

RIGHT TREE-RIGHT PLACE

Trees and Power lines



Mike Robinson JEA Forester

Don't Let This Be You!!!



How we get electricity to the homes



Begins at the Generating Stations,....

How we get electricity to the homes



....moved through high-voltage transmission lines
at 69Kv to 500Kv ,....

How we get electricity to the homes



... to substations that lower voltages down to
household levels then.....

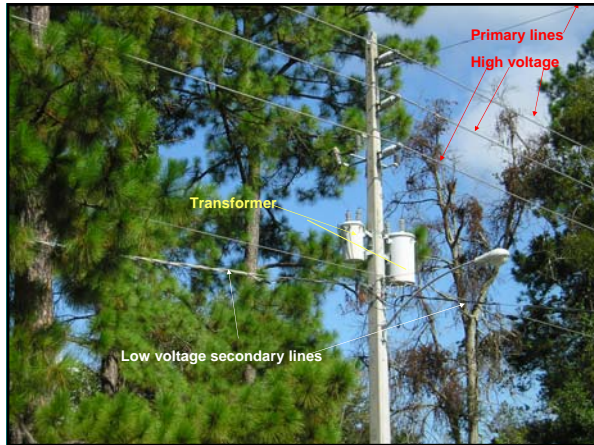
How we get electricity to the homes

.....there it is sent out through distribution lines.



Terminology

- Secondary Voltage - 120 V - 750 V
- Primary Voltage- 2 Kv - 50 Kv
- Transmission Voltage- 69Kv -500Kv
- Working Clearance - Applies to Qualified
- Minimum Approach Distance - Applies to Unqualified





Qualified vs. Unqualified "Line Clearance Tree Trimmers"

An employee who is **regularly assigned** to a line-clearance tree-trimming crew and who is **undergoing on-the-job training** and who, in the course of such training, has **demonstrated an ability to perform duties safely** at his or her level of training and who is **under the direct supervision of a line-clearance tree trimmer** is considered to be a **line-clearance tree trimmer for the performance of those duties**.

A line-clearance tree trimmer **is not considered to be a "qualified employee"** under this section **unless he or she has the training required** for a qualified employee under paragraph (a)(2)(i) of this section. However, under the electrical safety-related work practices standard in Subpart S of this Part, a line-clearance tree trimmer is considered to be a "qualified employee". Tree trimming performed by such "qualified employees" is not subject to the electrical safety-related work practice requirements contained in 1910.331 through 1910.335 of this Part. (See also the note following 1910.332(b)(3) of this Part for information regarding the training an employee must have to be considered a qualified employee under 1910.331 through 1910.335 of this part.)

Source: 29CFR1910.269

ANSI Z133.1-2006

Table 1 - Minimum working distances to energized conductors for persons as **qualified** line-clearance tree trimmers and **qualified** line-clearance tree trimmer trainees

| Nominal voltage kV phase to phase | Includes 1910.269 elevation factor, sea level to 5000 ft (1) ft/m | | Includes 1910.269 elevation factor, 5001-10,000 ft (1) ft/m | | Includes 1910.269 elevation factor, 10,001-14,000ft (1) ft/m | |
|-----------------------------------|---|------|---|------|--|-------|
| | Avoid contact | | Avoid contact | | Avoid contact | |
| 0.05 - 0.3 | 1-01 | 0.33 | 1-03 | 0.38 | 1-04 | 0.41 |
| 0.301-0.75 | 2-05 | 0.70 | 2-08 | 0.81 | 2-10 | 0.86 |
| 0.751-15.0 | 3-00 | 0.91 | 3-02 | 0.97 | 3-05 | 1.04 |
| 15.1 - 36.0 | 3-00 | 0.91 | 3-05 | 1.04 | 3-09 | 1.14 |
| 36.1 - 46.0 | 3-04 | 1.01 | 4-03 | 1.30 | 4-07 | 1.40 |
| 46.1 - 72.5 | 4-02 | 1.26 | 5-02 | 1.58 | 5-07 | 1.70 |
| 72.6 - 121.0 | 4-06 | 1.37 | 5-11 | 1.80 | 6-05 | 1.96 |
| 121.1 - 145.0 | 5-02 | 1.58 | 6-10 | 2.08 | 7-05 | 2.26 |
| 145.1 - 169.0 | 6-00 | 1.83 | 9-00 | 2.75 | 9-09 | 2.97 |
| 169.1 - 242.0 | 7-11 | 2.41 | 15-00 | 4.58 | 16-03 | 4.96 |
| 242.1 - 362.0 | 13-02 | 4.02 | 21-09 | 6.63 | 23-06 | 7.17 |
| 362.1 - 550.0 | 19-00 | 5.80 | 31-03 | 9.53 | 33-10 | 10.32 |
| 550.1 - 800.0 | 27-04 | 8.34 | | | | |

(1) Exceeds phase-to-ground, elevation factor per 29 CFR, 1910.269

ANSI Z133.1- 2000

Table 2 - Minimum Approach distances to energized conductors for persons **other than** qualified line-clearance tree trimmers and **qualified** line-clearance tree trimmer trainees

| Nominal voltage kV phase to phase | Distance |
|-----------------------------------|----------|
| | ft-in |
| 0.0 - 1.0 | 10-00 |
| 1.1 - 15.0 | 10-00 |
| 15.1 - 36.0 | 10-00 |
| 36.0 - 50.0 | 10-00 |
| 50.1 - 72.5 | 10-09 |
| 72.6 - 121.0 | 12-04 |
| 121.1 - 145.0 | 13-02 |
| 145.1 - 169.0 | 14-00 |
| 169.1 - 242.0 | 16-05 |
| 242.1 - 362.0 | 20-05 |
| 362.1 - 550.0 | 26-08 |
| 550.1 - 800.0 | 35-00 |

Qualified Personnel



Unqualified Personnel



Right Tree, Right Place

- ❖ Normally think of overhead utilities
- ❖ Concern for underground utilities
"Out of Sight, Out of Mind"
- ❖ FL law requires call to "811" before digging
- ❖ Locates done within 48 hrs.

Right Tree- Right Place

The 2012 Florida Statutes Title XI
COUNTY ORGANIZATION AND INTERGOVERNMENTAL RELATIONS
Chapter 163 INTERGOVERNMENTAL PROGRAMS

163.3209 Electric transmission and distribution line right-of-way maintenance
—After a right-of-way for any electric transmission or distribution line has been established and constructed, no local government shall require or apply any permits or other approvals or code provisions for or related to vegetation maintenance and tree pruning or trimming within the established right-of-way.....
...Prior to conducting scheduled routine vegetation maintenance and tree pruning or trimming activities within an established right-of-way, the utility shall providea **minimum of 5 business days' advance notice**.....
...Vegetation maintenance and tree pruning or trimming conducted by utilities **shall conform to ANSI A300 (Part 1)—2001 pruning standards and ANSI Z133.1-2006 Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush—Safety Requirements**....
...Vegetation maintenance and tree pruning or trimming... **must be supervised by qualified** ...personnel...trained to conduct vegetation maintenance and tree trimming or pruning consistent with this section or by Certified Arborists certified by the Certification Program of the International Society of Arboriculture.....
...**A local government shall not adopt an ordinance or land development regulation that requires the planting of a tree or other vegetation that will achieve a height greater than 14 feet** in an established electric utility right-of-way.....
...This section **does not supersede** local government ordinances or regulations governing planting, pruning, trimming, or removal of **significant trees or historical trees**, as defined in a local government's ordinances or regulations, or trees within **designated canopy protection areas**....
...This section shall not apply if a local government...adopts a written plan specifically for vegetation maintenance...by the utility...provided, however, such a plan **shall not require the removal** of a tree or other vegetation that will achieve a height **greater than 14 feet** in an established electric right-of-way.

163.3208 Substation approval process.—

- (1) It is the intent of the Legislature to maintain, encourage, and ensure adequate and reliable electric infrastructure in the state. It is essential that electric infrastructure be constructed and maintained in various locations in order to ensure the efficient and reliable delivery of electric service.....
- (2) Electric substations are a critical component of electric transmission and distribution. Local governments may adopt and enforce reasonable land development regulations for new distribution electric substations addressing only setback, landscaping, buffering, screening, lighting, and other aesthetic compatibility-based standards. **Designated buffers or screening beneath aerial access points to the substation equipment shall not be required to have a mature height in excess of 14 feet.**

Jacksonville Ordinance Code

- **Sec. 656.1211. - Florida-Friendly Landscape and Irrigation design standards**
- Plants with similar water and cultivation requirements (soil, climate, sun and light) shall be grouped together and irrigated according to their water requirements.
- (b)
- **Trees shall not be placed where they interfere with site drainage or where they shall require frequent pruning in order to avoid interference with overhead power lines. Unless otherwise provided in this Section, a minimum number of trees shall be planted or preserved upon each site, pursuant to the following standards which are the minimum requirements for landscaping within the City of Jacksonville.**

Jacksonville Ordinance Code

- **Sec. 656.1215. - Perimeter landscaping**
- (3)
- No less than one tree, located within 25 feet of the street right-of-way, for each 50 linear feet, or fraction thereof, of VUA street frontage. The trees may be clustered, but shall be no more than 75 feet apart. At least 50 percent of the trees shall be shade trees. **If an overhead power line abuts the street frontage, then the required trees reaching a mature height greater than 25 feet shall be located at least 20 feet away from the power line;**

Jacksonville Ordinance Code

- **Sec. 656.1223. - JEA Neighborhood Below Ground Pump Stations.**
- (a)
 - Landscape Performance Standards The visual impacts of the below ground pump stations sites shall be mitigated through the use of a landscaping buffer outside the security fence. The buffer shall be a minimum 5' at the street frontage and a minimum of 10' on all other sides and subject to and consisting of the following:
 - (1) A row of shade trees, beginning at the halfway point along each side fence and across the back, with no trees allowed in the front of the pump station, planted a minimum of 25' on center. At the time of planting, the trees shall be a minimum 10' tall with a 2" caliper; and
 - (2) A row of evergreen shrubs such as viburnum, ligustrum, holly or juniper, or any other evergreen shrub permitted by Section 656.1223, a minimum of 3' tall at time of planting, planted at 3' on center; and
 - (3) A 6' tall privacy fence with black vinyl privacy slats and a minimum 10' wide privacy gate; and
 - (4) The required landscaping shall be properly maintained through an irrigation system with rain sensor.
 - (b) Deviations from the standards in subsection (a) must be reviewed and approved by JEA and by the City's Landscape Architect.
- (Ord. 2008-910-E, § 1)

Palms and Power Lines



Unique growth form and habit

Not as big a problem in North FL

New growth is from bud inside top

Palms and Power Lines



Palms and Power Lines



- Can trim for a period
Eventually have to cut
the bud
Need 1.5X frond length
for safety

New Federal Rules for Utilities

Result of 2003 Northeast US blackout



BEFORE



AFTER

All utilities must develop TVMP
Subject to **HUGE** fines for violations

Federal Rules



Specific Rule- NERC Standard
FAC-003-1

Applies to Transmission lines
only (*right now*)

Voltages of 200Kv and above

Thought is to extend down to
100 KV

TVMP

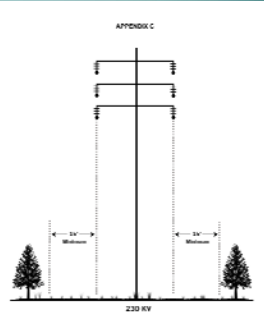
- **T**ransmission **V**egetation **M**anagement **P**lan
- Normal conditions AND heavy load
- Must account for line sag and sway
- Utility sets minimum clearance standards
- Each utility is audited by NERC

TVMP

- Clearance 1- where vegetation is maintained
- Clearance 2- minimum clearance at any time.

JEA's TVMP

- No vegetation taller than 8' under conductors
- 15' clearance from any vegetation (Clearance 1)
- Clearance 2 is 5.2 feet



Safe Reliable Electric Service

- Reliability
- Cost
- Restriction Compliance
- Accessibility
- Minimizing Fire Hazards

The 16 foot Rule

- The NESC clearances are designed to protect people. They account for the intrusion made on the site by people.
- Roads, streets, and other areas subject to truck traffic.
- Driveways, parking lots, and alleys.
- Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc.
- The operative word here is Vehicle.

Objectives

Keep a safety zone around electric conductors.

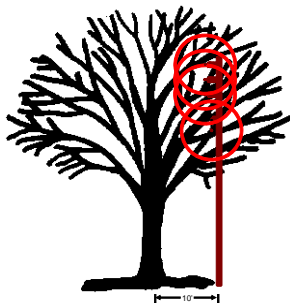
Protect life, limb, or property.

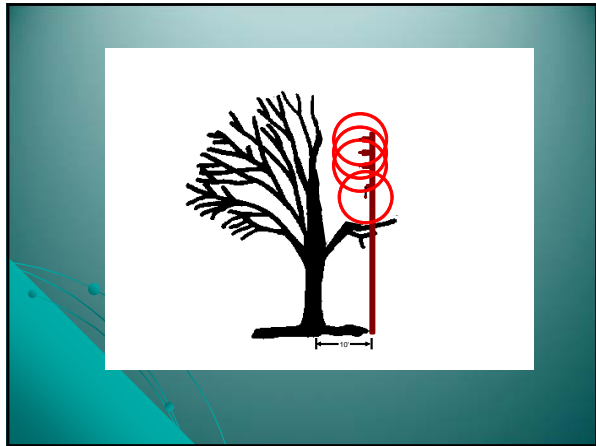
Fire hazard

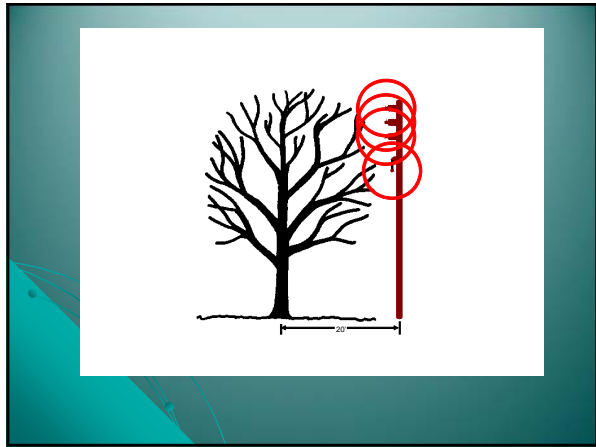
Can be a life or death situation for some folks

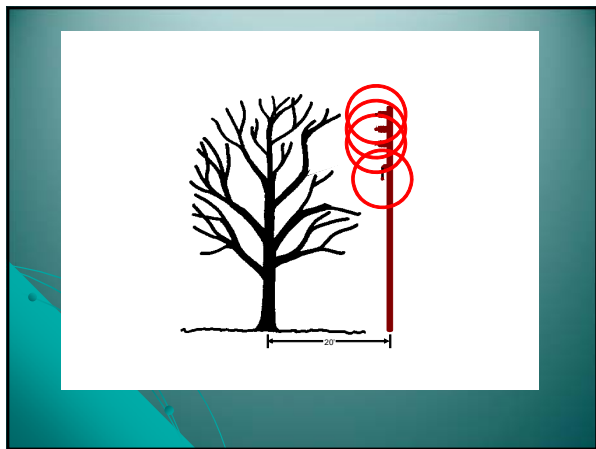
10 feet
Safety zone required
by ANSI standard

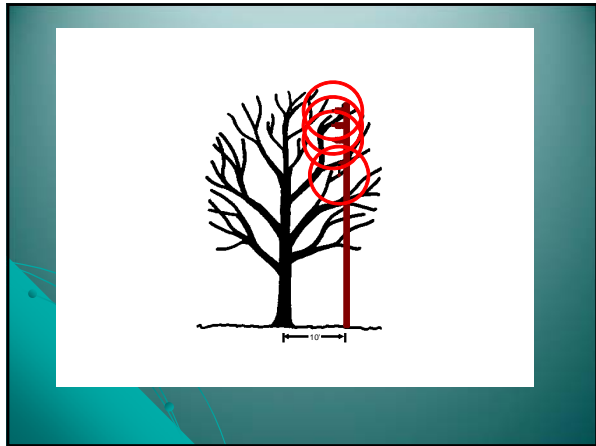


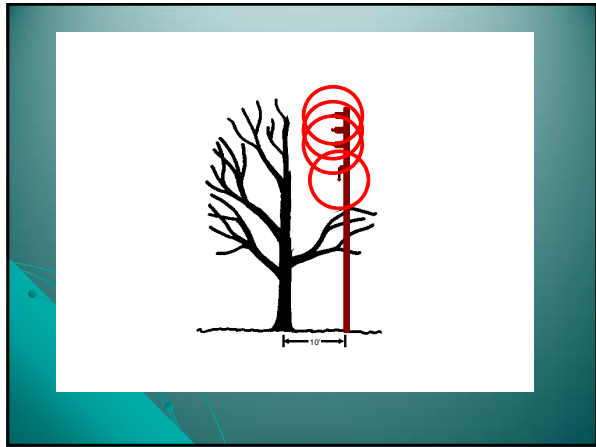


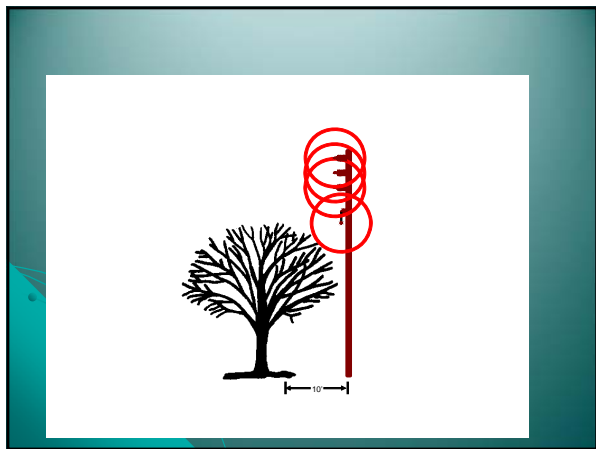












Summary

- All utilities must do vegetation management
- Clearances are determined by voltage involved
- Mandated by local, state, and federal regulations
- Right Tree, Right Place provides for safe reliable services for all in a state subject to weather extremes.

Any Questions???

For more information

<http://hort.ifas.ufl.edu/treesandpowerlines/>

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