

Communications Tower



INTRODUCTION



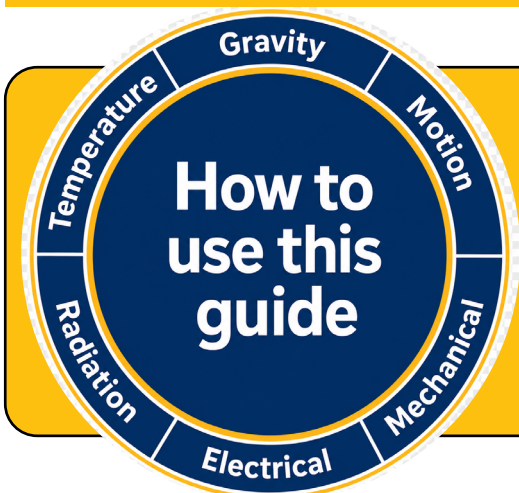
Communications towers support wireless, broadband, broadcast, and emergency communications systems. Building, inspecting, repairing, and maintaining these structures exposes workers to some of the most serious hazards in construction.

Tower work often involves multiple employers, contractors, and subcontractors on the same site, so organizations must clearly define and communicate safety responsibilities before work begins.

Falls remain the leading cause of fatalities, but tower workers also face struck-by incidents, structural failures, electrical hazards, radio frequency (RF) energy, severe weather, and delayed emergency response at remote sites.

Many serious incidents occur when crews do not identify hazards, plan the work carefully, or maintain effective controls throughout the job.

This guide uses an energy-based approach to hazard recognition. Instead of listing every possible hazard, it groups hazards by the type of energy that can injure workers. Once crews learn to recognize these energy sources, they can identify hazards on almost any tower site — even hazards this guide does not specifically mention. This approach aligns with industry resources, such as NATE, the non-profit Communications Infrastructure Contractors Association, which publishes an [Energy Wheel Guide](#) to support energy-based hazard recognition in tower and communications infrastructure work.



- Use it as the basis for a toolbox talk or new-hire orientation.
- Cover one energy category per safety meeting instead of all six at once.
- Walk the jobsite and ask the crew to point out where each energy source shows up that day.
- Use the discussion questions near the end to get the crew talking about hazards specific to the site.

Plan before you climb



Planning tip:

Never start work until the crew has reviewed the JHA and emergency procedures.

Safe tower work begins before the crew arrives on site.

Before any employee starts work, the employer should complete a site-specific **Job Hazard Analysis** (JHA) for the job and use it to identify the tasks involved, the hazards associated with each task, and the controls needed to prevent injuries.

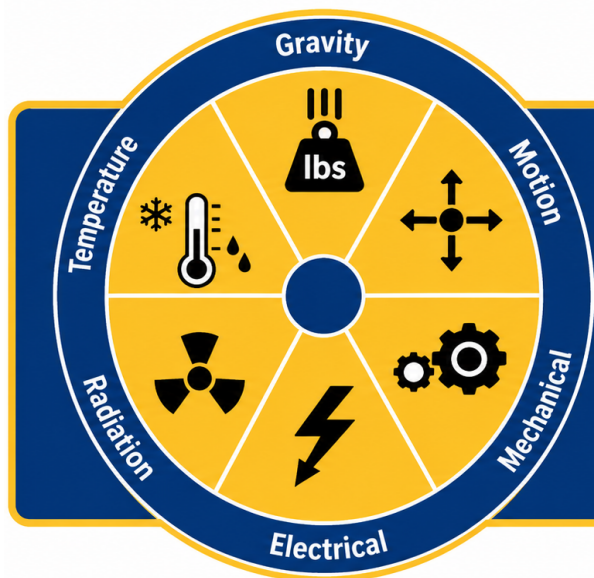
A preplanned JHA for routine tower tasks may be used as a starting point, but it should be reviewed and revised for the job to reflect the actual site conditions, tower type, work scope, equipment, crew, weather, access, and any co-located operations. The finalized JHA should be available on site and should be updated whenever conditions change.

At the start of each workday, hold a tailgate safety meeting to review the JHA with the crew, confirm the day's hazards and controls, discuss emergency procedures, and make sure no new conditions affect the work. Stop work and reassess if site conditions, equipment, weather, or the work plans change.

Before climbing:

- Review the JHA and confirm that it reflects current site conditions.
- Inspect the tower, access route, and surrounding work area.
- Identify fall, electrical, RF, weather, rigging, and dropped-object hazards.
- Inspect fall-protection, rigging, rescue, and communication equipment.
- Make sure a competent person is on site to oversee the work.
- Review emergency procedures, rescue roles, site location, and the route to the nearest hospital.
- Stop work if conditions change or new hazards appear.





ENERGY WHEEL

Six sources of hazardous energy



1. Gravity: Falls from height.¹

Gravity creates a serious hazard on every tower site. Workers climb hundreds of feet above the ground, often while carrying tools or installing equipment. Wet steel, damaged personal protective equipment (PPE), poorly maintained fall-protection equipment, or failure to maintain 100% tie-off can quickly lead to a fatal fall.

Common hazards on a tower site.

- Failing to maintain 100% tie-off or using unapproved anchor points.
- Using a defective harness, lanyard, snap hook, or carabiner.
- Working on ice-covered or wet steel.
- Standing near an unprotected floor opening or hatch.

Protect yourself.

- Maintain 100% tie-off whenever climbing or working at height.
- Inspect harnesses, lanyards, and connectors before every climb, and remove damaged gear from service immediately.
- Use engineered anchor points rated for fall arrest.
- Train and certify climbers before they climb.
- Never climb without a site-specific rescue plan.

Safety tip:

A fall can leave a worker suspended in a harness within seconds. Make sure rescue equipment and trained rescuers remain on site before anyone climbs.

¹ Employers must provide and ensure the use of effective fall protection consistent with applicable OSHA requirements ([29 CFR 1910 Subpart D](#) and [29 CFR 1926 Subpart M](#)), and the guidance outlined in OSHA's Communication Tower Best Practices ([OSHA 3877](#)).



2. Motion: Stuck-by and caught-in.²

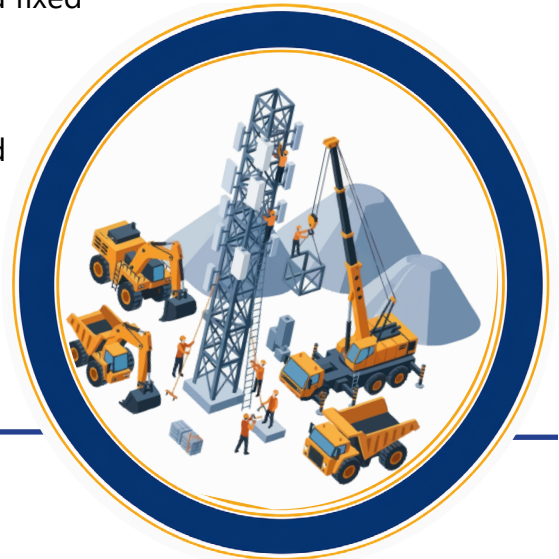
Tower sites contain many moving hazards, including cranes, gin poles, hoists, vehicles, suspended loads, and falling tools. Ground workers remain especially vulnerable to dropped objects.

Common hazards on a tower site.

- Falling tools or hardware striking a worker below.
- Hoisted loads swinging into a climber.
- Delivery or service vehicles backing into an active work zone.
- Riggers caught between a moving load and a fixed structure.

Protect yourself.

- Mark a drop zone beneath all aerial work and keep ground personnel out of it.
- Tether tools and use bucket or hand-line systems to prevent dropped objects.
- Use trained signal persons or spotters as needed for vehicle and crane movement.
- Never work beneath another.



3. Mechanical energy: Rigging, hoisting, and structural hazards.³

Tower work relies heavily on rigging and hoisting equipment. Equipment failures, overloaded rigging, or damaged structural components can release tremendous force without warning.

Common hazards on a tower site.

- Rigging failure from an overloaded or damaged sling.
- Improperly secured gin poles.
- Frayed or overloaded hoist lines.
- Corroded or damaged structural components.
- Unapproved or unsecured tower modifications.
- Pinch points.

Protect yourself.

- Inspect rigging and hoisting equipment before each use and remove damaged gear from service.
- Never exceed rigging or hoisting equipment load capacity ratings.
- Verify the tower can safely support the planned work.
- Keep hands clear of pinch points.
- Stop work immediately if you suspect structural damage.

² See OSHA [29 CFR 1926 Subpart CC](#) (Cranes and Derricks in Construction) and [29 CFR 1926.601](#) (Motor Vehicles) for more information.

³ See OSHA [29 CFR 1926.251](#) (Rigging Equipment for Material Handling) for more information.



4. Electrical energy: Shock and arc flash.⁴

Tower crews often work around energized electrical equipment, generators, batteries, temporary power systems, and nearby overhead power lines. Contact with electricity can cause serious injury or death.

Common hazards on a tower site.

- Contact with overhead power lines.
- Using damaged extension cords or power tools.
- Working near an unlabeled or unlocked electrical panel.
- Improper lockout procedures on energized equipment.

Protect yourself.

- Identify all nearby power lines and other electrical hazards before work begins.
- Maintain safe distances from energized power lines.
- De-energize and lock out equipment before servicing it when possible.
- Inspect electrical cords and tools before each use.
- Ground portable generators properly.



5. Radio frequency (RF) energy: Overexposure hazards.⁵

Communication towers often contain antennas that transmit RF energy. Excessive exposure to RF energy can heat and damage body tissue and may interfere with some implanted medical devices. Confirm RF conditions before climbing and follow site controls to keep exposures within safe limits.

Common hazards on a tower site.

- Working near energized antennas.
- Entering restricted RF areas.
- Climbing without confirming RF status.
- Working in a high-power RF environment without a personal RF monitor.

Protect yourself.

- Confirm RF conditions before climbing.
- Request power-down or reduced power from the site owner or carrier before climbing near antennas when required by the site RF assessment or work plan.
- Use a personal RF monitor in high-power environments.
- Follow site-specific RF warning signs and access restrictions.
- Know your employer's RF safety procedures and follow them.

⁴ See OSHA [29 CFR 1926 Subpart K](#) (Electrical) and NFPA [70E](#) (Electrical Work Practices) for more information.

⁵ OSHA has no RF-specific exposure standard, but requires employers to protect workers from recognized hazards under the [General Duty Clause, Section 5\(a\)\(1\)](#). FCC RF exposure limits ([47 CFR 1.1310](#)) govern maximum permissible exposure at tower sites.



6. Environmental energy: Heat, cold, weather, and fatigue.⁶

Outdoor work exposes tower crews to changing weather conditions. Heat, cold, wind, lightning, and fatigue can reduce alertness and increase the risk of mistakes while working at height.

Common hazards on a tower site.

- Heat exhaustion or heat stroke during a summer climb.
- Hypothermia during winter tower work.
- Continuing to work as high winds, thunderstorms, and lightning approach.
- Fatigue and long travel days.

Protect yourself.

- Monitor weather throughout the workday.
- Leave the tower immediately when lightning threatens.
- Drink water and take scheduled rest breaks.
- Allow workers time to acclimate to hot weather.
- Watch for signs of hypothermia in winter and warm up immediately.
- Never climb when illness, fatigue, or medications reduce your ability to work safely.

Prepare for an emergency

Every tower job should include a site-specific rescue plan. Remote locations and tower height can delay emergency responders, so crews should prepare to begin a rescue immediately.

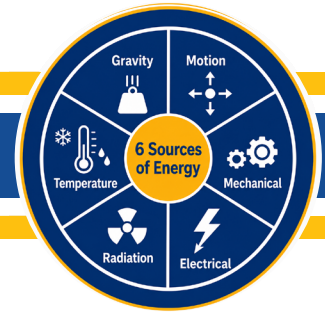
Before work begins:

- Review rescue procedures.
- Identify trained rescuers.
- Inspect rescue equipment.
- Confirm the location, directions, and fastest route to the nearest hospital.
- Test communication equipment.
- Assign emergency responsibilities before climbing.



⁶ OSHA enforces heat protections through the [General Duty Clause](#) and a renewed National Emphasis Program on heat hazards, effective April 2025 ([CPL 03-00-024](#)).

Putting it into practice



BEFORE YOU CLIMB: QUICK-REFERENCE CHECKLIST

- ☐ Complete the Job Hazard Analysis.
- ☐ Hold a tailgate safety meeting.
- ☐ Inspect fall-protection equipment.
- ☐ Inspect rigging and hoisting equipment.
- ☐ Confirm tower structural integrity.
- ☐ Verify RF conditions.
- ☐ Identify electrical hazards.
- ☐ Check the weather forecast.
- ☐ Review the rescue plan.
- ☐ Make sure every crew member understands today's hazards and responsibilities.



QUESTIONS FOR YOUR NEXT SAFETY MEETING

- Which source of hazardous energy presents the greatest risk on today's job?
- What hazards could change during today's work?
- What would cause us to stop work immediately?
- Does everyone know today's rescue procedures?
- Has everyone inspected their equipment before climbing?
- Are we protecting workers below from dropped objects?



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