

NFPA® 1670

Standard on

Operations and Training for Technical Search and Rescue Incidents

20XX Edition

TOWER RESCUE

Things to Add to Chapter 3 Definitions

Chapter TR - Tower Rescue

TR.1 Prerequisites

TR.1.1 The requirements of this chapter shall apply to organizations that provide varying degrees of response to emergencies involving lattice-type tower structures. It may also be used as a guide for response to non-standard of tower structures such as water towers, concrete towers, silos, flare stacks, radar structures, wooden poles, or portable towers.

TR.1.2 Organizations operating at Tower Rescue incidents shall, as a prerequisite, meet the requirements specified in Chapter 4.

TR.1.3 Each member of the rescue service shall be certified at least to the level of first responder or equivalent according to U.S. Department of Transportation (DOT) First Responder Guidelines.

TR.1.4 Each member of the rescue service shall successfully complete a course in cardiopulmonary resuscitation (CPR) taught through a recognized course of study.

TR.1.5 The AHJ, as part of its hazard identification and risk assessment (*see 4.2.2*), shall identify all locations and situations in the jurisdiction that meet the definition of *Towers* And shall make reasonable effort to pre-plan with the tower owner, manager, operator, or other AH J for potential town emergencies.

TR.2 General Requirements.

TR.2.1 The rescue service shall be capable of responding in a timely manner to rescue summons.

TR.2.2 Each member of the rescue service shall be equipped, trained, and capable of functioning to perform tower rescues within the area for which they are responsible at their designated level of competency.

TR.2.2.1 Any member who ascends a tower in the course of a rescue must be protected from a potential fall with equipment and methods that provide protection that is at least equivalent to the protection that might be expected for a worker on the same tower.

TR.2.2.2 Each member of the rescue service shall be provided with, and trained to use properly, the PPE and rescue equipment necessary for performing rescue from towers according at the designated level of competency.

TR. 2.23 Personnel responding to tower incidents in remote or Wilderness environments should also meet at least Operations level requirements of this document.

TR.2.3 Each member of the rescue service shall be aware of the hazards he or she could confront when called on to perform rescue within towers for which the service is responsible.

TR.2.3.1 Each member of the tower rescue service shall be trained at the level of an authorized tower climber, in accordance with standard industry practice (ie, ANSI A10.48, Section 7).

TR.2.3.2 Each member of the Tower Rescue service shall be trained to avoid and protect against hazards involved with RF radiation and Electrical Hazards.

TR. 2.3.3 Any member of the rescue service that works in a position where they may be exposed to RF radiation shall be equipped with and carry on their person an RF monitor.

TR.2.4 Each member of the rescue service shall practice performing tower rescues at least once every 12 months, by means of simulated rescue operations in which he or she removes dummies, mannequins, or persons from actual towers or representative structures resembling the type(s), configuration(s), and accessibility of towers which the rescue service could be required to respond in an emergency within their jurisdiction.

TR. 4 Awareness Level.

TR.4 Organizations operating at the awareness level for tower rescue incidents shall meet the requirements specified in Sections TR.2 and 5.2 (awareness level for rope rescue).

TR.4.1 Members of organizations at the awareness level shall be permitted to assist in support functions on a tower rescue operation but shall not be deployed onto the tower.

TR.4.1.2 Organizations at the awareness level may be responsible for performing certain non-entry rescue (retrieval) operations.

TR.4.4 Organizations operating at the awareness level for tower rescue incidents shall implement procedures for the following:

- (1) Recognizing the need for tower rescue
- (2) Initiating contact and establishing communications with a subject(s) where possible
- (3) Initiating the emergency response system for tower rescue
- (4)* Recognizing different types of towers
- (5)* Performing a nonentry retrieval
- (6)* Implementing the emergency response system for tower emergencies
- (7)* Initiating site control and scene management
- (8) Recognizing and identifying the hazards associated with tower emergencies
- (9) Recognizing the limitations of conventional emergency response skills and equipment in various tower environments

- (10) Initiating the collection and recording of information necessary to assist operational personnel in a tower rescue
- (11) Identifying and isolating any reporting parties and witnesses

TR.5 Operations Level.

TR.5.1 Organizations operating at the operations level for tower rescue incidents shall meet the requirements specified in Sections TR.2, TR.3, TR.4, and 6.3 (operations level for rope rescue).

TR.5.2 The organization operating at this level shall be responsible for the development and training of a tower rescue team who are trained, equipped, and available to respond to tower emergencies of a type and complexity where all of the present are true:

- (1) A climbing ladder and/or integrated tower safety system is present, and rescuers can access the subject using available PPE and accepted tower climbing techniques.
- (2) The tower is not structurally compromised
- (3) The site is not contaminated by other hazards
- (4) The climb path is not obstructed
- (5) A Rescue pre-plan exists for that particular tower site and advance preparation/planning has been performed with the Tower owner/operator.
- (6) The subject can be safely reached and evacuation performed in accordance with the preplan in such a manner so as to avoid additional hazards, entanglement, or restrictions to the rescue effort.
- (7) The tower can accommodate two or more rescuers in addition to the victim.
- (8) All hazards in and around the tower have been identified, isolated, and controlled.
- (9) Use of appropriate subject extrication/packaging devices is feasible.

TR.5.3 Organizations operating at the operations level shall ensure that at least two individuals who are trained and Capable of ensuring an Operations Level response are available to respond to a tower incident at any given time, and shall develop and implement procedures for the following:

- (1)* Sizing up existing and potential conditions at tower incident sites
- (2) Protecting personnel from hazards on and around the tower environment
- (3) Ensuring that personnel are capable of managing the physical and psychological challenges that affect rescuers accessing and climbing towers
- (4) *Performing ongoing assessment of conditions affecting the tower rescue operation.
- (5) *Requesting and interfacing with specialized resources applicable to tower safety
- (6) Placing a team of two rescuers on a tower where existing ladder or step bolts and climb protection is present, using accepted tower safety methods and procedures.
- (7) Performing basic rescue techniques with two rescuers on the tower
 - a) releasing a subject from fall protection
 - b) lowering a subject vertically down an unobstructed path
 - c) performing a guide-line rescue of a subject
- (8) Appropriate selection, care, and use of personal tower climbing equipment

- (9) Procuring the necessary tower-site information, including owner and lessor information, site plan, and specific hazard information.
- (10) Modifying actions and urgency as applicable to a rescue versus a recovery
- (11) Acquiring information on current and forecast weather, including temperature, precipitation, lightning potential, and winds
- (12) Recognizing, identifying, and utilizing typical fall protection and safety hardware and software used by tower climbers
- (13) *Recognizing the team's limitations regarding accessing and/or evacuating a Subject
- (14) Development of and adherence to contingency plans for when weather or other factors make Operations level response ineffective.

TR. 6 Technician Level.

TR.6.1 Organizations operating at the technician level shall be capable of performing and supervising all aspects of any tower rescue operation with which the organization could become involved.

TR.6.1.1 Organizations operating at the Technician level for tower rescue emergencies shall meet all of the requirements of this chapter plus the requirements of chapter 6.4 (Technician Level for Rope Rescue) of this document.

TR.6.2* The organization operating at this level shall be responsible for the development of a tower rescue team of at least four individuals who are trained, equipped, and available to respond to tower emergencies of a type and complexity that requires a technician level organization, including where any one or more of the following conditions exist:

- (1) A climbing ladder or climbing pegs are not present
- (2) An integrated tower safety system is not present
- (3) The tower is structurally compromised
- (4) The site is contaminated by other hazards
- (5) The climb path is obstructed
- (6) A Rescue Pre-Plan either does not exist, has been compromised, is infeasible, and/or is not sufficient to resolve the problem at hand.
- (7) The tower cannot accommodate more than one rescuer in addition to the victim.
- (8) Use of standard subject extrication/packaging devices, systems, and/or procedures is infeasible.
- (9) The capabilities of operations-level skills are exceeded.

TR.6.3 Organizations operating at the technician level for tower rescue emergencies shall be capable of developing and implementing procedures for the following:

- (1) Evaluating hazards and establishing a climb plan for an unfamiliar tower
- (2) Isolating and controlling electrical hazards on an unfamiliar tower
- (3) Identifying and controlling RF hazards on an unfamiliar tower
- (4) Effectively assessing available non-standard anchorages on different types of

Towers for climbing and rescue use

- (5) Planning and implementing response for entry-type tower rescues on unfamiliar towers
- (6) Placing at least one rescuer on the tower without the benefit of a ladder, step bolts, or integrated fall protection
- (7) Performing basic rescue techniques, including at least the following, with only one rescuer on the tower
 - a) releasing a subject from common types of fall protection including a Vertical Lifeline (cable); Vertical Lifeline (rope); fall arrest lanyard; and SRL
 - b) lowering a subject vertically down an obstructed path
 - c) performing a rescue where the subject must be moved horizontally as well as vertically

Annex A Explanatory Material

A.TR.2.2 Training should address the process of achieving and maintaining control of the site and the perimeter. This control might include management of all civilian and nonemergency personnel and establishment of operational zones and site security.

A.TR.2.3 Hazards associated with tower rescue operations can vary widely depending on the type and purpose of the tower, age & structural integrity of the tower, location of the tower, environmental conditions, and other factors.. The AHJ should consider the following potential hazards and, to help provide for their safety, ensure that members have the ability to recognize potential hazards that they can encounter.

- (1) *Type of structure:* towers maybe freestanding or guyed. In either case, condition of all connections, including foundation and anchor point(s) are key to safety. Rescuers should be trained to examine the tower for any condition(s) that might compromise it's structural integrity.
- (2) *Environmental Hazards.* Depending on the specific environment, there are many dangers that pose hazards to responders. Responders may be exposed to such things as Personnel should be made aware of hazards including, but not limited to, insect bites and stings, poisonous plants, exposure injuries (cold and heat), lightning, sunburn, dangerous wildlife, and so forth. Special care should be taken when responding to

towers in remote or wilderness locations.

(3) *Purpose of Tower.* Towers may be used to support communications equipment, electrical lines, or other things. Responders should pay special attention to what equipment the tower supports and what specific additional hazard may exist as a result.

A.TR.2.31 Conventional emergency response PPE and other equipment (especially fire-related equipment) are often inappropriate for use in a tower rescue. For instance, fire helmets, turnout (bunker gear), structural firefighting gloves, and structural firefighting boots can decrease one's safety and increase one's potential for injury on a tower. Equipment for this type of response should be considered and selected specifically to provide appropriate protection on a tower.

A.TR. 5.3 (1) The size-up should include, but not be limited to, the initial and continuous evaluation of the following:

- (1) Scope and magnitude of the incident, including whether it is a rescue, or body recovery
- (2) Assessment of time required
- (3) Assessment of staffing needs
- (4) Specific environmental factors involved
- (5) Integrity and stability of the environment involved
- (6) Number of known/potential victims
- (7) Weather (current and forecast)
- (8) Urgency (based on the type of known/potential victims)
- (9) Available/necessary resources
- (10) Information about the physical and mental status of the Subject, including whether the Subject is Authorized to be on the tower.

A.TR.5.3.4 Ongoing assessment of hazards should be performed during the course of the rescue. Changing conditions can have a profound effect on hazards such as corrosion, foundation, fasteners, anchor bolts, grounding, guy wires, weep holes. In addition, RF and electrical hazards can change over time. **A.TR. 5. 3(5)** Resources can include but are not limited to the following:

- (1) Tower owners/operators
- (2) Installed equipment owners/operators
- (3) Helicopter short haul rescue resources
- (4) Crane equipment (5) Rope rescue specialists
- (6) RF/ Electrical hazard specialists
- (7) Trench rescue specialists
- (8) Vehicle/machinery rescue specialists
- (9) Tower maintenance companies/ Technicians (10) Emergency incident management (overhead) teams
- (11)

A.TR.5.4(7) It is reasonably foreseeable that some conditions and/or situations will exceed the Operations capability of the organization. In anticipation of such situations, a plan should be devised in advance for procurement of additional, more experienced, specialized, or highly

trained resources.

A.TR.5.4(13) The ability to discern limitations in accessing and/or evacuating should be based on the following:

- (1) Individual and team expertise
- (2) Qualified personnel available
- (3) Ability to communicate from the patient scene
- (4) Anticipated staffing and time

A.TR.6.1 Members of an organization at the technician level should be adept and experienced at every skill required of subordinate personnel. Technician-level organizations should have the capability to address any potential operation that falls within their jurisdiction. To accomplish this, members of these organizations should be personally adept at wilderness skills, travel, and operations in the wilderness setting.

A.TR.6.3 Such an operational plan should be based on the hazard identification and risk assessment performed according to Section 4.2, available resources, environmental influences and conditions, and the urgency of the situation. The implemented plan should involve planning techniques including, but not necessarily limited to, the following:

- (1) Determining the urgency of the search
- (2) Developing a subject profile
- (3) (4) Designing, developing, and establishing appropriate rescue strategy and tactics
- (9) Considering the effects of prolonged suspension on both subject and rescuer(s)
- (10) Demobilizing personnel and facilities
- (11) Documenting the incident properly