THE UNITED ILLUMINATING COMPANY

Docket No. 13-12-25

Maintenance Plan for Transmission and Distribution Overhead and Underground Lines

Revised: December 17, 2013
July 11, 2014
Definitions:

**Tree Wire:**
All primary wire used in open wire construction that is covered with a 10/64 polyethylene coating.

**Non-Tree Wire:**
All primary wire used in open wire construction that either has no insulation (bare) or is covered with a material having little or no insulation value.

**Aerial Cable:**
Shielded primary cable suspended from a messenger attached to poles.

**Self-Supporting Cable:**
Unshielded insulated primary wire triplexed around a messenger attached to poles.

*Underground Cable*
Distribution: Includes both shielded primary cable in a splicing chamber and duct system, and direct buried cable.
Transmission: Includes pipe type, gas insulated, fluid filled and solid dielectric in a splicing chamber and duct system.
*Secondaries and services excluded

4. **Vegetation Management**

The United Illuminating Company remains committed to providing high levels of reliability, while simultaneously ensuring customer safety and satisfaction, and controlling cost. In 2013, the Company completed the sixteenth year of the Performance-Based tree trimming program. All customer requests and concerns about tree conditions are investigated and trimming is performed as required to eliminate those concerns whether from an electric safety or reliability point of view.

**Current Maintenance Specification (in affect 2011-2013)**

The overhead distribution line clearance program consists of a split four-year and eight-year cycle for planned tree trimming. The three-phase portion of the system is trimmed on a four-year cycle, while the single-phase portion of the system is trimmed on an eight-year cycle or where performance triggers more frequent trimming. Any single-phase portion of the system that experiences two or more tree related outages in a 36-month period is, at a minimum, trimmed to minimize the potential for future outages. Other system modifications, such as reconductoring bare wire with tree wire, may also be performed to help minimize the potential for future tree related outages. In addition, trimming is completed at new construction sites as needed.

Beyond the Line Clearance planned circuit miles program, the Company implements the following vegetation management programs to maintain or enhance the reliability of the electric distribution system:
• RCM Single Phase Line Clearance: RCM Single Phase Line Clearance is not part of the program work but rather performance based trimming initiated following occurrences of two tree related outages on a circuit during the prior 36 months. Trimming is performed based on the trim specifications on the entire side tap back to the first interrupting device. This is intended to minimize any tree related outages from occurring perpetually.

• Hazardous Trees: The Hazardous Tree program requires the complete removal to ground of all identified trees. Hazard trees are identified in several ways including; UI vegetation management resources, contractor permissions personnel, tree trim crews, town tree wardens and customers. The hazard tree removal program is designed to remove trees identified as dead, dying, diseased or structurally defective and located outside of the normal trim area, but pose a potential hazard to UI facilities. The process involves identification of hazardous trees through the circuit trimming program, reliability engineer, and Line Clearance Arborist and Technicians then communication with customers, CDOT and/or municipalities to inform them of the hazard and obtain permission to remove.

• Vine Management: Vine Management is the removal of various vines from poles and guy wires including the ground cut, removal, chip and disposal of debris.

• Distribution Rights-Of Way Line Clearance: Rights-of-Way Line Clearance is the removal of overgrowth on the distribution right-of-ways. Typically, such work is identified and generated through ROW inspections and maintenance trim cycles.

**Distribution Line Clearance Specification – UPZ**

UI is replacing its current vegetation management specification with an Enhanced Tree Trimming based specification, which will be the only UI vegetation management specification from January 1, 2014 forward.

The Distribution Line Clearance Specification (DLCS) proposes vegetation management within the UPZ resulting in a rectangular area extending horizontally for a distance of eight feet from any outermost electrical conductor or wire installed from pole to pole and vertically from the ground to the sky. Desirable low height or ornamental trees that are already in the zone or those that are planted under the Right Tree – Right Place program will remain. Compatible trees and shrubs listed in the State Vegetation Management Task Force Report or added by the DEEP in the future may remain in or be planted in the future in the UPZ.

The DLCS creates greater distance between the vegetation and conductor in order to reduce the likelihood that vegetation would impact the electric system during extreme weather events. This new specification would reduce vegetation that may come in contact with the electric infrastructure and should also improve the overall performance of the electric system.

On November 1, 2013 the Company submitted to the PURA for review, a more carefully considered, optimized plan for ETT before the Company is allowed to begin the program that
### Table 10: Maintenance Practices, Substations (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub Category</th>
<th>Frequency</th>
<th>Task Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings and Structures</td>
<td>Security and Safety</td>
<td>Monthly and whenever a station is visited</td>
<td>Includes testing of security systems, security inspections of interior and exterior facilities, fire-extinguisher inspections, first-aid kit inspections and similar tasks</td>
<td>NERC standard CIP-006 requires periodic testing of the system. Performing this testing with our existing perimeter alarm testing utilizes the same resources to perform both tests.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Annually</td>
<td>Maintenance and testing of security components and communications</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>Monthly</td>
<td></td>
<td>Facilities are cleaned, operation counts are taken and minor maintenance activities are performed</td>
<td></td>
</tr>
<tr>
<td>Roof Systems</td>
<td>Annually</td>
<td></td>
<td>Gutters and downspouts are inspected and cleaned</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 years</td>
<td></td>
<td>Substation roofs are inspected</td>
<td></td>
</tr>
</tbody>
</table>

### 5.2.6. Vegetation Management

The Vegetation Management Plan is described in Section 4. For the years prior to 2014, the “Line Clearance & Vegetation Management Specification” is included as Attachment 2, and the proposed-current “Vegetation Management Specification” for 2014 through 2021 is included as are in-Attachments 2 & 3.

### 5.2.7. General

Employee awareness of system conditions constitutes a vital source of information for UI to address maintenance requirements. Employees, as they travel to their work locations throughout UI’s territory, are encouraged to be observant and report any abnormal conditions to Electric System Operations & Maintenance so that appropriate action can be taken. This information, along with reports via telephone or written communication from our customers or others regarding abnormal system conditions, is captured in the computer-based Customer Request System. It is then forwarded to Electric System Operations & Maintenance for investigation and resolution, as required. The trouble conditions and subsequent resolution is captured in the customer call system, SAP.

Evaluation

Each tree must be evaluated individually at least 10 days prior to any non-emergent tree work being performed by contractor work planners and/or crew personnel. At the time of the evaluation consent will be obtained from the property owner. Each tree must be evaluated individually at the time it is trimmed least 10 days prior to sending a notice and at the time of any non-emergent tree work being performed by contractor work planners and/or crew personnel. Consideration must be given to the tree species, condition, growth rate and failure characteristics, PROW limitations, tree location, the potential combined movement of vegetation and conductors during routine winds, and sagging of conductors due to elevated temperatures or icing when performing line clearance, movement of branches and wires resulting in a change of clearance, due to storm and wind conditions, as well as circumferential branch and stem growth. This evaluation should include growth rate, species, shape, condition and location of the tree and the likelihood of encroachment to the UPZ. When requesting written consent for tree pruning or removal from municipal tree wardens, the State Department of Transportation, abutting property owners and private property owners. UI’s tree contractor Work Planners will use the 8 foot line clearance dimension as the starting point for evaluation of the UPZ and will normally request the removal of all encroaching trees and limbs. The actual distance will result from the required cut of the tree so that a healthy tree remains.

Pole mounted electrical equipment such as transformers, capacitors, switches, etc. should be provided at least ten (10) feet of clearance and in accordance with the DLCS – UPZ.

Secondary and service conductors should be cleared such that tree limbs do not rub conductors or entangle the wire.

A. Distribution Line Clearance Specification– Utility Protection Zone (DLCS)

DLCS establishes the “utility protection zone” which is the rectangular area extending horizontally for a distance of eight feet from any outermost electrical conductor or wire installed from pole to pole and vertically from the ground to the sky thru a four year cycle.

DLCS includes cutting, trimming and removal of tree limbs or trees within the utility protection zone and retaining desirable low height or ornamental trees that are already within the zone or those that are planted under a Right tree – Right Place program. Additionally, the Company would identify and remove in whole or in part hazardous trees that could fall from outside of the zone causing damage to utility infrastructure, facilities or equipment.

The following drawings illustrate the Utility Protection Zone:
B. Other Clearance and Operational Requirements

Trees or limbs imminently hazardous to any part of the Distribution System shall be patrolled and mitigated with notification to and approval from qualified UI personnel. Photographic evidence of the imminent threat is secured prior to threat mitigation, where possible or practical.

Pole mounted electrical equipment such as transformers, capacitors, switches, etc. should be provided at least ten (10) feet of clearance in accordance with the DLCS.

Secondary and service conductors should be cleared such that tree limbs do not rub conductors or entangle the wire.

Remove hazard trees within the UPZ and on private property after obtaining written consent from the abutting private property owner.

Pruning cuts shall be performed in a manner that retains the structural integrity and health of the vegetation.

Consideration shall be given to critical loads and the number of customers served by the circuit segment where tree work is performed.

No tree work shall be performed (pruning or removal) within the public right-of-way without a permit from the municipal tree warden or the State Commissioner of Transportation.

Any non-hazardous tree located in whole or in part within the UPZ may be retained, provided that its species, condition and growth rate indicate that pruning without removal will reduce the risk of harm to the utility infrastructure.

Written consent shall be obtained from the tree owner to prune or remove a tree on private property.

"Brush" is defined as an undesirable woody plant normally maturing at 20 feet or more in height, with single or multiple stems, and with a small, minimal, or no crown. It shall have a diameter at breast height (DBH, 4.5 feet above ground) of 6 inches or less. Brush shall be cut to the ground line where topography and obstructions will permit.

Vines shall be removed from down guys and poles. If vines are in contact with energized wires, the worker while in an aerial lift shall cut out a section of the vine stem measuring approximately one (1) foot in length starting at a point approximately 30 inches below the lowest electric wire. Then, the worker shall ground cut the vine(s) a minimum 5 feet from pole or down guy.

Street Lights – The local municipality is responsible to perform routine maintenance trimming to maintain street light patterns on sidewalks and roadways. Conflicts with energized lines shall be referred to UI by the municipality. Limbs in direct contact with street light mast or head shall be pruned clear to reduce possibility of equipment damage.

Private Area Lights – During routine maintenance, pruning should clear any vegetation on the pole which is obstructing the pole-mounted fixture.
This section of the plan is being amended to comply with the many changes to the notification and consent process required by Public Act 14-151 and will be filed no later than July 30, 2014.

Preface

UI overhead Transmission and Distribution infrastructure requires sufficient clearance from all vegetation to ensure safe, reliable electric service to our customers. Successful Vegetation Management performed on State, municipal, or a customer's property, secured through Notification, Permit, and/or Appeals processes, is paramount and achieved through good communications and public education.

Purpose

To provide the Company and its Contractor(s) a formal process for obtaining consent from the property owner to perform enhanced UPZ line clearance work and report cases where the property owner objects to the proposed Vegetation Management (VM).

Scope

The scope of the Customer Notification Process applies to vegetation management work performed on UI's overhead Transmission and Distribution System. Connecticut law requires UI to notify the abutting property owner of vegetation maintenance that is planned within the Utility Protection Zone (UPZ). Notification is for maintenance pruning and/or requested tree removals. UI asks for the property owners consent so that we may maintain safe and reliable electric service to customers. Property Owners have the right to object to the proposed tree work. If they do not consent, the law gives UI the right to appeal their decision to the tree warden or the Public Utilities Regulatory Agency.

Responsibilities

Contractor:

1. Obtain consent from abutting property owner within planned work area before starting any VM. If the property owner is not home, a “door knob hanger”, notification information, or other literature shall be delivered to the abutting property owner. Two additional attempts shall be made to obtain consent of VM using the best means available and practical (door-hanger, direct phone calls, etc.). All attempts to make contact for the VM shall be logged noting the dates and times that the attempts were made.

2. Where consent has not been obtained after three attempts, the contractor crew foreman, or contractor supervision, is to complete the “Contractor Consent/Clearance” form (Exhibit A). For the DLCS, the Contractor must include notes on this form to identify: “Serious” Conditions (e.g. burn marks, limb heavy on wire, etc.) OR "Non-Serious" Conditions, or other required information.

3. For the Transmission Vegetation Management Program the Contractor will use the "NERC Clearance Issues" forms Clearance 1 and 2 (Exhibit B & C), or other applicable provided forms,