

Tower Rescue

Lesson One

Incident Planning for Tower Rescue

DOMAIN: AFFECTIVE / PSYCHOMOTOR

LEVEL OF LEARNING: COMPREHENSION / APPLICATION

MATERIALS

Classroom; computer, projector; screen; whiteboard or equivalent; Highline Productions, Tower Rescue for Emergency Responders.

TERMINAL OBJECTIVE

The tower rescue candidate when given an exam shall demonstrate knowledge in identifying types of towers and their associated dangers, basic understanding of tower construction, access, minimum rescuer qualifications, and understand planning components for tower rescues.

ENABLING OBJECTIVES

1. The tower rescue candidate when given an exam shall demonstrate knowledge in the minimum qualifications of tower rescuers.
2. The tower rescue candidate when given an exam shall demonstrate knowledge of general towers.
3. The tower rescue candidate when given an exam shall demonstrate knowledge of Radio Transmission towers.
4. The tower rescue candidate when given an exam shall demonstrate knowledge of High Voltage Power Transmission towers.

5. The tower rescue candidate when given an exam shall demonstrate knowledge in identifying different tower styles.
6. The tower rescue candidate when given an exam shall demonstrate knowledge of identifying tower components that may fail.
7. The tower rescue candidate when given an exam shall demonstrate knowledge of tower access considerations.
8. The tower rescue candidate when given an exam shall demonstrate knowledge of case histories of injuries and deaths related to tower workers.
9. The tower rescue candidate when given an exam shall demonstrate knowledge in tower risk assessment.
10. The tower rescue candidate when given an exam shall demonstrate knowledge in performing a tower climbing exposure assessment.
11. The tower rescue candidate when given an exam shall demonstrate knowledge of tower rescues outside the scope of emergency responder's capabilities.
12. The tower rescue candidate when given an exam shall demonstrate knowledge in the importance of a tailgate meeting with the tower owner or representative.
13. The tower rescue candidate when given an exam shall demonstrate knowledge of performing a proper incident planning session for a tower rescue.

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MOTIVATION

Tower Rescue? What's the big deal? We often underestimate the potential for tower emergencies to happen in our own jurisdiction. As with any type of potential incident, emergency responders need to be prepared for every type of call for help. Tower rescue is a unique type of rescue requiring specially trained personnel. The tower rescuer must be able to identify different types of towers, their unique construction, dangers associated with each type, and understand how to successfully plan for a tower rescue.

PRESENTATION

ENABLING OBJECTIVE #1

The tower rescue candidate when given an exam shall demonstrate knowledge in the minimum qualifications of tower rescuers.

1. The tower rescue candidate should meet the following qualifications before performing as a tower rescuer:
 - a. North Carolina Certified Technical Rescuer (ERT or Rescue Technician).
 - b. Completed North Carolina Fire and Rescue Commission 1006, Ch 6 ropes, 2003 or 2008 edition Technical Rescue Ropes.
 - c. Completion of specialized training in the area of tower rescue.

PRESENTATION

ENABLING OBJECTIVE #2

The tower rescue candidate when given an exam shall demonstrate knowledge of general towers.

1. Point out that general towers are towers with a height of 125' or less.
2. Point out that over 99% of all towers in America fall into this height category.
3. Define Combination towers (Radio & Electric)
4. Discuss general tower construction.
 - a) Metal "Lattice" type
 - b) Metal "Monotube" poles or towers
5. Discuss general tower access.
 - a. Lacing only
 - b. Removable step fins
 - c. Step bolts
 - d. Removable ladder sections
 - e. Ladders with and without fall protection.
 - f. Enclosed ladders or platforms.

Reference: Tower Rescue for Emergency Responders, pages 95 – 99.

PRESENTATION

ENABLING OBJECTIVE #3

The tower rescue candidate when given an exam shall demonstrate knowledge of Radio Transmission towers.

1. Define Radio Frequency "RF"
 - a. A frequency well above the visible light spectrum and is basically in between 50,000 hertz and 38,000,000 hertz.
2. Discuss why radio towers produce more traffic therefore more potential for a rescue.
3. Discuss the dangers of microwave beams.
4. Discuss why it is essential to talk with the tower owner or engineer before sending anyone up the tower.

5. Point out that utility companies often provide employee training in utility line rescue.

Reference: Tower Rescue for Emergency Responders, pages 100 - 103.

PRESENTATION

ENABLING OBJECTIVE #4

The tower rescue candidate when given an exam shall demonstrate knowledge of High Voltage Power Transmission towers.

1. Stress the need for additional education before rescuers should attempt rescue on High Voltage Power Transmission towers.
2. Rescues on this type of tower should be done in conjunction with utility workers in the area.
3. Briefly discuss the following in relation to high voltage power transmission towers:
 - a. Alternating and Direct Current lines
 - b. Circuits on each tower
 - c. Shield wires
 - d. Groundings
 - e. Types of Transmission Tower Structures
 - f. Insulators
 - g. Electromagnetic Field (EMF)
 - h. Conductor Arcing Distance to Ground
 - i. Power Lines and Moisture
 - j. Determining the Minimum Approach Distance Calculations
 - k. Insulator Configurations

Reference: Tower Rescue for Emergency Responders, pages 102 – 118.

PRESENTATION

ENABLING OBJECTIVE #5

The tower rescue candidate when given an exam shall demonstrate knowledge in identifying different tower categories and styles.

1. Discuss the following styles of towers:
 - a. Normal towers.
 - b. Aesthetically pleasing towers.
 - c. Buildings as towers.
 - d. Energy towers.
 - e. Water towers.

2. Describe and discuss the three general categories of transmission structures found with transmission lines.
 - a. Tangent Towers
 - b. Tangent angle towers
 - c. Dead end towers

Reference: Tower Rescue for Emergency Responders, page 108, 109.

PRESENTATION

ENABLING OBJECTIVE #6

The tower rescue candidate when given an exam shall demonstrate knowledge of identifying tower components that may fail.

1. Discuss the following items that may fail on a tower requiring personnel to climb the tower:
 - a. Structural failure
 - b. Electrical components
 - c. Lighting components
 - d. Routine maintenance
 - e. Retrofitting of tower

PRESENTATION

ENABLING OBJECTIVE #7

The tower rescue candidate when given an exam shall demonstrate knowledge of tower access considerations.

1. Discuss how towers are normally owned by one company but may lease space to numerous different companies.

2. Discuss how cell towers and radio towers are commonly fenced in, however power towers normally

only have the bottom steps removed to detour trespassers.

PRESENTATION

ENABLING OBJECTIVE #8

The tower rescue candidate when given an exam shall demonstrate knowledge of case histories of injuries and deaths related to tower workers.

1. Discuss what can go wrong, will go wrong!
2. Discuss the following tower related injuries and deaths:
 - a. Thomasville Tower 2/9/06
 - b. Wake Forrest Tower 4/12/08
 - c. Frisco Tower 4/17/08
 - d. Morganton Tower 6/6/07
 - e. Onslow Co. Tower 11/4/09
 - f. New Hampshire Water Tower 8/7/09

PRESENTATION

ENABLING OBJECTIVE #9

The tower rescue candidate when given an exam shall demonstrate knowledge in tower risk assessment.

1. Explain the following elements of a proper tower risk assessment:
 - a. No Risk
 - b. Low Risk
 - c. Moderate Risk
 - d. High Risk
 - e. Extreme Risk
2. Explain the following elements of a Rapid Risk Assessment:
 - a. Number of eyes on the rigging.
 - b. Duration of rescue operation.
 - c. Exposure of falling.

Reference: Tower Rescue for Emergency Responders, pages 29-32.

PRESENTATION

ENABLING OBJECTIVE #10

The tower rescue candidate when given an exam shall demonstrate knowledge in performing a tower climbing exposure assessment.

1. Discuss the following exposure assessment classifications:
 - d. Low climbing exposures
 - e. Medium climbing exposures
 - f. High climbing exposures
2. Discuss “center of gravity” and how it affects the rescuer.

Reference: Tower Rescue for Emergency Responders, pages 29-38.

PRESENTATION

ENABLING OBJECTIVE #11

The tower rescue candidate when given an exam shall demonstrate knowledge of tower rescues outside the scope of emergency responder’s capabilities.

1. Discuss how some situations are beyond the rescuer’s training and experience.
2. Discuss live line bare hand potential rescues, and how power companies should provide the rescue expertise for this type of rescue.
3. Emergency responders should rely on power companies and tower owners to disconnect all power supply before beginning rescue operations.

Reference: Tower Rescue for Emergency Responders, page 39.

PRESENTATION

ENABLING OBJECTIVE #12

The tower rescue candidate when given an exam shall demonstrate knowledge in the importance of a tailgate meeting with the tower owner or representative.

1. Define the purpose of the tailgate meeting.
2. Discuss the importance of having the owner or representative present on scene.

Reference: Tower Rescue for Emergency Responders, pages 40.

PRESENTATION

ENABLING OBJECTIVE #13

The tower rescue candidate when given an exam shall demonstrate knowledge of performing a proper incident planning session for a tower rescue.

1. Lead the class through an incident planning session for the following tower rescue incidents:
 - a. Victim clinging from ladder.
 - b. Victim suspended between tower supports.
 - c. Victim suspended over 300' on a tower.

Application

1. Break the students into small groups and give each group different scenario. Ask them to perform an incident planning session and then present their plan to the class.
2. Each plan should consist of the following as a minimum:
 - a. Identify IC.
 - b. Establish a safety officer.
 - c. Tower risk assessment. (Stability, energized, etc.)
 - d. Topography and surrounding exposures/obstacles.
 - e. Identify if it's a body recovery or rescue.
 - f. Plan what rescue technique will be used.
 - g. Plan an alternate rescue plan if the primary plan does not work.
 - h. Identify rescuers and assignments.
 - i. Identify equipment needed to safely perform rescue.
 - j. Identify and establish communications.

Summary

Tower rescue brings its own unique challenges to the rescue world. Tower rescuers must understand the uniqueness of this type of rescue operation and make concessions to guarantee rescuer safety.

Planning for the tower rescue is no easy task. The tower rescuer must be proficient in performing risk assessment to ensure safety for all responders. Proactive planning is essential to the success of tower rescues. You do not want to meet tower owners for the first time on a tower rescue.