,720 kg (6,000 lb)
- Safe working load 135 kg (300 lb)

**Hand Ascender (Left & Right)**

- Aluminum alloy with steel cam assembly
- Accepts ropes from 7 mm (¼ in) to 12 mm (½ in)
- Strength 11 kN (2500 lb)
- Weight 365 g (13 oz)
- Left/Right



**Sure-Line Horizontal Lifeline System with Tote Bag**

- 10 mm (3/8 in) steel cable lifeline
- Flemish eye splice/steel swaged sleeve
- Adjustable combination clamp and thimble
- Energy absorber
- Captive carabiners
- 18 m (60 ft)
- 8.0 kg (17.7 lb)

**Rope Grab**

- Automatic/manual
- Open body
- 4.4 cm x 0.9 m (1 ¾ in x 3 ft)
- Shock absorber
- Locking snap hook

**Self Retracting Lifeline**

- 2.5 cm (1 in) polyester webbing
- Length 9 m (30 ft)
- Maximum working load 140 kg (310 lb)

**Spreader Snap**

- 2 locking snap hooks with 6.4 cm (2 ½ in) opening
- Drop forged, proof load 2,268 kg (5,000 lb)
- Weight 1.7 kg (50 oz)
- Length 51 cm (20 in)

**Rope Termination Plate**

- Steel
- Breaking Strength 268 kg (5,000 lb)
- 1.56 cm (5/8") diameter for lifeline
- 1.25 cm (½") diameter for descend control line



Carabiner



Anchor sling

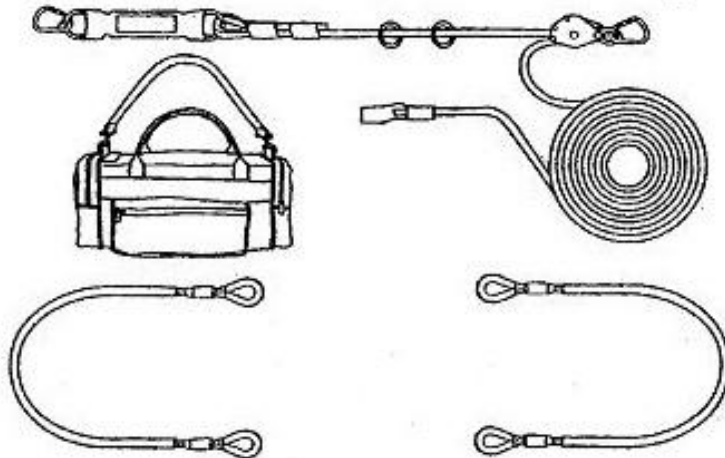


Hand ascender

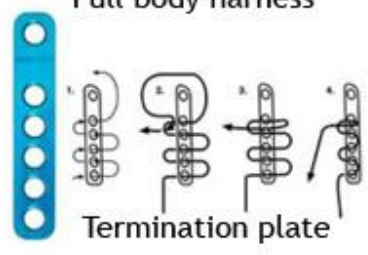
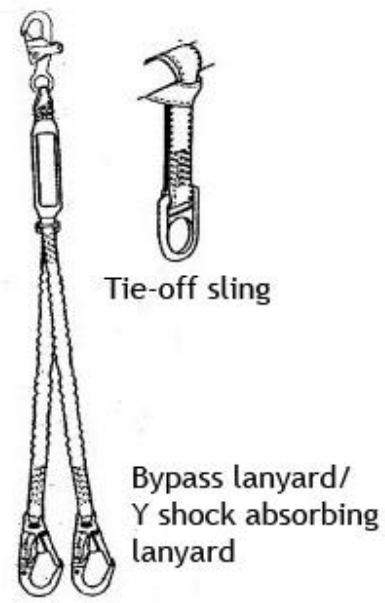


Self retracting lifeline

Synthetic horizontal lifeline with tote bag



Rope grab



**APPENDIX E - TOWER CLIMBING PROCEDURE ASSESSMENT**

**Alcatel-Lucent Tower Climbing - Procedure Assessment**

**Objective** This checklist was designed by the Services EHS Integration Business Team (SEBIT) to assist the user in undertaking a review of their local Tower Climbing Procedure to test the level of alignment with The Alcatel-Lucent tower climbing Procedure (EHS-L2-446-01 TOWER CLIMBING SAFETY PROCEDURE). This checklist will help to identify weaknesses in the local Procedure and develop a remedial plan to ensure full compliance.

**General**      **Country:**  
**Date Completed:**

**Name of Person completing checklist:**

**Background**      **Work performed by:**      **ALU Contractors**                      **ALU Employees**      (circle as appropriate)

**Number of Tower Climbing Contractors:**

**Number of ALU employees climbing towers:**

**Number of ALU employees trained in Tower Climbing Safety & Rescue:**

Number	Tower Climbing Safety Procedure Requirements	Select from drop down menu	Action Taken	Owner	Due Date dd/mm/yy
1	Is the Services Tower Climbing Safety Procedure (EHS-L2-446-01) followed, and if not followed, is a local documented Procedure that meets the requirements sections of the subject Services Tower Climbing Safety Procedure in place and available for review?				
2	Have all deviations from the Services Tower Climbing Safety Procedure been reviewed and approved by the EHS Regional Director				
	<b>Tower Climbing Contractor</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
3	Are contractors approved by the local/regional Supply Chain / Procurement organization?				
4	Is a documented Tower Climbing Procedure available for review, with policies and procedures that at a minimum comply with local and national legal requirements?				

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Edition: 1.0      Effective Date: 15<sup>th</sup> December 2014

	<b>General</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
5	Is a competent person/team leader responsible for safety and health designated for on site activities?				
6	Risk of falling objects. Are safety measures in place that address the need of employees to access the drop zone during climbing and/or rigging operations?				
7	Is exposure to radio frequency (RF) energy assessed, and adequate control measures implemented to mitigate the risk of exposure?				
8	When location(s) where high-voltage lines and other electrical hazards are present, are these locations identified and marked?				
9	In situations where antennae are located on High Voltage pylons, are persons working in and around pylons trained to do so?				
10	Is hoisting and rigging carried out according to local and national legal requirements? (Reference: EHSMS-L4-446-01)				
	<b>Physical and Mental Fitness for Duty</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
11	Are tower climbers medically assessed to ensure they are fit to perform activities related to tower climbing operations?				
	<b>Training</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
12	Does Tower Climbing training include tower climbing safety from an approved and recognized training source?				
13	Does Tower Climbing training include rescue procedures from an approved and recognized training source?				
14	Does training include Cardio Pulmonary Resuscitation (CPR) from an approved and recognized training source?				

15	Does training include First Aid procedures from an approved and recognized training source?				
	<b>Equipment</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
16	Is the full list of approved equipment documented and available for review?				
17	Are the components of the fall protection system and equipment compatible with one another and utilized in accordance with the manufacturer's recommendations?				
18	Is tower climbing safety and rescue equipment inspected by each user prior to each climb?				
19	Is equipment inspected at least once per year by a competent individual or manufacturer's representative (other than the equipment user)?				
20	Is the inspection documented and available for review?				
21	Is defective equipment removed from service immediately, rendered unusable, tagged as "defective" and discarded?				
22	When equipment is subjected to impact loading (such as a fall), is it immediately removed from service, rendered unusable, tagged as "defective" and only returned to service following inspection and testing?				
	<b>Clothing and Personal Protective Equipment</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
23	Are certified tower climbers provided with suitable personal protective equipment (PPE) which at a minimum shall include full body harness with shock absorbing lanyards that provide the means to properly attach to the structure and a hard hat with a chin strap?				

	<b>Pre-Climb Risk Assessment</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
24	Are Pre-Climb Risk Assessments undertaken?				
25	Does the risk assessment meet the following minimum criteria? - evaluates new equipment, materials, and processes for hazards before they are introduced into the workplace; - identifies appropriate equipment and tools to be used for the job; - identifies meteorological conditions (such as but not limited to wind, rain, lightning, snow or ice) that could affect work during tower climbing operations; - identifies any existing hazards at the site; - identifies and implement corrective measures.				
26	Prior to each climb, does the climbing team meet to define safety procedures and emergency response arrangements?				
	<b>Pre-Climb Tower Inspection</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
27	Is the tower inspected by a competent person prior to each climb? (Inspection to include the base of the tower for damage, deterioration, structural deficiencies and functionality of safety features and anchorages.)				
28	In the event of finding defects, is the crew instructed not to climb the tower until the problem is corrected by a qualified tower construction professional? Examples of defects: - loose structures, missing bolts, broken parts or signs of vandalism; cracks, bends, loose connections or metal fatigue; rust or buckling due to water freezing in pipe supports; guy wires that are broken, frayed or not in tension; tower is not plumb (i.e., twisted, crooked or leaning).				
	<b>Pre-Climb Equipment Inspection</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>

29	Does the designated competent person/team leader ensure that all fall protection equipment is inspected by the certified climbers prior to each use for wear, damage, defect or other deterioration?				
30	In the situation where ladder safety systems and related support systems for fixed ladders are utilized, does the competent person/team leader ensure that the climbers have tested the ladder safety system for proper operation and that all components utilized with the ladder safety system are compatible?				
	<b>Safe Climbing Procedures</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
31	Is there a requirement that any work at height is only carried out when the weather conditions do not jeopardize the safety and health of workers?				
32	Are climbers required to comply with all of the following? <b>While climbing, certified tower climbers:</b> wear an approved full-body harness with shock absorbing lanyards that provide the means to properly attach to the structure; wear appropriate clothing and personal protective equipment; use the appropriate fall protection system if the tower is equipped with a climbing protection system; remain attached to the tower at all times; maintain three points of contact with the tower during climbing (i.e., two legs & one hand, or two hands & one leg) at all times; maintain 100% fall protection when positioning device systems and their components are used.				
33	Is climbing by a certified climber forbidden when any of the following conditions exist? <b>Conditions:</b> without at least one other certified climber; while intoxicated or under the influence of mood-altering drugs (prescription or not); during an illness or when suffering from such physical symptoms as dizziness, weakness, abdominal pains, and/or muscle cramps; when precipitation will interfere with the safe performance of assigned tasks; during snow, hail, thunderstorms, hurricanes, typhoons, or while tornado warnings are in effect; when the tower is covered with ice and/or snow unless it can be removed without endangering the climbers or the people on the ground; during periods of wind 6 beaufort(45 kph, 28 mph) or greater and during periods of fog that is dense				



	enough to interfere with the safe performance of assigned tasks.				
34	<p>Do certified tower climbers observe the following?</p> <ul style="list-style-type: none"> <li>- DO NOT allow the lanyard length to permit a free fall greater than 2 meters;</li> <li>- DO NOT attach lanyards to coaxial cables, antennas or antenna mounting supports;</li> <li>- DO NOT slide lanyards over sharp metal tower members;</li> <li>- DO NOT attach tools or equipment to their harness;</li> <li>- DO NOT climb, rest or work directly underneath a suspended load</li> </ul>				
	<b>Working at Night</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>
35	<p>Is working on towers at night only undertaken when: it is not possible to re-schedule the work to daylight hours, it is allowed by local laws/procedures, AND the additional measures listed below are taken?</p> <ul style="list-style-type: none"> <li>- all climbers maintain contact with each other at all times, and when ground support is provided, maintains radio contact with ground crew at regular intervals;</li> <li>- the climbing path and the working environment are sufficiently illuminated.</li> </ul> <p>Note: Sufficiently illuminated means hard shadow-free and glare-free illumination provided by a stationary lighting meeting minimum local/national specified illumination levels when one exists.</p>				
	<b>Measures</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>	<b>Due Date dd/mm/yy</b>

36	Are Site Safety Reviews conducted to evaluate effectiveness of the local Tower Climbing Operations and items found to be in need of improvement are tracked until closure?			
	<b>Records</b>	<b>Select from drop down menu</b>	<b>Action Taken</b>	<b>Owner</b>
37	Is proper documentation for the following records maintained in accordance with local laws and regulations? Medical Records, Credentials of Training Provider, Training Records, Certifications, Equipment Procurement Records and Risk Assessment/Tower Climbing Safety Plan			<b>Due Date dd/mm/yy</b>

**NOTE: Some documentation may be requested for review.**



**Yes**  
**No**  
**Partially Only**  
**Not Applicable**

**Yes**  
**No**  
**Partially Only**  
**Not Applicable**