TOWER SAFETY & AVVARENESS

SHACOG TECHNICAL RESCUE TEAM

BACKGROUND

- What is the South Hills Area Council of Governments
 - 22 Municipalities
 - 300K+ Population Base
 - 220+ square miles
 - Career and Volunteer Public Safety Agencies (40+ Fire and EMS Agencies)
- Technical Rescue Team Founded 2008
- 2015 Rescue Service of the Year
- 3 hams on the team

OBJECTIVES

- Common Tower Type Overview
- General Hazards / Safety
- Proper Personal Protective Equipment
- Climbing Preparations / Proper climbing Technique
- Ground Personnel
- Types of Emergencies / What to do in case of Emergency

WHY ARE WE HERE?

- Tower Climbing is a High Risk Low Frequency Event from a rescue stand point
 - High Consequence + Low Margin for Error
 - Tower Climbing is not something any particular amateur is doing "every" day
- Lee Parsons III (N3LPJ) was killed in 2019 during a tower installation project
 - http://www.arrl.org/news/pennsylvania-radio-amateur-dies-in-tower-installation-mishap
- Rescues are challenging and can be labor intensive depending

FATALITY RATES: COMMERCIAL VS AMATEUR*

Commercial

- Est 300K commercial towers in US
- 5.2K FTE workers: 10,360,000 hours
- Deaths
 - 93 from '03-'11 (9 years)
 - 10.3 deaths per year
- 199 deaths / 100K FTE Workers / Year

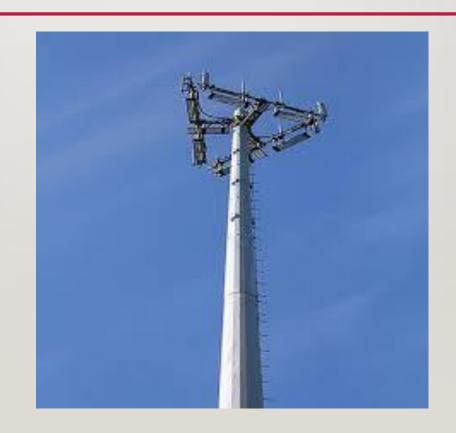
Amateur

- Est 38K Amateur towers in US
- 24 hours / tower / year
- Est 456 FTE climbers: 912,000 hours
- Deaths
 - 4 in 12 months ('18-'19) (17 since 2000)
- 878 deaths / 100K FTE Workers / Year

^{*}Data was taken second hand from Jim Idelson Presentation which sourced the data from OSHA and PBS Frontline Pro-Publica

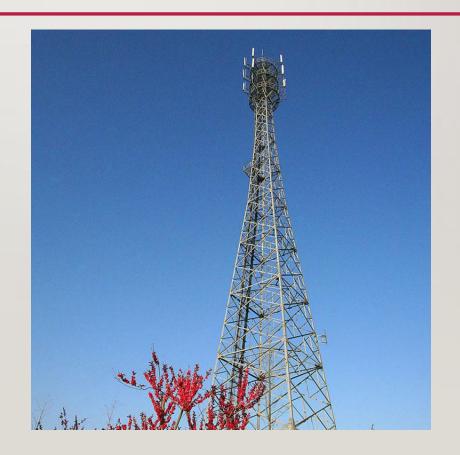
COMMON TOWER TYPES: MONOPOLE

- Single Tube Structure
- Multi-Section
- 100-200 ft
- Hard to climb
- Difficult for rescue due to structure
- Limited Access



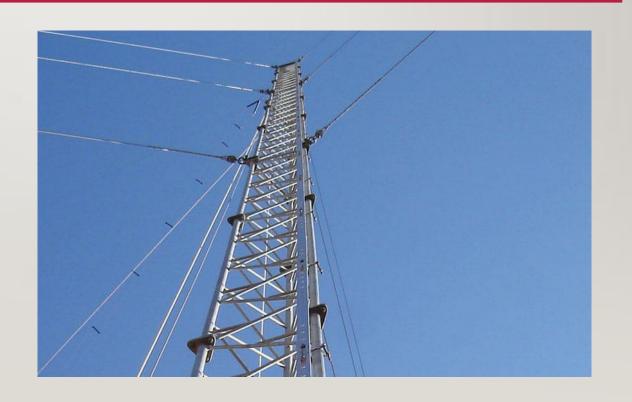
COMMON TOWER TYPES: SELF-SUPPORTED

- Triangular or Square Base
- Often Tapered
- 200-400 ft
- One leg typically has an integrated safety system in commercial
- Easiest of towers to climb and work on



COMMON TOWER TYPES: GUYED

- Rise from a single point
- Supported by guy wires
- Can reach in excess of 2000' feet
- Most common in amateur radio
- Rescue may be complex based on height.



COMMON HAZARDS

- Falls
- RF Exposure

| Physical | Cognitive |
|--|---------------------------------------|
| Fatigue, Chills, Dizziness, Burning | Uncertainty, Confusion, Concentration |
| Sensation, Extremity Tingling, Unusual | Loss, Memory, Poor Attention/Problem- |
| Thirst | Solving |

- Electrical
 - https://hackaday.com/2020/04/16/a-dangerous-demonstration-of-the-power-of-radio/

PROPER PERSONAL PROTECTIVE EQUIPMENT

- Helmet
- Eye Protection
- Gloves
- Fall Protection Harness
- Positioning
- "Good" footwear
- ARRL Handbook (2013 ed.) has fairly limited information on this topic

- OHSA 1926.502(d)(21)Personal fall arrest systems SHALL be inspected prior to each use for wear, damage, and other deterioration, and defective components SHALL be removed from service.
- 6.1 Inspection6.1.1 Equipment SHALL be inspected by the user before each use and, additionally, by a competent person other than the user at intervals of no more than one year.
- https://falltech.com/training-education/fallprotection-topics-videos/

100% ATTACHED + FALL ARREST

- 100% attached means that you are always connected to the tower by something other than your hands/feet.
- This isn't a guideline; It's a NON-NEGOTIABLE Requirement
- Fall Arrest reduces potential of major injuries

- Proper Dual Fall Arrest Lanyard
 Technique
- Bad Example from DX Engineering

PREPARATIONS BEFORE CLIMBING

Climber

- DON'T CLIMB ALONE
- Dress for Success
 - Proper PPE
 - Proper clothing for weather
 - Sunscreen
 - Pre-Use Inspection of PPE
- Have a Plan What is going to be done, how is it going to be done.

Ground Support Person(s)

- I. Tower Climber is in Charge
- Don't do anything unless directed by climber
- 3. PACE Plan
- 4. ABCDEFG

Anchors, Bodywear, Connection, Devices, Edge Protection, Force Check, Good to Go

EMERGENCIES!

- Climber Illness/Medical Emergency
 - Anaphylaxis
- Fall of a Climber
 - Suspension Trauma
- Equipment Misuse or Malfunction
- Trespasser/Unauthorized Access

Information to Gather

- l) Reason for Response
- 2) Type of Tower
- 3) Height of Patient and Height of Tower
- 4) Patient Contact / Level of Consciousness
- 5) Secured to Structure
- 6) Known Medical Conditions
- 7) Known Hazards

WHAT IS SUSPENSION TRAUMA?



WHAT YOU CAN DO TO HELP!

Stop the Bleed

CPR

Call 911

- Bleeding Control Direct Pressure
- Bleeding Control Wound Packing
- Bleeding Control Tourniquet

ADDITIONAL INFORMATION AND SOURCES

- SHACOG Website: https://www.shacog.com
- Elevated Safety: https://elevatedsafety.com/
- ARRL:
 - http://www.arrl.org/news/new-england-radio-amateur-hosts-video-on-tower-safety
 - ARRL Handbook Chapter on Safety (Chapter 28 2013 Ed.)
- Zero Falls Alliance: https://zerofalls.org/
- The Driven Element: https://blog.thedrivenelement.com/
- Text Resources Available:
 - https://www.arrl.org/shop/Antenna-Towers-for-Radio-Amateurs/
 - https://www.championradio.com/UP-THE-TOWER-The-Complete-Guide-To-Tower-Construction. Construction. I
 - ARRL September 2021 QST Magazine