



## Operations Bulletin

#OP5.00

### Subject: Vegetation Management

Effective: January 1, 2001

Revised: February 1, 2007

*Issued by: R. Letourneau*

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#### 1.0 Purpose

To establish a standardized vegetation management program for the Unitil system companies in order to insure consistency and the best practices approach in achieving reliable operation of the overhead T&D systems in accordance with Unitil's Strategic Plan.

#### 2.0 Scope

This bulletin applies to the vegetation management program for all Unitil electric distribution systems and provides the required guidelines, necessary standards, and performance measures necessary for a continuing assessment of the effectiveness of the program.

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## 4.0 Methods

Vegetation management methods apply to both Unitil's Transmission system and Distribution system. Transmission methods and frequency differ from distribution methods due to the fact our transmission system is, for the most part, off-road and located within rights-of-way. The topography, land-use, the company's rights, and the fact our transmission system is the backbone of a reliable energy delivery system dictate more aggressive trimming methods and also various types of vegetation control. The Distribution methods, although not as aggressive as Transmission, still require minimum line clearance specification, however with less variation in trimming methods. The following sections describe approved methods of vegetation control.

### 4.1 Transmission Vegetation Control

Transmission vegetation control is defined as the process and methods utilized to maintain the company's rights-of-way. Because the transmission system is an integral component of a reliable energy delivery system, and because of the higher voltages of

our transmission lines, tree and limb contact must be completely eliminated through inspection and trimming programs. The higher voltages are less tolerant to tree and/or limb contact and added clearance is preferred. Added clearance is also preferred to speed transmission foot patrols during routine maintenance inspections or during outage situations where a fault has occurred and the ability to quickly isolate the fault is necessary to sectionalize the line or begin immediate repair work in order to minimize outage time to our customers.

Several methods will be described in this bulletin. Although not any one single method is the most effective, the distribution company shall endeavor to deploy the most efficient and effective method of vegetation control based upon the topography of the land, types of vegetation in terms of growth rates, the company's rights, state and federal law, and any other regulations which may apply.

#### **4.1.1 Transmission Cycle**

Transmission vegetation control shall be completed on a 5-year cycle. This results in the maintenance of one-fifth of the transmission system on an annual basis. The determination of the amount of trimming may be calculated based upon the pole miles of transmission line or acreage. Since many of our rights-of-way have more than one line, and because many rights-of-way can accommodate more than the existing facilities, the preferred unit of measure shall be acres. The acres unit of measure accommodates varying line configurations as well as varying widths of right-of-way. Therefore all planning and reporting of transmission vegetation control shall utilize acres as the standard unit of measure.

#### **4.1.2 Selective Trimming**

Selective trimming is defined as tree removal in the transmission right-of way employing conventional methods. Conventional methods include the identification of the tallest vegetation within the right-of-way and removal of such vegetation utilizing various saws and chippers/shredders. This method has several benefits including no restrictions on topography since personnel often walk the right-of-way, transporting all the required equipment by hand.

#### **4.1.3 Herbicide Applications**

The spraying of herbicides by certified contractors has shown to be a cost effective vegetation management tool. Increased regulation in this area has resulted in an increased administrative burden. However at this time the additional responsibilities have not outweighed the resulting benefits. Therefore this method continues to be a preferred method of transmission vegetation control for Unitil Companies.

Careful planning and accurate records are required in order to properly execute a successful herbicide program. Knowledge of federal and state laws as well as local ordinances need to be researched to determine proper application. Because laws between Massachusetts and New Hampshire could vary, this Operations Bulletin will not address one specific method. Instead the bulletin will outline the steps currently utilized by one New Hampshire DOC. These steps are as follows:

1. Obtain herbicide permit from the NH Department of Environmental Services. This is the responsibility of the certified contractor performing the spraying.
2. By means of certified mail, notify the selectmen, mayor, or town manager in the city or town where the rights-of-way are located (refer to Appendix A for copy of sample letter).
3. Notification to the public through the use of notices in one newspaper of statewide circulation and in all newspapers of local circulation (refer to Appendix B for copy of sample notice).
4. Notification through billing stuffers, by telephone, or in person each abutter along the right-of-way where herbicides are to be applied. Abutters shall be offered alternative vegetation management, i.e. mechanical clearing. This is New Hampshire state law (RSA 374:2-a) and the wishes of the landowner shall take precedence.
5. Posting signs every 200 feet along the perimeter of the right-of-way where herbicides are to be applied.

New Hampshire State law further stipulates the format of the newspaper advertisements, including specific information required for publication as well as a requirement that the advertisement be a "coupon" that may be clipped and mailed back to the utility.

The information provided in this Operations Bulletin shall be used as a guideline and is **not intended to be all-inclusive**.

Herbicide applications are not practical for all applications. For example, rights-of-way that include a large percentage of farmlands, or rivers/streams would not be conducive to herbicide use. However for many applications, herbicide use continues to be an efficient, cost-effective method of controlling growth along Unital's rights-of-way.

#### **4.1.4 Mowing**

The mowing of transmission rights-of-way is defined as the mechanical removal of vegetation using various motorized apparatus that may be attached to off-road equipment. The topography must be free of rivers and large streams since the equipment is unable to cross such obstacles. Several vendors have become proficient in this method and Unital has contracted with them with favorable results.

#### 4.1.5 Side-Cutting

Side cutting is defined as vegetation control at the edge of the right-of-way. Side cutting shall be utilized in conjunction with other forms of vegetation control and is therefore not a practical transmission vegetation control method on a stand-alone basis. In other words, side-cutting supplements transmission vegetation control methods utilized to control vegetation within the right-of-way.

Tree limbs that grow from outside the actual right-of-way can jeopardize the integrity of the transmission system and therefore must be removed. Furthermore, dead and danger trees also pose risks. Dead trees may fall into adjacent trees at the edge of the right-of-way, leaning towards the transmission line posing a threat to the transmission line itself. Danger trees, defined as dying trees that have weak limbs or trunks, may also pose similar risks. Side cutting is designed to eliminate these threats.

#### 4.2 Distribution Vegetation Control

Distribution vegetation control is defined as the systematic removal of vegetation growth along Unifil's distribution circuits. The majority of distribution circuits are along the roadway and unlike transmission methods, distribution methods are not as varied and are usually performed from a bucket truck using various sawing techniques. In addition to trimming trees, the identification and removal of danger trees is also a significant part of vegetation control.

Distribution vegetation control shall be scheduled through a combination of circuit SAIDI, circuit SAIFI and a predetermined cycle by circuit and voltage class.

##### 4.2.1 Conductor clearances

The goal of distribution vegetation control is to limit the opportunity for tree contact while trimming a reasonable volume of vegetation. The following clearance guideline should be followed to whenever possible.

	Multi-Phase	Single Phase
Clearance above primary conductors	15 foot minimum plus danger trees and dead wood	6 foot minimum above plus danger trees and deadwood
Clearance adjacent to primary conductors	8 foot minimum plus 20 foot minimum clearance for danger trees and deadwood	6 foot minimum plus 20 feet minimum clearance for danger trees and deadwood
Clearance below lowest attachment point on pole	Ground cut or four (4) feet below lowest telephone cable.	Ground cut or four (4) feet below lowest telephone cable.

The specifications listed above and further detailed in Appendix C shall be strictly followed. However, it is recognized that, from time to time, proper permissions may not

be granted from property owners. In addition, scenic road designations may preclude the achievement of specified clearances. Permission problems and/or scenic road designations shall be well documented on daily timesheets (See Section 6.3, Performance Metrics) for auditing purposes.

#### 4.2.2 Distribution Cycle

Distribution vegetation control shall be completed on a cycle according to the following table:

Voltage Class	Cycle	
	Three Phase	Single Phase
4 kV	8 years	10 years
13.8 kV	5 years	7 years
34.5 kV	4 years	5 years

The determination of the amount of trimming shall be calculated based upon the pole miles of distribution circuits, by voltage class, excluding secondaries and services. These figures shall be determined based upon the annual statistical report compiled by individual distribution operation centers (DOCs).

#### 4.2.3 Danger Trees and Deadwood

Danger trees and deadwood are defined as dead or dying trees or limbs that pose a threat to distribution circuits upon their failure. These dead trees or limbs may break away at any time, fall into the circuit and result in damage to our facilities. Managing dead trees and limbs requires identification and removal at the earliest possible stage. Methods for removal include flat cutting the entire tree or removal of the problem branches. The objective is to ensure that if the tree failed, the integrity of the distribution circuit will be maintained.

Third party participation shall be pursued in all danger tree removals prior to commencement of the program. Participation is based upon the current Intercompany Operating Procedure as detailed in Section 4.2.5 of this Operating Bulletin. Reimbursement provides significant payment to Utilil allowing for further funding of the Vegetation Management Program. Refusal of participation shall be properly documented.

#### 4.2.4 Maintaining Services

Services shall be reviewed for trimming on the same cycle and concurrently to the distribution primary circuit. Services and secondary pole lines shall not be trimmed unless a tree/branch is directly in contact with the conductor. For the purpose of record

keeping and metric evaluation, services and secondary pole lines trimmed shall be categorized as unscheduled work.

#### **4.2.5 Customer Trimming Requests**

Customer requested service trimming requires careful assessment and management. These requests, if not handled properly, may result in a significant resource commitment both in terms of dollars and administrative labor without a proportional benefit to outage and/or damage prevention. In addition, improperly managed requests may result in negative customer sentiment.

Each request shall be individually reviewed in the field after a discussion with the customer reveals that a potential problem exists. Only those services that have significant contact with vegetation and/or are in harms way due to danger trees shall be trimmed. All other service shall not be trimmed. The customer shall receive notification as to the position of the company and shall also receive a complete explanation as to the decision.

#### **4.2.6 Intercompany Operating Procedures**

The purpose of the Intercompany Operating Procedure (IOP) is to establish a definite method of allocating costs of trimming associated with both construction and maintenance of joint pole lines.

Maintenance trimming shall be done on a joint basis. This joint participation is dependent upon the individual IOP's established with each telephone company however the division of costs are typically either 75% Unitil and 25% telephone or 80% Unitil and 20% telephone.

Heavy storm work shall be handled immediately without prior review. The parties agree to a reciprocal acceptance of each other's tree contractors for heavy storms on a 50%/50% basis, provided field representatives, as soon as practicable after a major storm, meet to communicate cities/towns, streets, and lines trimmed as a result of said storm. Subsequent bills to include the same information.

Lastly, removal of danger trees including large limbs that threaten both parties' facilities shall be removed on a 50%/50% basis, subject to prior field review wherever possible (see Section 4.2.2 of this Operating Bulletin).

### **5.0 Standards**

Standards refer to required conductor clearances relative to vegetation growth. In all cases these standards shall be realized unless designated scenic roads and /or appropriate permissions from landowners can not be obtained.

Please refer to Appendix C for a pictorial view of standards.

## 6.0 Performance Metrics

In order to measure the effectiveness of the trimming program, data shall be collected on a continuous basis and performance metrics shall be calculated and published, by DOC, on the Operations Systems web page. Comparative analysis shall allow for continued improvement in vegetation control methods and techniques. Responsibility for the collection of data, accurate and timely reporting, and comparative analysis shall rest with the DOC's respective Manager of Electric Systems or their designee. Performance metrics shall be updated no less than once per month.

### 6.1 Effectiveness Measures

In order to monitor the effectiveness of the transmission trimming program, each DOC shall record the **total number of momentary or permanent outages** experienced on our transmission system on a monthly basis. Only those momentary and permanent outages related to tree or limb contact are utilized for this metric. Additionally, only those trees and limbs that are within the trim zone shall be included. The metric is expressed as follows:

**Transmission Effectiveness = Total number of momentary or permanent outages**

The logic behind the measure is that an effective transmission trimming program shall have the objective of minimizing these types of interruptions.

In order to monitor the effectiveness of the distribution trimming program, each DOC shall record the **number of tree-related outages, by voltage class**, on a monthly basis. This number shall be divided by the **total number of pole miles per respective voltage class** in the DOC as described in Section 4.2.1. The quotient, expressed as follows, shall comprise the effectiveness measurement for distribution vegetation control:

**Distribution Effectiveness =  $\frac{\text{Number of tree-related outages (by voltage class)}}{\text{Total number of pole miles (by voltage class)}}$**

The logic behind the measure is that an effective trimming program shall have the objective of minimizing tree-related outages.

## 6.2 Efficiency Metrics

Efficiency metrics are designed to compare costs and ensure that resources are deployed in a manner that achieves the greatest amount of trimming for the dollars expended.

For Transmission efficiency, each DOC shall record **dollars expended** and **acres maintained**. The quotient, expressed as follows, shall comprise the effectiveness measurement for transmission vegetation control:

$$\text{Transmission Efficiency} = \frac{\text{Total dollars expended}}{\text{Total acres maintained}}$$

For Distribution, each DOC shall record **dollars expended** and **sections of primary conductor trimmed**. The quotient, expressed as follows, shall comprise the effectiveness measurement for distribution vegetation control:

$$\text{Distribution Efficiency} = \frac{\text{Total dollars expended}}{\text{Number of sections trimmed}}$$

The **number of sections trimmed** shall also include services. In other words, one service is equal to one section.

The logic behind this measurement is that the most efficient crews shall be more productive and able to achieve the lowest cost per section of circuit trimmed.

## 6.3 Daily Timesheet Information

All vendors performing maintenance or construction trimming shall complete daily timesheets. See Appendix D for a copy of the timesheet.

This timesheet is designed to collect the necessary data that will be utilized to process vendor invoices and to calculate performance metrics. It shall be the responsibility of the Manager, Electric Systems or their designee to ensure the timesheets are completed daily, and that all required information is included.

Information on the daily timesheet includes:

General Information:

- Date
- Street
- Town

- Circuit
- Voltage

Pole Numbers

- Company pole number
- Telephone pole number

Quantity of work:

- Number of sections trimmed
- Number of services trimmed

Type of work:

- Scheduled work
- Unscheduled work
- Construction related
- CWO number
- Storm work
- Other trouble
- Customer Trim Request

Type of Clearing:

- Trees trimmed – L (light), M (medium), H (heavy)
- Ground Cut
- Dead/Hazardous trees or limbs removed

Type of Construction:

- 1 – Single Phase, 2 – Two Phase, 3 – Three Phase
- Secondary Only
- Service Only

Time:

- Labor
- Equipment/Vehicle

Telephone Participation

- Trimmed for Telephone Y/N
  - See individual IOP's for division of participation.

## **6.4 Monthly Reports & Map Updating**

Monthly progress reports shall be available. These reports shall provide specific information regarding the status of individual DOC vegetation management programs. Information shall include annual schedules for transmission and distribution programs, scheduling status, and performance metrics. The report will be completed by individual DOC and then rolled into one single, Unitil system report. Please see Appendix E for format of report.

It shall be the responsibility of the Manager, Electric Systems or their designee to update the Operations System web site no less than once per quarter. In addition, each DOC shall utilize circuit maps as a means to track circuit trimming. These maps shall detail the specific locations that our facilities were trimmed along with appropriate dates. These maps shall remain on file for at least one complete cycle.

## **6.5 Supervision**

The Manager, Electric Systems or their designee shall be responsible for developing schedules and monitoring the progress of said schedules. The Manager, Electric Systems, shall be responsible for monitoring the efficiency and effectiveness of the contract crews, ensuring that their productivity and quality are as expected.

Any knowledgeable DOC employee may perform monitoring of the contract crews. Monitoring includes live field visits and post-audit inspections. The results of these field visits and audits shall be reported to the Manager, Electric Systems.

## **7.0 Budgeting Criteria**

Transmission and Distribution Trimming budgets shall be completed annually based upon the scheduled cycle, volume of trimming, as well as an estimate of unscheduled work. On an annual basis, Unitil engineering shall review reliability performance on a circuit by circuit basis (SAIDI and SAIFI). Operations shall use this information to develop the trimming schedule for the year. In addition, Engineering will make recommendations on problem areas with the ultimate objective of improving the System Average Interruption Duration Index, or SAIDI. This analysis shall be completed during the annual capital budgeting process. Operations shall endeavor to complete the identified trimming projects as early as possible in the fiscal year so that the SAIDI benefit may be realized as soon as possible.

## **7.1 Annual Costs**

Annual costs shall be based upon the volume of work required for that cycle year and the amount of expected trimming, including both scheduled and unscheduled work. Either acres (for Transmission) or pole miles (for Distribution) shall be utilized in conjunction with the costs recorded for the performance metrics detailed in Section 6.0. It is also necessary to pre-select trimming methods, i.e. side-cutting, herbicide application, mowing, etc., before commencement of a budget.

## **7.2 Determining Volume of Work**

In order to determine the volume of work, the amount of vegetation growth needs to be established. The type of clearing (Light, Medium, and Heavy) can only be determined by field inspection. Prior to budgeting, the areas to be trimmed shall be inspected to determine vegetation growth. The information from this inspection shall then be utilized to calculate required resources for the cycle year.

In an area where it is anticipated that work shall be placed out to bid, Unitil shall endeavor to perform such bidding in advance of the actual budgeting process. This will allow for more accurate budgeting.

## **7.3 Vendor Selection**

Criteria for vendor selection shall be based upon cost and performance. It is also strongly recommended to select a vendor that is able to provide additional resources during storm events.

On a routine basis, Unitil shall solicit request for proposals from local tree contractors. These proposals shall include a listing of personnel and equipment, along with any ancillary services the vendor may provide. Other selection criteria include the safety record of the vendor and minimum insurance requirements as set fourth in Unitil Policies. The DOC management will then evaluate the proposal and select an appropriate vendor.

## **7.4 Competitive Bidding**

Competitive bidding is an effective method for performing either maintenance trimming or construction trimming. Not all work is conducive to bidding. In most cases, the best utilization of competitive bidding is for work that is confined to a definitive scope. Work included is this is as follows:

- Complete circuit trimming
- Off-road trimming
- Long line extensions along public way
- Major system improvements such as voltage conversions
- Specialty trimming (mowing, herbicide application)

Competitive bid documents shall be developed to request various different staffing alternatives. Three different approaches to bidding shall be used:

1. Per circuit – Not to exceed cost
2. Per hour cost based upon known schedule
3. Alternative approach
  - a. Minimum of 1 crews on site bid on a per hour cost
  - b. 1 crew on site as required bid on a per mile basis

Considerations should be given to limit the age of equipment used by the contract tree crews. Alternatively, maintenance time for contract tree equipment should not be included in the bid.

### **7.5 Hot Spot Trimming**

From time to time “hot spot” trimming (unscheduled work sections) is required due to tree contact and or multiple outages as a result of tree contact. This usually happens off cycle as a result of increased vegetation growth or non-compliance with standards during normal cycle maintenance.

It is important that hot spot trimming is carefully managed as this practice is inefficient and results in increased costs. It is recognized that hot spot trimming is a necessary part of vegetation control, but its use shall be minimized to the extent possible.

### **7.6 Emergency Trimming**

It is reasonable to assume that contract tree crews will be required to assist with outage restoration throughout the year. Tree trimming during outage restoration conditions should follow the same standards as described in this document.

# Appendix A



Exeter & Hampton  
Electric Company

Current Date

Town of Plaistow  
Board of Selectman  
145 Main Street  
Plaistow, NH 03865

RE: Vegetation Control Program on Transmission Lines

Dear Selectman:

I am writing to inform you that Exeter & Hampton Electric Company will be conducting our vegetation control program on our transmission lines in parts of your town, scheduled to begin \_\_\_\_\_ . Please refer to the enclosed map of the area in which we will be working.

The general treatment method will be selective foliage treatment using Monsanto's Herbicide "Accord", and Dupont's "Krenite". The Accord and Krenite will be used for the full width of the right-of-way to control vegetation and if trees are too tall to be sprayed, they will be cut down and the stumps treated to prevent sucker growth.

All work will be done in compliance with applicable Federal and State of New Hampshire rules and regulations.

A Notification Request Coupon is enclosed for individuals who own property over which the right-of-way passes, or whose property abuts the right-of-way and who wish to be notified in writing thirty (30) days prior to any treatment. Coupons must be received no later than \_\_\_\_\_. Requests after this date will not be granted until the next treatment cycle. As we have done in the past, we will also notify all abutters along our transmission line by telephone.

Exeter & Hampton Electric Company will be working very closely with all parties involved and any questions or concerns you may have may be directed to me at the number below between 7:00 AM and 3:30 PM, Monday through Friday.

Very Truly Yours,

Business Office

114 Drinkwater Road  
Kensington, NH 03833

Phone: 603-777-5500  
Fax: 603-777-5600

Email: ehec@unitil.com

Safety & Facilities Coordinator

FG&E190

# Appendix B

**Public Notice - Right-Of-Way Maintenance Schedule**

To ensure safety and service reliability to its customers, Exeter & Hampton Electric Company will be conducting maintenance on a portion of its transmission rights-of-way from mid-August into September. Herbicides will be used to treat certain species of fast-growing trees while leaving undisturbed low-growing grasses and other vegetation. Accord and Krenite are approved by the U.S. Environmental Protection Agency and the N.H. Division of Pesticide Control, and will be applied by licensed professionals with hand-held application tools.

Right-of-Way Number	Approx. Treatment Commencement Date	Location
3358	August 18 - 22	Plaistow
3345, 3356	August 25 - 29	Plaistow, Kingston
3343, 3354	September 2 - 6	E. Kingston, Kingston, Kensington, Hampton Falls

Further information can be obtained Monday - Friday 8:00 a.m. - 3:30 p.m. by contacting: David R. O'Brien, Supervisor  
 Unitil/Exeter & Hampton Electric  
 114 Drinkwater Road, Kensington NH 03833  
 803/772-5916 or 1-800-582-7276

A Notification Request Coupon is provided below for individuals who own property over which the right-of-way passes, or whose property abuts the right-of-way and who wish to be notified thirty days prior to any treatment. Coupons must be received no later than July 18, 1997. Requests received after this date will not be granted until the next treatment cycle.

Rights-of-way are generally located away from streets and may be identified by the metal tag on a pole or structure with a number on it. The Division of Pesticide Control has marked all known public water supplies along that rights-of-way and these areas will be avoided. It is the responsibility of each landowner or resident to make Exeter & Hampton Electric Company aware of the location of a potential water supply and any environmentally sensitive areas where herbicide application ought to be avoided.

**NOTIFICATION REQUEST COUPON**

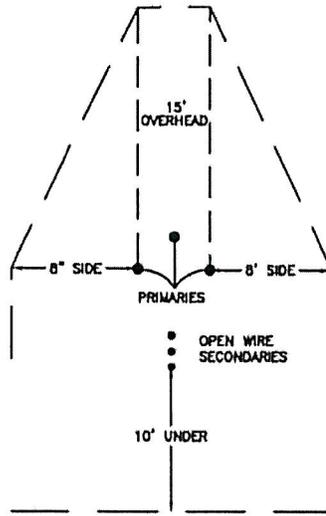
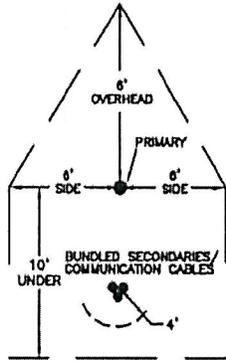
Name: \_\_\_\_\_ Town/City of Involved Property: \_\_\_\_\_  
 Street Address: \_\_\_\_\_ Ph (Home) \_\_\_\_\_  
 Town: \_\_\_\_\_ Ph: (Work) \_\_\_\_\_  
 State: \_\_\_\_\_ Zip Code \_\_\_\_\_ Ok to use Work No:  Yes  No  
 Property of Concern: \_\_\_\_\_  
 Sensitive Areas: \_\_\_\_\_  
 Name of Utility Company: \_\_\_\_\_  
 Approximate Line and Pole Numbers: \_\_\_\_\_

For further information call (803) 772-5916 or (NH) 1-800-582-7276  
 Return by July 18, 1997



# Appendix C

MINIMUM CLEARANCE ZONE DIMENSIONS  
FOR ELECTRICAL CONDUCTORS  
AND COMMUNICATION CABLES



NOTES:

OVERHEAD CLEARANCE SHALL BE MEASURED VERTICALLY UPWARD FROM THE HIGHEST PRIMARY OR OPEN WIRE SECONDARY.

SIDE CLEARANCE SHALL BE MEASURED HORIZONTALLY OUTWARD FROM THE OUTERMOST PRIMARY OR OPEN WIRE SECONDARY.

UNDER CLEARANCE SHALL BE MEASURED VERTICALLY DOWNWARD FROM THE LOWEST PRIMARY OR OPEN WIRE SECONDARY.

NORMALLY REMOVE ALL BRANCHES WITH THE MINIMUM CLEARANCE ZONE BOUNDED BY THE DASHED LINE PERIMETER.

IF THE EXISTING CLEARANCE IS LESS THAN THE MINIMUM REQUIRED CLEARANCE BETWEEN THE TREE TRUNK OR LARGE HEALTHY LIMB (WITH STRONG CROTCH) AND WIRES, LEAVE THEM AND REMOVE ALL OTHER BRANCHES WITHIN THE MINIMUM CLEARANCE ZONE.

						DRAWN <i>M&amp;C</i>		 Unitil Service Corp.	TREE TRIMMING CLEARANCES FOR ELECTRICAL CONDUCTORS AND COMMUNICATION CABLES						
						CHECKED <i>SW</i>									
A UPDATED WITH BULLETIN REVISIONS						MP	02/05/06	NS	NS	APPROVED		SCALE	DATE	SHEET	DRAWING NO.
REV.	DESCRIPTION					BY	DATE	CHK	APR	<i>SW</i>		N/A	11/30/00	1 of 1	UAG0004
REVISIONS															



## SPECIFICATION FOR LOCAL DISTRIBUTION LINE CLEARANCE

### 1. SCOPE OF WORK

This specification covers the trimming and removal of trees and brush along the urban and rural overhead electrical lines owned by Unitil.

### 2. LINE CLEARANCE OBJECTIVES

- A) The tree position (relative to the wires), species and condition of the tree determine the type of trimming required. It is the contractor's responsibility to be knowledgeable about and to instruct his crews in various techniques necessary for trimming individual trees. Clearance shall be sufficient all around primary and open wire secondary conductors to keep them free of tree contacts for at least five (5) years. All dead, decayed or insect-damaged limbs are a hazard to the lines and shall be removed.
  
- B) In case of ornamental trees, care must be taken when trimming and done in such a manner that the final shape of the tree is evenly proportioned.

### 3. PRIMARIES AND OPEN WIRE SECONDARIES

- A) Minimum conductor clearances relative to various primary and open wire secondary positions are shown in the table below and in Figures 1 and 2.

	Multi-Phase	Single Phase
Clearance above primary conductors/ open wire secondaries	15 foot minimum plus danger trees and dead wood	6 foot minimum above plus danger trees and deadwood
Clearance adjacent to primary conductors/ open wire secondaries	8 foot minimum plus 20 foot minimum clearance for danger trees and deadwood	6 foot minimum plus 20 feet minimum clearance for danger trees and deadwood
Clearance below	Ground cut or the greater of four (4) feet below lowest telephone cable or 10 feet below primary conductors/open wire secondaries	Ground cut or the greater of four (4) feet below lowest telephone cable or 10 feet below primary conductors/open wire secondaries

- B) Figure 2 shows the minimum clearance zone around the conductors. It explains how to deal with situations in which tree trunks or large limbs are within the minimum clearance zone.

### 4. OPEN WIRE SERVICE DROPS

Minimum clearance normally shall be two (2) feet around. If the existing clearance is less than two (2) feet between a tree trunk, leader, or large limb and conductors, remove all other small branches within two (2) feet all around the conductors. If a tree trunk or large limb is rubbing against conductors,

report the condition to Unitil for a decision as to whether tree work or line work will be performed to correct the condition.

## 5. SECONDARY CABLE SERVICE DROPS

During scheduled maintenance, all services will be inspected along trim route and any service where there is hard rubbing should be trimmed to a minimum of two (2) feet all around to prevent chafing which could cause cable failure.

Service trims should be performed by one crew member while the other is performing other ground work such as position the bucket truck or paperwork. However, each crew member shall be within visual contact of the other at all times in order to maintain safe work practices.

## 6. LINE EXTENSION: PRIVATE PROPERTY

- A) Before the initial installation of wires, maximum efforts shall be made to remove all tree species in a trip centered on the new pole line as follows:

Single phase primaries and/or secondaries:  
10 feet each side of pole line center

Three phase primaries:  
14 feet each side of pole line center

- B) Outside of the defined trip, tree removal and tree trimming shall be performed as necessary in conformance with the major articles immediately following.
- C) NOTE: Line clearing for the initial installation of overhead conductors in a development or on private property shall be paid for or provided by the developer or customer and the tree contractor shall be advised accordingly.

## 7. LINE EXTENSIONS: PUBLIC WAY

- A) Follow IOP with applicable telephone company.

# Appendix D



# Appendix E

## Unitil System

### Plan and Progress Reporting

Transmission  
*Scheduled Work - Acres*  
*Scheduled Work Complete - Acres*  
*Cumulative Schedule Accuracy*

Distribution  
*4 kV Scheduled Work - Sections*  
*4 kV Scheduled Work Complete - Sections*  
*13.8 kV Scheduled Work - Sections*  
*13.8 kV Scheduled Work Complete - Sections*  
*34.5 kV Scheduled Work - Sections*  
*34.5 kV Scheduled Work Complete - Sections*  
*Unscheduled Work - Sections*  
*Total Work - Sections*  
*Cumulative Schedule Accuracy*

### Effectiveness Metrics

Transmission  
*Number of permanent outages*  
*Number of momentary outages*

Distribution  
*4 kV tree-related outages*  
*4 kV pole miles*  
*4 kV cumulative tree outages per mile*  
*13.8 kV tree-related outages*  
*13.8 kV pole miles*  
*13.8 kV cumulative tree outages per mile*  
*34.5 kV tree-related outages*  
*34.5 kV pole miles*  
*34.5 kV cumulative tree outages per mile*

### Efficiency Metrics

Transmission  
*Total Dollars Expended*  
*Actual Work - Acres*  
*Cumulative Expense Per Acre*

Distribution  
*Total Dollars Expended*  
*Total Work - Sections*  
*Cumulative Expense Per Section*