

**CENTRAL MAINE POWER COMPANY  
RESPONSE TO ORAL DATA REQUEST NO. 3  
DOCKET No. 2008-255**

December 4, 2008

**ODR-03-46**

**Q.** Please provide the most current vegetation management standards for PSNH or NU.

**A.** The current vegetation management standard for NU, M8-MT-3002, and the detailed specifications for the vegetation management are attached.

**Response Prepared and Submitted By:**

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Northeast Utilities Service Company

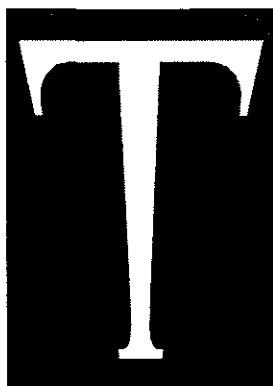
**Attachment(s):**

1. M8-MT-3002, Rev 5 Transmission Vegetation Management administrative procedure.
2. Specification for Rights of way Vegetation Management



**Northeast  
Utilities System**

***Transmission***



# **Administrative Procedure**

## **Transmission Vegetation Management**

M8-MT-3002, Rev. 5

Process Owner: Dwayne M. Basler  
Director-Transmission  
Maintenance & Work Mgmt

Effective Date: 09/18/2008



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## 1. Purpose

Effective scheduling, performance and documentation of vegetation clearing activities is essential for ensuring the continued operation of the transmission system as well as providing clear and open corridors for line inspection, maintenance and emergency restoration activities.

The performance of regularly scheduled patrols of all facilities to identify potential vegetation problems and perform corrective actions to prevent contact with the overhead facilities is also a major component of the Vegetation Management (VM) program.

Finally, the investigation and reporting of all vegetation-caused operations is a regulatory requirement performed by the VM organization.

## 2. Scope

This Administrative Guideline covers the programs administered by the Northeast Utilities Transmission Vegetation Management Section and includes the following activities:

- Rights-of-Way Brush Control
- Rights-of-Way Side Trimming and Clearing
- Vegetation Management Patrols and Inspections
- Hazard Tree Program
- Communicating Imminent Vegetation Problems
- Vegetation-caused Operations Investigations and Reporting

This document also describes the departments, people and processes affected by VM programs.

### 3. Roles and Responsibilities

#### **Director – Transmission Maintenance and Work Management**

The Director – Transmission Maintenance and Work Management (TMWM) is responsible for all maintenance activities on the NU transmission system. Vegetation Management is one of the major components of the transmission maintenance program.

#### **Manager - Transmission Line Construction and Maintenance**

The Manager – Transmission Lines and Contract Services is responsible for the performance of the Vegetation Management Section and all activities performed under the VM's authority.

#### **Supervisor – Transmission Vegetation Management**

First-line level owner of all Transmission Vegetation Management programs and activities, the Supervisor - TVM is responsible for the development of all cyclical programs as well as the development, administration and management of the annual budget, work schedules and reports on the VM programs.

The Supervisor – TVM reports directly to the Manager Transmission Lines and Contract Services

#### **Arborist – Transmission (by state)**

Transmission Arborists are assigned for each state to oversee the day to day performance of contractor work in the field. They manage the performance of right-of-way patrols and inspections required by the VM section and report to the Supervisor – TVM. The Arborists also assist in the development of the annual work plan for VM.

#### **Transmission Contract Administrator**

Transmission Contract Administration assists in the preparation of all contracts managed by the VM Section and serves as the liaison between the VM Section and NU's Purchasing Department for the procurement of goods and services used during the course of the VM activities.

#### **Purchasing Agent**

The Purchasing Section is responsible for the contracting of all VM projects and the development of purchase orders for all contracted Vegetation Management activities. The Transmission Contract Administration section interacts directly with the Purchasing Agent to distribute contracts, review bids and rates and to award contracts and projects.

**Transmission Line Clearance Contractors**

Transmission Line Clearance Contractors perform the actual line clearance activities for each of the programs listed and are under the direct management of the Transmission Arborists.

## 4. Program Administration

The management and oversight of the Vegetation Management activities for the NU Transmission Group fall under the direction of the Transmission Vegetation Management Section (TVM). The TVM Section employs personnel whose sole responsibilities are the administration of the VM program activities.

The TVM Section is managed by the Supervisor – TVM and the day to day activities performed by the contractors are managed by the Transmission Arborists.

The qualifications for the Supervisor include at a minimum a four-year degree in Forestry, Arboriculture, Natural Resources or other relevant biological science major. In addition, the Supervisor must have several years experience in utility line clearance vegetation management practices, methods, techniques and materials and be proficient in communication and administrative abilities.

Transmission Arborists must possess at a minimum a two-year degree in the areas of Forestry, Arboriculture, Natural Resources or other relevant biological science major. Experience in utility line clearance activities is also required as well as the ability to possess state issued certifications for Arborist and rights-of-way pesticide applicators.

TVM personnel receive periodic training in accordance with a company established training matrix on topics and skills suited to the TVM section.

## 5. Process Steps

### 5.1. Right-of-Way Brush Control

Right-of-Way Brush Control involves the cyclical management of vegetation within the maintained portion of the right-of-way. Required clearances conform to ISO-NE – OP3 standards and are listed under Attachment C. Each year approximately 25% of the system acreage under rights-of-way is managed to remove targeted tree and shrub species. All work is performed by contract vendors and all work is performed within one calendar year.

Vegetation control methods in Connecticut and Massachusetts employ Integrated Vegetation Management (IVM) practices including the use of herbicides.

In New Hampshire, only mowing or hand-cutting is employed and no herbicides are used to control targeted vegetation.

Contracting of work and review for compliance with NU specifications is addressed under M8-MT-3207 – *Transmission Vegetation Management Contract Administration and Quality Control*.

## 5.1.1. Development of Cyclical Program/Annual Projects

### *Supervisor – Transmission Vegetation Management*

- a. Develop a complete list of all right-of-way and right-of-way segments and compile this information into one list for each state. Right-of-Way segments will be grouped into contract projects so that the number of acres within each project is between 200 and 600 acres on-average. Projects will be grouped into four annual schedules with each year consisting of approximately 25% of the system acreage in each state. Right-of-Way line lists and workload updates are addressed under Administrative Procedure M8-MT-3201 – Transmission Vegetation Management System Workload Updates (See Attachment A for sample list).
- b. Annual workloads are determined using the cyclical schedules and adjustments made when right-of-ways are earmarked for capital improvements or construction projects that would prevent or delay the scheduled work and for addressing vegetation problems that need to be addressed before the next scheduled maintenance cycle. Adjustments made to the annual schedule result in changes in the four-year cyclical schedule in order to stay on target with the projected annual work loads and budgets. Annual schedules may be adjusted if inspections show that vegetation conditions warrant corrective actions within the next year.

Development of the annual work schedules are addressed under Administrative Procedure M8-MT-3208 – *Transmission Vegetation Management Annual Workload Development*.

## 5.1.2. Development of Contract Projects

### *Supervisor – Transmission Vegetation Management/Transmission Arborists/Transmission Contract Administration*

Right-of-Way brush projects scheduled for maintenance are previewed by foot patrols and inspections are conducted by VM Transmission Arborists in the summer prior to the contract year.

- Arborists note any conditions that have changed over the past cycle as well as review the project for any hazard tree conditions
- Arborists update structure sheets noting sensitive areas, access points and access locations as well as any property owner who requires special notification in advance of the work
- Special Conditions in the contract are developed noting specific conditions that must be addressed for each project
- Project maps are developed noting the location of all lines covered by each project
- Hazard tree conditions identified during pre-contract reviews conducted by Transmission Arborists are noted in the file for the listing and compilation of hazard tree work and addressed under the Hazard Tree Program in Section 4.4.

Updated structure lists, Section II's and maps identifying the areas to be maintained are compiled and provided to the Supervisor – TVM for incorporation into the contract documents.

Complete contract packages with all required supporting documents and approved vendor lists are forwarded to Transmission Contract Administration for Senior Management approval and submission to Purchasing.

### 5.1.3. Contracting of Projects

*Transmission Contract Administration/Purchasing/Supervisor – Transmission Vegetation Management*

*NOTE: The contracting of all transmission vegetation management projects follows approved Northeast Utilities procurement guidelines and procedures.*

The contracting process for all transmission vegetation management activities is performed in the following manner:

- Contract Administration provides complete contract packages to Purchasing
- Purchasing enters contract documents into Frictionless
- Contractors are sent information on contract process in Frictionless, the NU purchasing application.
- Contractors attend annual pre-bid meeting to review specification changes and scope of work
- Contractors submit bid quotes and/or rates in Frictionless
- Bid quotes and rates are forwarded to Transmission Contract Administration and Supervisor – TVM for review
- Successful vendors are selected and the rationale for the selection is provided to Purchasing
- Purchasing finalizes contract quotes and rates with successful Contractor(s)
- Transmission Contract Administration develops Material Requests, routes them to the appropriate approvers, and forwards them to Purchasing
- Purchasing receives approved Material Requests and issues Purchase Orders
- Supervisor – TVM creates lists of all vendors noting the projects awarded, purchase order numbers and purchase order limits and tracks expenditures against each individual order limit

### 5.1.4. Performance of Work

*Transmission Arborists/Contractor*

The following is a stepwise process for the performance of all contracted brush maintenance work.

- Contractor management provides a schedule on project execution with start and end dates for each segment of the work in advance of the work being performed
- Contractor employees perform visual inspection of all right-of-way areas to identify and note possible hazard tree conditions and report these locations to the respective Arborist

- Contractor performs property owner pre-notification of upcoming maintenance work to all right-of-way abutters
- If project is a two-pass method (e.g.: Connecticut and Massachusetts):  
Contractor performs initial prep-cutting activities along entire project with all cutting completed before June 1<sup>st</sup> of each year  
Contractor then performs second maintenance pass using foliar applied herbicides in late summer/early fall
- If project is a one-pass method (e.g. NH mowing):  
Contractor performs all work (mowing, cutting or cutting and treating) at one time
- Contractor submits time sheets on a weekly basis to the respective Transmission Arborist identifying sections worked, hours of labor and equipment, amount of materials used (herbicide mixtures) and number of acres maintained.
- Contractor management performs final review of work completed and informs Transmission Arborist for final review and invoicing approval

### 5.1.5. Review of Work and Documentation

#### *Transmission Arborists/Contractor*

Work completed is reviewed and approved or rejected by the Transmission Arborist with deficiencies noted for corrective actions by the Contractor. Work completed in accordance with the contract requirements and NU specifications is approved and dates of the inspections for acceptance are documented in project files. The steps in this process are:

- Contractor informs Transmission Arborist that work has been completed and reviewed by Contractor management
- Transmission Arborist performs review of work completed and notes any problems or deficiencies.
- Transmission Arborist completes review file using color-coded system to denote areas that are acceptable, need minor work or are not acceptable based on contract specifications and results obtained
- Transmission submits review report to contractor for follow up if necessary
- Contractor performs corrective actions and provides completion report to Transmission Arborist
- Arborist makes final review of areas where additional work was required and signs project off as completed once final inspection is approved

## 5.2. Rights-of-Way Side Trimming and Clearing

Right-of-Way Side Clearing and Trimming involves the cyclical management of vegetation (trees) along the right-of-way edge to provide a set level of clearance between trees/branches and the conductors and immediately beyond the edge to address hazard trees that may impact the overhead facilities if they were to fail. Clearance distances obtained at the time of maintenance conform to ISO-NE – OP3 standards and are listed under Attachment C – *Clearance Level 1 Distances*. Each year approximately 10% of the system right-of-way mileage is managed to trim trees along the edge to established minimum clearances and to remove any identified hazard trees along or beyond the right-of-way edge.

Contracting of work and review for compliance with NU specifications is addressed under Administrative Procedure M8-MT-3207 – *Transmission Vegetation Management Contract Administration and Quality Control*.

All work is performed by contract vendors and all work is scheduled and performed within one calendar year.

### 5.2.1. **Development of Cyclical Program/Annual Projects**

*Supervisor – Transmission Vegetation Management/Transmission Arborists*

- a. With assistance from the Transmission Arborists, develop a complete list of all right-of-way and right-of-way segments. The amount of exposed mileage along the length of all right-of-way segments will be tabulated to provide a baseline of the total amount of mileage to manage on the system. Right-of-way segments will be listed by state according to operating voltages and the total amount of right-of-way side miles for each voltage class totaled in the system base workload listing. Workload updates are addressed under Administrative Procedure M8-MT-3201– *Transmission Vegetation Management System Workload Updates* (See Attachment B for sample list).
- b. Annual workloads are determined using the cyclical schedule and adjusted when proposed capital improvements or construction projects would impact the scheduled work or when vegetation problems require adjusting schedule to address problem areas. Approximately 10% of the total mileage in each state is scheduled for each year.

Development of the annual work schedules are addressed under Administrative Procedure M8-MT-3208 – *Transmission Vegetation Management Annual Workload Development*.

### 5.2.2. **Development of Contract Projects**

*Supervisor – Transmission Vegetation Management/Transmission Arborists/Transmission Contract Administration*

Right-of-Way side trimming projects selected for maintenance are field checked by the Transmission Arborists in the year prior to the scheduled maintenance.

- Arborists perform a detailed span by span review of each line segment noting the amount of tree exposure as a percentage of span length as well as the current tree to conductor conditions (relative distances)
- Arborists or contractor notification specialists perform property owner notification on work required and note any specific requirements for wood disposal
- Arborists update trimming structure sheets with the review information identifying sensitive areas, crew type and equipment required, access points and access locations as well as property owners who request special needs in advance of the work
- Contract Section II's – Special Conditions are developed noting specific conditions that must be addressed within each project
- Project maps are developed noting the location of all lines covered under each project

Updated trimming structure lists, Section II's and maps identifying the areas to be maintained are compiled and provided to the Supervisor – TVM for incorporation into the final contract documents.

Complete contract packages with all required documents and approved vendor lists are forwarded to Transmission Contract Administration and Purchasing for Senior Management review and approval.

### 5.2.3. Contracting of Projects

*Transmission Contract Administration/Purchasing/Supervisor – Transmission Vegetation Management*

*NOTE: The contracting of all transmission vegetation management projects follow approved Northeast Utilities procurement guidelines and procedures.*

The contracting process for all transmission vegetation management activities is performed in the following manner:

- Contract Administration provides complete contract packages to Purchasing
- Purchasing enters contract documents into Frictionless
- Contractors are sent information on contract process in Frictionless
- Contractors submit bid quotes and/or rates in Frictionless
- Bid quotes and rates are forwarded to Transmission Contract Administration and Supervisor – TVM for review
- Successful vendors are selected and the list of successful vendors is provided to Purchasing along with the rationale
- Purchasing finalizes contract quotes and rates
- Transmission Contract Administration develops Material Requests, routes them to the appropriate approvers, and forwards them to Purchasing
- Purchasing receives approved Material Requests and issues Purchase Orders

- Supervisor – TVM creates a list of all vendors – projects awarded, purchase order numbers and purchase order limits and tracks expenditures against individual order limit

#### **5.2.4. Performance of Work**

##### *Transmission Arborists/Contractor*

The following is a stepwise process for the performance of all contracted side trimming maintenance work.

- Contractor management provides schedule on project performance with start and end dates for each segment in advance of the work unless NU has specified the start and end dates as part of the contract requirements.
- Contractor performs required work as listed in the project documents and provides weekly updates of work completed
- Contractor submits time sheets on a weekly basis identifying sections worked, hours worked, number of crew personnel as well as equipment, amount of materials used (herbicide mixtures) and number of trees trimmed and/or removed
- Transmission Arborists review completed work and track work progress and costs for internal reporting on Key Performance Indicators (KPIs)

#### **5.2.5. Review of Work and Documentation**

##### *Transmission Arborists/Contractor*

Completed work is reviewed and approved or rejected by Transmission Arborists with deficiencies noted for corrective actions by the Contractor. Work completed in accordance with the contract requirements and NU specifications is approved and review dates and acceptance documented in project files.

- Contractor informs Transmission Arborist that work has been completed and reviewed by Contractor Management
- Transmission Arborist performs review of work completed and notes any problems or deficiencies.
- Transmission Arborist completes a review using a color-coded system to denote areas that are acceptable, need minor work or are not acceptable based on contract specifications and results observed
- Transmission Arborist submits the review to contractor for follow up or supplemental work if necessary
- Contractor performs corrective actions and provides completion report to Transmission Arborist
- Arborist makes final review of areas where additional work was required and signs project off as completed once final inspection is approved

## 5.3. Vegetation Management Inspections

The Vegetation Management Section performs routine, scheduled reviews of all rights-of-way to identify any hazard or danger tree conditions that require immediate attention. Annually, the VM Section performs aerial inspections of all facilities in excess of 200kV as well as lower voltage facilities identified as NU system critical.

Ground inspections are performed on all projects as a preview of the work to be performed under brush maintenance or side trimming projects in the year prior to the maintenance year.

All inspections conform to the requirements in Administrative Procedure M8-MT-3203 – *Transmission Vegetation Management System Inspection Program*.

### 5.3.1. **Development of Inspection Schedule**

*Supervisor – Transmission Vegetation Management*

The Supervisor – Transmission Vegetation Management will develop a complete list of all right-of-way and right-of-way segments for the NU system and note the inspection requirements (annual, once every four years, etc.). The inspection schedule will be finalized for each year noting any changes in the scope of work on any line or right-of-way segment.

### 5.3.2. **Aerial Inspections**

*Supervisor – Transmission Vegetation Management/Transmission Arborists*

All facilities in excess of 200kV (NPCC Critical) as well as all lower voltage facilities designated as NU system critical are scheduled for aerial inspections. Aerial inspections are conducted on a state by state basis. Aerial inspections are generally performed during the months of August and September of each year.

- Arborists perform aerial inspections and note any locations where there appears to be potential vegetation problems
- Arborists perform ground inspections of all possible problems identified during aerial reviews
- Hazard or danger tree conditions are noted and recorded in the Hazard Tree listing for each year for and addressed under the Hazard Tree Program
- Arborist update inspection lists noting the completion date of each circuit inspected

Aerial inspections may also be scheduled prior to leaf out in the spring to identify any tree damage from winter weather occurrences.

### **5.3.3. Ground Inspections**

*Supervisor - Transmission Vegetation Management/Transmission Arborists*

Arborists perform field inspections of all upcoming project work including brush maintenance and side trimming projects to identify any hazard or danger tree conditions.

- Arborists note hazard or danger tree problems during inspections (ground or aerial)
- Hazard or danger tree problems are recorded in the Hazard Tree listing for each year and addressed under the Hazard Tree Program
- Arborist update the inspection schedule and note the completion date for the ground inspections of each facility and non-complaint location

## **5.4. Hazard Tree Program**

Hazard or danger trees are trees that pose an imminent threat of failing (falling or breaking) and contacting the overhead facilities. Annually, a list is developed noting all hazard or danger trees that have been identified through the various patrols. The list is used to compile project packages by circuit, project or geographic area. The list is provided to contract tree crews for corrective actions.

The process for identification and addressing hazard tree situations is detailed in Administrative Procedure M8-MT-3204 – *Transmission Vegetation Management Hazard Tree Program*.

### **5.4.1. Development of Hazard Tree Listing**

*Supervisor – Transmission Vegetation Management/Transmission Arborists*

The Supervisor – Transmission Vegetation Management will develop a file for the recording of all hazard or danger tree locations for each calendar year. The list will note the circuit, structure locations, problem condition and the type of crew required to perform the work (climbing, bucket, etc.). The list will be used to compile project packages for corrective actions during the calendar year.

### **5.4.2. Recording of Hazard Tree Location**

*Supervisor – Transmission Vegetation Management/Transmission Arborists*

Arborists will perform ground reviews of all hazard tree locations identified during aerial or ground inspections by the VM Section as well as vegetation problems recorded in the Cascade System from Line Maintenance inspections

- Arborists record the information required for the Hazard Tree Listing file noting the problem condition and the crew type required to perform the work

- Arborists perform notification of property owners or people whose property abuts the Rights of Way to inform them of the required work and note that approval or permission has been obtained for the Hazard Tree Listing
- Arborists enter all data for the locations of problem trees in the Hazard Tree Listing file
- Arborists review the Hazard Tree Listing file and compile work packages that includes numerous hazard tree locations based on geographic proximity and crew type

### **5.4.3. Performance of Hazard Tree Work**

*Supervisor – Transmission Vegetation Management/Transmission Arborists*

Contractors approved for work during the calendar year are used as a pool of resources (crew type and equipment) that will be used to perform the hazard tree work. All work is performed using contract tree crews.

- Contractors and contractor crews are selected to receive hazard tree work packages based on their abilities to perform the work, availability and hourly rates
- Contractors are provided hazard tree work packages
- Contractors perform the work and record all information on hours or labor and equipment used as well as the number of trees trimmed and/or removed on weekly time sheet
- Contractors submit weekly time sheets with total costs to the Transmission Arborists as well as listing of all locations where hazard tree work was completed

### **5.4.4. Review of Work and Documentation**

*Supervisor – Transmission Vegetation Management/Transmission Arborists*

As part of the effort to track the effectiveness of the Hazard Tree Program, the following process is followed for completed hazard tree work:

- Arborists receive time sheets and completion lists for hazard tree work from contractors on a weekly basis
- Arborists enter the weekly invoice costs for each crew in the Hourly Work tracking file noting the crew foreman, the week-ending date, the total costs and the numbers of trees trimmed and removed
- Arborists perform review of work performed to ensure that all work was completed as required
- Deficient work is noted and contractor is informed of additional work
- Once work is accepted by the Vegetation Management Section – the Arborists update the Hazard Tree Listing File and enter completion dates for each location where the work was performed

## 5.5. Investigating and Reporting Vegetation Caused System Disturbances

System disturbances that are the results of vegetation contact require review by the Vegetation Management Section and depending on the type of system disturbances (trip and reclose or line outage) require reports to the various regulatory agencies overseeing transmission operations.

The process for investigating and reporting on vegetation-caused disturbances is detailed in Administrative Procedure M8-MT-3206 – Transmission Vegetation Management Reporting Vegetation-Caused Disturbances.

### 5.5.1. **Investigation of Vegetation-Caused System Disturbances**

*Supervisor – Transmission Vegetation Management/Transmission Arborist*

For each vegetation-caused system disturbance, an investigation is conducted by the Vegetation Management Section to note the various factors that resulted in the contact. The process for performing and recording these investigations is as follows:

- The Supervisor - Transmission Vegetation Management is informed of a vegetation-caused system disturbance on the NU System
- The Supervisor – TVM obtains operation information from CONVEX (Connecticut and Massachusetts) or the ESCC (New Hampshire)
- Field investigation is performed by the VM Section to identify the cause and note the situation or factors that led to the contact
- The Arborist completes the “Northeast Utilities System Transmission Vegetation Management Vegetation-caused Interruption/Operation Report” and when possible – provide pictures of the problem
- Arborist submits the investigation report and associated documents to the Supervisor – TVM for recording purposes.

#### 5.5.1.1. **Reporting Requirements for ISO-NE**

*Supervisor - Transmission Vegetation Management*

- Incidents of vegetation causing an operation on any facility in excess of 200kV will require that an investigation report be submitted to ISO-NE upon completion of the investigation using the “NPCC Reliability Compliance Program Exception Report Form for Vegetation Related Outages”
- Incidents of vegetation causing an outage on any facility in excess of 200kV will require that an investigation report be submitted to NPCC upon completion of the investigation using the “NPCC Reliability Compliance Program Exception Report Form for Vegetation Related Outages”
- Vegetation related incidents that result in a sustained line outage on any facility with operating voltages less than 200kV will have the investigation reports submitted through the Supervisor – TVM to ISO-NE upon completion of the investigation

- Vegetation related incidents that result in the trip and reclosure of any facility less than 200kV will be reported to ISO-NE on a monthly basis using the "ISO-NE Vegetation Outage Report"

### 5.5.1.2. Reporting Requirements for NPCC

#### *Supervisor - Transmission Vegetation Management*

- Incidents of vegetation causing an outage on any facility in excess of 200kV will require that an investigation report be submitted to NPCC upon completion of the investigation using the "NPCC Reliability Compliance Program Exception Report Form for Vegetation Related Outages
- Quarterly, provide report on vegetation-caused outages on NERC critical facilities for each operating company to Transmission Reliability Compliance Section for submission to NPCC. Completed NPCC FAC-003-1 Quarterly Vegetation Outage LOC form and provide one form for reporting information for each operating company.

### 5.5.1.3. Corrective Actions

#### *Supervisor - Transmission Vegetation Management*

- Incidents that are the result of conditions that could be corrected and not currently addressed under any vegetation management process will require an investigation into options to implement corrective actions to prevent similar incidents
- Incidents that qualify for corrective actions will have the mitigation plans detailing the corrective actions included in the reports to ISO-NE when the incidents occur on facilities greater than 200kV
- Programs that can be implemented to prevent vegetation-caused operations will be incorporated into the vegetation management programs and addressed under a new process

## 5.6. Communicating System Emergency Conditions

Vegetation situations that present an imminent threat to the transmission system shall be immediately communicated to the appropriate personnel and organizations.

The process for communicating and addressing these situations is detailed in Administrative Procedure M8-MT-3205 – Transmission Vegetation Management System Emergency Condition Communication Process.

#### *Supervisor – Transmission Vegetation Management/Transmission Arborists*

- Emergency vegetation conditions shall be identified and reported to the Supervisor - TVM
- The Supervisor will note the problem and forward the information to the Manager – TL&CS, Director – TM&WM and the appropriate Operating Center (Convex or ESCC).
- The Operating Center will implement operational restrictions if the problem could result in a line outage and have an impact on current system operations.

- Immediate actions will be taken by the TVM section to correct the problem and remove the operational restrictions if implemented.

## 5.7. Mitigation Measures for Non-Compliant Vegetation Conditions

In areas where the minimum clearances listed under Clearance 1 cannot be obtained during routine cyclical maintenance – conditions must be documented and inspected to ensure vegetation does not violate clearances listed under Clearance 2. Inspections are performed to monitor conditions and corrective actions are implemented when conditions exceed minimum thresholds.

### 5.7.1. **Documentation of Non-Compliant Conditions**

*Transmission Arborists*

- Identify locations where Clearance 1 distances cannot be obtained under maintenance clearing or trimming
- Update project files to note location and non-compliant vegetation conditions
- Enter data into system file for non-compliant locations

### 5.7.2. **Annual Inspection of Non-Compliant Conditions**

*Supervisor - Transmission Vegetation Management/Transmission Arborists*

- Review system non-compliant file for accuracy and completeness
- Annually, perform a visual inspection of each location listed to ensure clearances are adequate for the upcoming year by the end of January each year.
- Update system non-compliant file with the date when inspections were completed for each location
- Areas that will not conform to the minimum distances listed under Clearance 2 will be noted and scheduled for corrective actions

## 5.8. Self-Certification of Vegetation Management Activities

*Supervisor - Transmission Vegetation Management/Director – Transmission Maintenance and Work Management*

Annually, Northeast Utilities must certify that all vegetation management work scheduled for the year has been completed as scheduled and that all activities conform to the requirements for Transmission Vegetation Management Programs under ISO-NE and NPCC requirements. The self-certification forms will be signed and submitted by the Director- Transmission Maintenance and Work Management for NU

- The Supervisor – TVM will compile annual summaries of all work performed under the vegetation management program for the year
- All work completed that conforms with the annual work plan will be noted and any areas where work did not conform with the annual schedule will also be noted with explanations as to why the work was not completed
- The annual report summary will be submitted to the Director – Transmission Maintenance and Work Management for review
- The Director – Transmission Maintenance and Work management will complete the self-certification forms and note any areas where NU was not compliant in the completion of the annual work
- The Director – Transmission Maintenance and Work Management will submit the self-certification reports to the respective operating authorities (NPCC and ISO-NE)

## 6. Administrative Information

### 6.1. Requirements

#### 6.1.1. Federal Regulatory Requirements

- a. North American Electric Reliability Council (NERC) Transmission Vegetation Management Program Standard FAC-003-1
- b. Northeast Power Coordinating Council (NPCC) Vegetation Management Program Compliance Requirements (not numbered)
- c. American National Standards Institute (ANSI) Z-133.1 and A300

#### 6.1.2. Regional Regulatory Requirements

- a. Independent System Operator – New England (ISO-NE) Operating Procedure OP3 – Appendix 3-D1
- b. *Independent System Operator – New England (ISO-NE) Operating Procedure OP3 – Appendix B*

#### 6.1.3. Connecticut Regulatory Requirements

- a. Connecticut State Statutes – Section 22a-66a – Notification of the Application of Pesticides. Registry. Regulations. Penalties
- b. Connecticut State Statutes – Section 22a-66k – Utilities Pesticide Management Plan

#### 6.1.4. Massachusetts Regulatory Requirements

- a. Code of Massachusetts Regulations – 333 CMR 11:00 – Rights-of-Way Management

#### 6.1.5. New Hampshire Regulatory Requirements

- a. New Hampshire Code of Administrative Rules – RSA 430:33 – Pesticide Applicator Registration Certificates and Permits
- b. New Hampshire Code of Administrative Rules – RSA 430 – Part Pes 501 and Pes 505

## 6.2. References

### Northeast Utilities Specification for Rights-of-Way Vegetation Management – Revision 2008

- "Northeast Utilities System Transmission Vegetation Management Vegetation-caused Interruption/Operation Report"
- "NPCC Reliability Compliance Program Exception Report Form for Vegetation Related Outages"
- "NPCC FAC-003-1 Quarterly Vegetation Outage LOC"
- TD-509, "Transmission Line Inspection and Maintenance"
- "ISO-NE Vegetation Outage Report"

### Northeast Utilities Transmission Group Program Description – Transmission Maintenance Program Manual (TPPM) M2-AM-1101

#### Northeast Utilities Transmission Group Administrative Procedures

- Administrative Procedure M8-MT-3201 – Transmission Vegetation Management System Workload Updates
- Administrative Procedure M8-MT-3208 – Transmission Vegetation Management Annual Workload Development
- Administrative Procedure M8-MT-3203 – Transmission Vegetation Management System Inspection Program
- Administrative Procedure M8-MT-3204 – Transmission Vegetation Management Hazard Tree Program
- Administrative Procedure M8-MT-3205 – Transmission Vegetation Management System Emergency Vegetation Communication Process
- Administrative Procedure M8-MT-3206 – Transmission Vegetation Management Reporting Vegetation-Caused Disturbances
- Administrative Procedure M8-MT-3207 – Transmission Vegetation Management Contract Administration and Quality Control
- Administrative Procedure M8-MT-3209 – Transmission Vegetation Management Mitigation Process

## 7. Summary of Changes

### Revision 1

Included section on Administration to address TVM Organization and position requirements

Changed "Patrols" to "Inspections" in all areas of document

Added Attachment showing the minimum clearance distances between vegetation and energized conductors.

Included references to other TVM Procedures for each activity

### Revision 2

Republished document to correct the PDF file in the archived database and to populate the Regulated Document database.

### Revision 3

Included additional clearance distances under Attachment C to comply with R1.2.2 and R1.2.2.1.

Included section on mitigation process for areas where vegetation is not in compliance with the minimum clearances listed under Clearance 1 distances in Attachment C.

### Revision 4

Added additional detail to section 5.5.1.

Added additional detail to Appendices.

### Revision 5

Addition of Line Clearance Contractors under Section 3

Modified reporting requirements for NPCC and ISO to comply with new procedure and required forms in Section 5.5.1.1. and 5.5.1.2.

Added section on training for TVM personnel under Section 4 – Program Administration Other minor edits to Program Administration section 4.

# Attachment A, 2006 Transmission Vegetation Management Annual Schedule

## 2006 Transmission Vegetation Management Annual Schedule

### Connecticut

Project Number	Last Treated	Next Scheduled	Maint. Acres	Project Description
CT-01	2002	2006	479.8	Plumtrees -Steverson - Frost Bridge - Bunker Hill/Baldwin/Naugatuck/Beacon Falls/Freight Street
CT-29	2002	2006	826.9	N. Bloomfield - Weingart Junction - Franklin Drive - Thomaston - Chippen Hill
CT-30	2002	2006	204.4	N. Bloomfield - Agawam/Southwick
CT-31	2002	2006	471.6	Manchester - Hopewell - Portland - CT River
CT-32	2002	2006	616.3	Middletown - East Haddam Junction - Oxbow Junction - P&W/Haddam Neck/CT Yankee
CT-33	2002	2006	202.5	Willimantic - Wawecus Junction
CT-34	2002	2006	518.3	Montville - Wawecus Junction - Tunnel - Montville
CT-35	2002	2006	308	Tunnel - Day Street Jct.
CT-36	2002	2006	83.8	Ash Creek - Cos Cob ( One-half side trimming/tree removals)
CT-09	Capital		101	
CT-XX	2002	2006	35	Card - RI (Mowing on Donner Property)
<b>Total</b>			<b>3847.6</b>	

### Massachusetts

Project Number	Last Treated	Next Scheduled	Maint. Acres	Project Description
WT-01	2000	2006	363	Berkshire - Ashfield
WT-02	2002	2006	339	Berkshire - Doreen - NEPCo - New York Line
WT-03	2002	2006	535	Northfield - Cumberland - Ashfield
<b>Total</b>			<b>1237</b>	

### New Hampshire

Project Number	Last Treated	Next Scheduled	Maint. Acres	Project Description
NH-02	2002	2006	1104	363, 373, 385, 391
NH-03	2001	2006	952	363, 394, B-172, C-131, H-141, R-193
NH-05	2001	2006	146	381
NH-18	2002	2006	244	F-162
NH-20	2002	2006	416	B-112
NH-23	2001	2006	241	Q-195
NH-25	2002	2006	78	X-116
<b>Total</b>			<b>3181</b>	

# Attachment B, Transmission Right-of-Way Project Listing (sample list)

## Transmission Right-of-Way Project Listing

Connecticut

Circuit Miles and Trimming Mileage

Revised 04/24/2006

Connecticut Summary	Circuit Miles	Trim Miles	ROW Miles
345kV	401.12	423.3	
115kV	1132.35	1119	
69kV	96.45	112.23	
<b>Totals</b>	<b>1629.92</b>	<b>1654.53</b>	<b>827.265</b>

Voltage	Line No.	State	Description	Circuit Miles	Trim Sides	Trim Miles	Trim Year
345	310	CT	Manchester Junction - Village Hill Junction	17.75	1	17.75	2005
345	310	CT	Millstone - Huntsbrook Junction	8.99	0	0	2005
345	310	CT	Huntsbrook Junction - Village Hill Junction	19.77	1	19.77	
345	310	CT	Manchester S/S - Manchester Junction	2.93	0	0	
345	321	CT	Long Mountain - Rocky River	3.32	1	3.32	
345	321	CT	Rocky River - Plumtrees	14.45	1	14.45	
345	329	CT	Southington - Frost Bridge (329)	12.52	2	21.9	
345	330	CT	Stetson Road - Lake Road	11.1	2	22.2	
345	330	CT	Card - Stetson Road	27.83	2	55.66	
345	347	CT	Lake Road - Sherman Rd.	7.4	2	14.8	
345	348	CT	Huntsbrook Junction - East Haddam Junction	16.04	0	0	
345	348	CT	Millstone - Huntsbrook Junction	8.99	1	8.99	2006
345	348	CT	Black Pond Junction - Southington	9.05	1	9.05	
345	348	CT	Oxbow Junction - Black Pond Junction	9.75	1	2.15	
345	348	CT	East Haddam Junction - Oxbow Junction	9.52	1	9.52	
345	352	CT	Carmel Hill - Long Mountain	5.38	1	5.38	
345	352	CT	Frost Bridge - Carmel Hill	9.87	1	9.87	
345	353	CT	Connecticut River - Manchester S/S	17.9	1	20.73	
345	353	CT	Scovill Rock - Middletown Junction	3.1	1	3.1	
345	362	CT	Southington - Black Pond Junction	9.05	1	9.05	
345	362	CT	Black Pond Junction - Scoville Rock	10.85	1	5.56	
345	362	CT	Scoville Rock - East Haddam Junction	8.69	1	8.69	
345	364	CT	Montville - Huntsbrook Junction	3.7	1	3.7	
345	364	CT	Huntsbrook Junction - East Haddam Junction	16.04	1	16.04	
345	364	CT	East Haddam Junction - Haddam Neck	3.49	1	3.49	
345	368	CT	Village Hill Junction - Manchester Junction	17.75	1	17.75	2005
345	368	CT	Card - Village Hill Junction	0.85	1	0.85	
345	368	CT	Manchester Junction - Manchester S/S	2.93	0	0	
345	371	CT	Huntsbrook Junction - Montville	3.7	0	0	
345	371	CT	Millstone - Huntsbrook Junction	8.99	0	0	
345	376	CT	Haddam Neck - Scovill Rock (376)	5.2	0	0	

Transmission Vegetation Management

Administrative Procedure

345	383	CT	Millstone - Huntsbrook Junction	8.99	1	8.99	2006
345	383	CT	Huntsbrook Junction - Card	18.6	1	18.6	
345	387	CT	East Shore - Totoket Junction				
345	387	CT	Totoket Junction - Carpenter Lane	13.51	2	19.56	
345	387	CT	Carpenter Lane - Black Pond Junction	2.12	2	2.89	
345	387	CT	Black Pond Junction - Scoville Rock	10.85	1	10.85	
345	395	CT	Barbor Hill - Connecticut Line (Ludlow)	13.95	2	23.98	2006

## **Attachment C, Transmission Vegetation Clearances**

### Clearance 1 Distances

<u>Voltage</u>	<u>Side Clearance</u>	<u>Under Clearance</u>
69kV	20 feet	11 feet
115kV	20 feet	11 feet
230kV	30 feet	15 feet
345kV	30 feet	15 feet

Clearances listed are the targeted clearances to be obtained at the time of maintenance.

### Clearance 2 Distances

<u>Voltage</u>	<u>Clearance</u>
69kV	2 feet
115kV	4 feet
230kV	6 feet
345kV	10 feet

Clearance 2 distances are the minimum clearances to be maintained at all times to prevent flashover under all operating conditions.

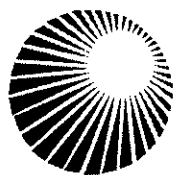
## Clearance 3 Distances

**IEEE Table 5 - Minimum Air Gap Distances**  
Transient over-voltage factors are not know

Voltage in kilovolts phase to phase	Phase to ground
72.6 - 121	2.46
138 - 145	2.95
161 - 160	3.44
230 - 242	5.15
345 - 362	9.45
500 - 550	14.69
765 - 800	20.47

Distances in feet

Clearance 3 distances are the minimum distances between energized conductors and vegetation where *transient over-voltage factors are not known*.



# Northeast Utilities System

## NORTHEAST UTILITIES SPECIFICATION FOR RIGHTS-OF-WAY VEGETATION MANAGEMENT

### SECTION III TECHNICAL REQUIREMENTS 2009

#### I. Scope

This specification covers the selective vegetation control of targeted undesirable tree, brush and vine species on Northeast Utilities transmission and distribution rights-of-way. Management of undesirable vegetation will be performed through the integrated use of manual, mechanical, chemical or other means as may be available to eliminate identified target species and remove potentially conflicting trees or tree parts from contact with the overhead conductors and/or electric facilities.

#### II. Objective

The primary purpose of rights-of-way vegetation control is to provide a clear and accessible area for the operation, review and maintenance of electric facilities located on the right-of-way. Reliability will be preserved through the removal of all potentially interfering tree, shrub and vine species that may, through normal growth, contact the overhead electric conductors or impede physical or visual access along the right-of-way. Vegetation species such as grasses, forbs, ferns and low growing shrubs are considered desirable and shall be preserved and encouraged to grow.

#### III. General

##### A. Maintenance Zones

The type of maintenance will be dictated by voltage of the conductors and the average width of the right-of-way on each project. There are two types of maintenance, a two zone system for higher voltage classes and/or wider rights-of-way and a one-zone system for lower voltages and/or narrow rights-of-way. The voltage class will be defaulted to the highest voltage on the right-of-way if the right-of-way is shared by more than one circuit or line.

The two maintenance systems are as follows:

**Two Zone System:** for rights-of-way widths greater than 100 feet.

**One Zone System:** for rights-of-way 100 feet or less in width

##### 1. Two-Zone Maintenance

Management of vegetation within right-of-way boundaries shall be performed in accordance with the two-zone maintenance concept for transmission voltage lines and rights-of-way in excess of 100 feet in width. A wire or conductor zone and a border or side zone shall be developed and maintained in accordance with these specifications.

**Wire Zone:** The wire zone shall include the area directly beneath the overhead conductors extending outward a distance of 15 feet from the outermost conductor(s).

**Side Zone:** The side zones shall include all areas from the 15-foot limit of the outermost conductor(s) to the edge of the right-of-way border or maintained area.

**2. One-Zone Maintenance**

Management of vegetation within right-of-way boundaries shall be performed for right-of-way widths of 100 feet and less. The entire width of the right-of-way is maintained as a Wire Zone in accordance with the management requirements listed under Section B.1..

**B. General Areas**

General areas will include all rights-of-way where the company owns the land encompassed by the rights-of-way in fee, where easement rights do not restrict the preferred maintenance method(s), or where physical features do not require a maintenance practice different than the preferred method(s).

**1. Wire Zones:** Normally, all tree species and selected undesirable shrub species (state-listed invasive shrub species) regardless of height at the time of maintenance will be controlled. Also, desirable shrub species that are greater than 8 feet in height at the time of maintenance may be controlled depending on location and physical conditions within the right-of-way or position relative to facilities (ie. terrain or large clearances due to heights of the overhead conductors). Selected invasive species as listed below will be eliminated on all areas of the right-of-way regardless of height. All hardwood tree species will be treated standing or cut and treated if stems exceed 12 feet in height. All conifers less than 4 feet in height may be treated standing or cut, and all conifers taller than 4 feet in height shall be cut and diced. Cedar trees in excess of 8 feet generally will not be managed under this maintenance specification and the proper course of action for any cedar tree work will be noted in the Special Conditions (Section II). (See Appendix 1 for a partial listing of desirable shrubs)

**2. Side Zones:** Normally all tree species (except cedar trees) and listed invasive plant species will be controlled. All other shrub species regardless of height may remain where practical. (See Appendix 1 for a listing of the desirable species for side zones)

**Requirements for control may be modified to take into consideration topographical features such as valleys, gorges and steep slopes that result in large clearances from the overhead conductors, or where certain target species may be retained to provide barriers to the right-of-way or where visual aspects may limit the use of herbicides. These locations and modifications will be listed in Section II.**

**3. Invasive Species Control:** Invasive species to be controlled within the entire maintained areas include the following species:

Multiflora Rose	<i>Rosa multiflora</i>
Common Buckthorn	<i>Rhamnus cathartica</i>
Glossy Buckthorn	<i>Frangula alnus</i>
Autumn Olive	<i>Elaeagnus umbellata</i>
<b>Russian Olive</b>	<b><i>Elaeagnus augustifolia</i></b>
<b>Japanese Barberry</b>	<b><i>Berberis thunbergii</i></b>
<b>Common Barberry</b>	<b><i>Berberis vulgaris</i></b>

**C. Sensitive Areas**

Sensitive areas are those areas where the preferred maintenance method used for general areas cannot be used and must be modified or altered to obtain the desired control. Sensitive areas shall include but are not limited to:

- Residential areas (yards)
- Public water supply watersheds

- Public or private well locations
- Stream or river crossings
- Wetlands (wet)
- No chemical areas

Additional information provided in the contracts for each listed project will contain information where environmentally sensitive areas or areas where maintenance requirements must be modified due to location or property owner concerns will be listed on the structure sheets. All contractors are required to adhere to any restrictions or requirements that have been identified on the structure sheets for each project.

All target species identified in Section III. B. shall be controlled in these areas when possible. Herbicide applications may be performed unless the easement specifically restricts the use of chemicals. In areas where herbicide use is restricted or where herbicide use should be excluded, all target vegetation shall be cut and diced or chipped.

Within the sensitive areas, herbicide applications shall be restricted from the following areas:

#### **CONNECTICUT**

- Within 100 feet of a public water supply well
- Within 50 feet of a private well
- Within wet wetland areas (10 feet from standing water)
- Within 10 feet of a river, stream or other body of water

#### **MASSACHUSETTS**

- Within any identified Zone I public water source
- Within 400 feet of a public water supply well
- Within 100 feet of a Class A public surface water supply
- Within 100 feet of a tributary that runs within 400 feet of any Class A public surface water supply
- Within 10 feet of a tributary that exists beyond 400 feet of any Class A public surface water supply
- Within 100 feet for 400 hundred feet upstream of both sides of a river of a Class B public surface water supply intake
- Within 50 feet of a private well
- Within wet wetland areas (10 feet from standing water)
- Within 10 feet of a river, stream or other body of water
- Within 10 feet of any Certified Vernal Pool

#### **NEW HAMPSHIRE**

- Within public water supply watersheds without a state permit
- Within 50 feet of any public well
- Within 400 feet of a gravel packed well or 250 feet of a drilled well used for public water supply without a state permit
- Within 50 feet of a private well
- Within wet wetland areas (25 feet from standing water)
- Within 25 feet of a river, stream or other body of water

#### **D. Access and Structures**

Existing access roads along rights-of-way including existing access to structures shall be cleared of all woody vegetation and where practical and herbicide treated to a minimum width of 14 feet.

Structures shall be cleared of all woody vegetation (including vines) and where practical, herbicide treated to a radius of 15 feet around each structure.

Guys shall be cleared of all woody vegetation (including vines) and where practical, herbicide treated to a radius of 5 feet at the anchor location. All vegetation in contact with the guy wire shall be herbicide treated or cut and removed. **Vines in contact with structures or guy wires shall be cleared manually if the vines have grown to at least 25% of the height of the structure or guy wire and all cut stumps of vines treated with an approved cut-surface herbicide mixture. Vines less than 25% may be controlled using foliar applications if herbicide use is not restricted.**

All stumps resulting from the cutting or mowing of standing vegetation shall be as low as practical around structures, guys and access areas and shall not exceed 3 inches in height.

**IV. Maintenance Methods**

**A. Herbicide Applications**

All target vegetation may be chemically treated using one or more of the following methods:

- High Volume Foliar (Must be specifically listed in bid proposal and locations noted)
- Low Volume Foliar
- Ultra-low Volume Foliar
- Low Volume Basal
- Cut & Stump Treatments

Applications directly to soil or the ground as well as non-selective broadcast applications or high volume basal applications shall not be used on the Northeast Utilities system.

The following herbicide materials are approved for use on the Northeast Utilities system:

**FOLIAR APPLICATIONS**

- ESCORT\* High and low volume
- ARSENAL\* High and low volume
- VANQUISH High and low volume
- ACCORD\* High and low volume
- KRENITE S\* High and low volume
- MILESTONE VM High and low volume

**BASAL APPLICATIONS**

- GARLON 4 Low volume basal
- STALKER Low volume basal

**CUT SURFACE APPLICATIONS**

- ACCORD\* (50/50 with water)
- STALKER (with water - use labeled rates)
- ARSENAL\* (with water - use labeled rates)
- KRENITE S\* (50/50 with water)
- PATHWAY
- GARLON 4# (in basal oil - use labeled rates)
- PATHFINDER

\* Sensitive area approved herbicide for Massachusetts

# Sensitive area approved herbicide for Massachusetts - application by sponge only

Foliar applications may employ a mixture containing two or more of the approved materials listed above. Basal applications shall employ a diluent labeled and approved for basal oil applications.

**B. Manual Cutting**

Manual cutting shall be employed when target stems exceed 12 feet in height or in sensitive areas where foliar or basal applications are not acceptable. All stumps resulting from the cutting of hardwood trees and shrub species including pitch pine shall be treated with an approved cut-surface herbicide where allowed. All stumps shall be less than 3 inches in height and all slash shall be wind-rowed along the right-of-way edge or diced in general areas. In sensitive areas, slash shall be diced, chipped or removed from the right-of-way depending on the physical locations.

Cut cherry trees in active pasture areas will be removed from the pasture immediately after cutting during the growing season and diced in an appropriate area of the right-of-way outside of the active pastures. Note: 2008-255 wilted cherry leaves are highly toxic to most livestock.

Diced or piled slash shall not be left within access areas or within the cleared areas around structures and guys. Slash and debris shall also be kept out of water courses, stream and river banks and bodies of water including standing water in wetland areas.

Trees or tree branches that are in close proximity to the conductors or are visibly damaged, dead or diseased and pose a threat to the conductors will be identified as "danger trees" and will be cut and/or removed when required by the Owner's Representative.

**C. Mechanical Mowing**

Mowing may be performed when necessary to reduce the heights of large dense stands of undesirable vegetation in preparation for an herbicide application or where herbicide applications are restricted. Mowing shall be selective in that large patches of low-growing desirable vegetation shall be retained where practical. Mowing shall be limited to wire zone areas, for access roads along the rights-of-way, or around structures and guys. However, limited mowing of side zones may be allowed to reduce dense stands of target vegetation. Mowing may only be performed after the review and approval of the Owner's Representative. Except in non-chemical areas, mowing shall be followed up with an herbicide application to the target stumps or resprouts.

The resulting stubble from mowing operations shall be as low as practical depending on the densities and terrain.

Prior to mowing any areas patrols by foot must be made in advance of all areas to be mowed and the following tasks performed in advance of mowing:

- Identification of all obstructions or fixtures that could impact the mowing equipment (fences, rocks, boulders, ledges, standing water, wetlands or unstable ground)
- Manually cut and clear to a distance of at least 5 feet around all guy wires, anchor points and structures (poles or towers) or other potential obstructions
- Clearly flag with brightly colored tape, all guy wires or other obstructions that could be damaged by the mowing equipment

The location and type of all potential obstructions or structures shall be communicated to the operator of the mowing equipment before any mechanical mowing is to be performed in any area.

Commencing January 1, 2008 the use of rear-mounted mowing units that requires the operator to physically turn to observe and manipulate the mowing unit will not be allowed on the Northeast Utilities system. All mowing units must be equipped with front mounted mowing heads or decks.

For Connecticut and Massachusetts projects, mowing shall be restricted to the dormant season only from September 1st to March 31st.

**D. Tree Trimming**

When required, trimming alongside the conductors shall be performed so that all branches to be removed are cut back to the edge of the right-of-way or main trunk depending on easement restrictions and property owner consent to trim beyond the right-of-way edge. All trimming shall be performed to allow for the following clearances between the vegetation and the conductors:

Voltage Class	Minimum Side Clearance	Minimum Under-Clearance
<230kV	20 feet	11 feet
230kV	30 feet	15 feet
345kV	30 feet	15 feet

All trimming shall be performed in accordance with proper arboricultural practices (i.e. ANSI A-300). Pruning alone cannot provide the minimum clearances listed – efforts shall be made to remove the offending trees or vegetation.

**E. Tree Removal**

Removal of trees within or along the right-of-way shall be performed in such a manner as to eliminate any potential for the felled tree to come within the minimum air-gap distances of the transmission lines. Minimum air gap distances (phase to ground) for the four transmission voltages on the NU system are as follows:

Voltage	Air Gap Distance
69kV	2.46 feet
115kV	2.46 feet
230kV	5.15 feet
345kV	9.45 feet

All trees that if felled would come close enough to the conductors than the minimum air-gap distances listed above shall be topped to remove that portion of the tree that could come within the minimum air gap distances unless the tree can be secured by ropes and felling directed to avoid coming closer than the minimum air gap distances in a safe manner.

In areas where there currently exists large numbers of incompatible tree species within the wire zones (i.e. cedars) removal will be performed on a staggered basis and the amount or number of trees to be removed will focus on those areas and tree where there exists the greatest potential risk of contact with the overhead facilities. Where possible and where reliability will not be compromised, the objective is to remove no more than 50% of the population of trees in any given year. The amount of trees to be removed may be greater in those areas where there exists a greater degree of non-compliant vegetation that constitutes a risk of contact with the energized facilities.

**J. Skilled Contractor Personnel**

The contractor shall employ supervisory and field personnel who are thoroughly trained in selective woody vegetation control techniques including all methods and materials to perform the work as specified. **The ability to recognize and identify desirable and undesirable species is mandatory for all vegetation control personnel.** All persons applying herbicides shall possess a valid applicator's license or supervisory certification for the state in which herbicides are being applied. All contract employees shall perform work in accordance with regulations listed under OSHA 29 CFR 1910.269. Trimming shall be performed by personnel certified to perform this work and in accordance with ANSI Z-133.1.1994. Trimming shall comply with standards listed under ANSI A-300.

*Contractors are required to certify that all personnel performing work in close proximity to transmission facilities are qualified to perform this work and ensure that all employees are trained and competent in the safe work practices around energized facilities.*

The contractor is required to know and understand all laws and regulations pertaining to the control of vegetation on right-of-ways, the use of herbicides and any restrictions to herbicide use for each state in which they are performing right-of-way vegetation control.

**VI. Property Owner Notification**

The contractor shall inform property owners and right-of-way abutters with homes or buildings located within 200 feet of the right-of-way or with maintained property to the edge of the right-of-way or within the right-of-way area, of the proposed work at least 7 days prior to the commencement of work. Personal contact or notification by a door hanger is required. The contractor shall also keep a listing of the contacts made and provide this list to the Owner's Representative at the completion of the project, or upon request by the Owner's Representative during the course of the project.

**The Notification person(s) shall be knowledgeable about all aspects of the work being performed including the timing of the work, the methods that will be employed and the materials that will be used on each particular property. Knowledge of the herbicides being used is required and the notification person(s) must be able to communicate the information specific to the materials to be used and to answer questions about environmental fate and toxicity of the products.**

*Notification may be made by personal visit, phone contact or use of a Company-approved door hanger. When door hangers are used, the Contractor will provide the contact name and a phone number for both the contractor and the Owner's Representative handling the project.*

**The Owner's Representative shall serve as the primary contact for any property owner questions regarding the work to be performed or any issues regarding compatible and non-compatible vegetation within the right-of-way. All notification material and methods shall include the name of the Owner's Representative to all property owners notified of impending work.**

**The contractor shall note the name of the person contacted when notification is made in-person or through a phone contact on the approved NU notification log. All notification logs must be presented to the Owner's Representative at the completion of the notification process on each project or upon request if the notifications are underway.**

The contractor shall use a toll-free number on all door hangers for property-owner inquiries.

**NOTE: For all touch-up applications, property owner notification must again be performed in the year the application is to be made in advance (at least 7 days) of the work.**

## VII. Environmental

All work performed under the rights-of-way brush control program will comply with all pertinent state statutes and federal regulations regarding herbicide use and applications. It is the Company's position that strict compliance with the principles of selective vegetation control and the identification and preservation of listed desirable species will be required. To be environmentally compliant, all crews shall be trained in the proper methods and use of herbicide application techniques being used. Low-volume and low pressure application methods are preferred. Proposals to employ high-volume/high pressure applications must be made at the time the bid proposal is submitted and will only be allowed after review and approval of the Owner's Representative.

All crew personnel shall be trained and knowledgeable in the proper actions for oil and pesticide spill containment and cleanup. All vehicles shall possess containment and cleanup equipment and materials at all times while performing this contract. All spills will be reported to the Owner's Representative in accordance with the procedure listed under Section VIII, E. Problems and Complaints (below) and all state and federal agencies shall be notified if any spill meets the requirements for reporting for these agencies.

**Contractor personnel must ensure that they follow all regulations as they relate to work within or travel through wetland areas. Adverse impacts to wetland areas shall be avoided at all times and crews shall only employ manual control methods within designated wetlands and wet areas. Mechanized vehicles shall not be used in wetland or wet areas and care shall be taken to avoid travel through wetlands if conditions at the time of maintenance result in rutting or soil damage in these areas. All damaged areas shall be repaired immediately and the NU Representative shall be notified of any inadvertent entry and damage to wetlands.**

Failure to adhere to the requirements of this section may result in contract suspension or cancellation.

## VIII. Company Oversight

All projects will be managed by an Owner's Representative who will have the responsibility to oversee the daily work and conformance to the contract requirements and maintenance specifications.

The Owner's Representative shall perform routine inspections of all crews during the performance of the work. These inspections will include weekly crew evaluations and specifically review work for compliance with all

contract requirements and specifications. Reviews will also focus on environmental issues and the performance of work in and around designated sensitive areas. Problems or deficiencies shall be addressed immediately with contractor crews, contractor supervision and Transmission Vegetation Management supervision. Problems will be documented and will require documentation by the contractor on problem resolution and corrective actions.

## **IX. Miscellaneous**

### **A. Changes to Contract Requirements**

In the event changes are requested in any portion of the contract such as delaying cutting to a period outside of the normal prep-cutting period or to request mowing in place of manual prep-cutting, the contractor must first request such modifications in writing to the Supervisor – Transmission Vegetation Management. All requests for modifications must be made well in advance of the need for the proposed modification. Any requested modifications must state a reason as to why the revision is necessary and is in the best interest of the contractor's and NU's needs. Modifications can only be implemented upon a written approval from the Supervisor – Transmission Vegetation Management.

### **B. Preparatory Cutting and Patrols**

In order to ensure that there are no potential tree/conductor problems during the course of the maintenance period and prior to the completion of all work, it shall be necessary for the contractor to perform a complete patrol of all areas to review and identify any potential tree problems. **Contractors shall use the form provided by NU for listing problem areas to be reviewed by the Owner's Representatives (Appendix 2).**

**The patrol and danger tree identification shall be completed before April 1<sup>st</sup> of each year. Also, all cutting - selective cutting areas, structure and access clearing and the cutting of vegetation in excess of 12 feet in height shall be performed and completed before June 1<sup>st</sup> of each year.**

### **C. Access for Rights-of-Ways**

The Company will provide information on the appropriate access points to rights-of-way where they exist. The Company will supply keys for all Company locked gates that will be returned to the Owner's Representative upon completion of the contract. The contractor shall be responsible for obtaining landowner permission to use any other access points not designated by the company. Access along rights-of-way shall not cause harm or damage to any private or company property or fixtures.

### **D. In-Lieu-Of Agreements**

At easement locations where the property owner has refused the use of herbicides or the removal of potentially interfering target species, the Owner's Representative will obtain an in-lieu-of agreement for the property owner to maintain the right-of-way area in a manner that is approved and accepted by the Company. If a property owner refuses to allow the performance of the work as specified, the contractor shall inform the Owner's Representative immediately for resolution.

### **D. Work Periods**

Work shall normally be performed during the company's normal work period - weekdays 7:30 am to 4:30 pm unless prior approval has been obtained from the Owner's Representative. There will be no work performed on weekends or company observed holidays unless prior approval is obtained from the Owner's Representative.

### **E. Problems and Complaints**

The contractor shall immediately inform the Owner's Representative of any problems or complaints received from property-owner's, abutters or town or state officials that develop during the course of the work.

The contractor shall also immediately notify the Owner's Representative of any incidents involving:

- Electric interruptions
- Electrical contacts by employees
- Employee accidents or injuries (non-electrical)
- Damage to NU equipment or property
- Damage to private property
- Herbicide or oil spills

Completion of the Contractor Incident Report Form (Appendix 5) is required on all recordable incidents listed above.

The Contractor is responsible for any repairs to Company or private property damaged during the course of the work.

In accordance with TD 916 Communications Following a Significant Safety Incident, the Owner's Representative shall document the incident in the contractor's work file.

#### **F. Weekly Reports**

Northeast Utilities Weekly Transmission Brush Control or Tree Work Report (form OP3368 - Appendix 3 shall be completed daily and submitted to the Owner's Representative weekly. The report shall be complete and provide all information relative to the project including the line or project numbers(s) all labor and equipment hours, amounts of herbicide mixtures and materials used, amount of area treated, location of areas treated (by structure number, road crossing or substation) and the number of trees removed or number of trees trimmed within the right-of-way or along the right-of-way edge. NOTE: only one form required per right-of-way project.

Contractor Supervision shall sign and date all completed time sheets and submit to the Owner's Representative by Tuesday of the week following the ending date on the time sheet. The Owner's Representative shall review and approve time sheet information and sign and date the time sheet verifying work is completed as required and all time sheet information is accurate.

#### **G. Pesticide Application Records**

Contractors are required to adhere to all state pesticide laws regarding the completion and retention of daily Pesticide application records for all herbicide applications. These records may be requested by NU if and when issues regarding applications are required.

#### **H. Project Summary Reports**

The contractor shall submit summary information on the Northeast Utilities System Rights-of-Way Herbicide Application Summary Report form (Appendix 4) for each project worked that year. This includes the general maintenance year as well as the touch-up performed in subsequent years.

Information required on this form includes the total acreage treated using the various application methods and materials as well as the total volumes of herbicide mixtures applied, the total amounts of each individual herbicide product applied (along with corresponding acreage) and the total amounts of basal oil diluents used. The summary report shall also list the total man hours, man-days and calendar days required to complete the project. A man-day is considered an 8-hour day.

**All Project Summary Reports are due before December 31<sup>st</sup> of the year in which the project was performed.**

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**APPENDIX 1**

**WOODY SPECIES ALLOWED TO REMAIN IN CONDUCTOR ZONE: (PARTIAL LIST)**

<u>COMMON NAME</u>	<u>GENUS/SPECIES</u>
Arrowwood	<i>Viburnum dentatum</i>
Bayberry	<i>Myrica pennsylvanica</i>
Blueberry - Highbush *	<i>Vaccinium corymbosum</i>
Blueberry - Lowbush	<i>Vaccinium angustifolium &amp; V. vacillans</i>
Brambles	<i>Rubus spp.</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Dogwood - Gray	<i>Cornus racemosa</i>
Dogwood - Redosier	<i>Cornus stolonifera</i>
Dogwood - Silky	<i>Cornus amomum</i>
Elderberry	<i>Sambucus spp.</i>
Hazelnut	<i>Corylus americana &amp; C. cornuta</i>
Honeysuckle - Bush	<i>Diervilla lonicera</i>
Honeysuckle - Fly	<i>Lonicera canadensis</i>
Honeysuckle - Tartarian	<i>Lonicera tatarica</i>
Huckleberry	<i>Gaylussacia spp.</i>
Maple-leaf Viburnum	<i>Viburnum acerifolium</i>
Meadowsweet - Broad-leaved	<i>Spiraea latifolia</i>
Meadowsweet - Narrow-leaved	<i>Spiraea alba</i>
Mountain Laurel *	<i>Kalmia spp.</i>
Oblong Fruited Juneberry	<i>Amelanchier bartramiana</i>
Oldfield Common Juniper	<i>Juniperus depressa</i>
Pasture Juniper	<i>Juniperis communis</i>
Running Shadbush	<i>Amelanchier stolonifera</i>
Sheeplaurel	<i>Kalamia augustifolia</i>
Spicebush	<i>Lindera benzoin</i>
Steeplebush	<i>Spiraea tomentosa</i>
Sweetfern	<i>Comptonia peregrina</i>
Sweetpepperbush	<i>Clethra alnifolia</i>
Winterberry	<i>Ilex verticillata</i>
Witch Hobble	<i>Vburnum alnifolium</i>
Witherod	<i>Viburnum cassinoides</i>

\* Normally will not be treated or removed regardless of height

**SPECIES ALLOWED TO REMAIN IN THE SIDE ZONES: (PARTIAL LIST)**

**All species listed above including:**

Alder	<i>Alnus spp.</i>
Hornbeam	<i>Carpinus betulus</i>
Dogwood - Alternate-leaved	<i>Cornus alternifolia</i>
Dogwood - Flowering	<i>Cornus florida</i>
Hornbeam	<i>Carpinus caroliniana</i>
Sumac - Shining	<i>Rhus copallina</i>
Sumac - Smooth	<i>Rhus glabra</i>
Sumac - Staghorn	<i>Rhus typhina</i>
Willows (except tree species)	<i>Salix spp.</i>
Witch-Hazel	<i>Hamamelis virginiana</i>







**APPENDIX 5**

**NORTHEAST UTILITIES  
TRANSMISSION LINE CLEARANCE  
INCIDENT REPORT**

District: \_\_\_\_\_ Date of Incident: \_\_\_\_\_  
Time of Incident: \_\_\_\_\_ Contractor: \_\_\_\_\_  
Foreman: \_\_\_\_\_ Person Involved in Incident: \_\_\_\_\_  
Town: \_\_\_\_\_  
Street: \_\_\_\_\_ Pole No.: \_\_\_\_\_

**Nature of Incident:**

- Electrical Contact
- Employee Injury (non electrical)
- Vehicle Accident
- Property Damage
- Electrical Interruption
- OIL Spill
- Pesticide Spill

Interruption No.: \_\_\_\_\_ Circuit: \_\_\_\_\_ Voltage: \_\_\_\_\_  
No. Customers Interrupted: \_\_\_\_\_ Contractor Charges: \_\_\_\_\_

**Incident Description:**

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**Follow Up Action Taken With Contractor:**

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Reviewed By: Arborist: \_\_\_\_\_ Date: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Date: \_\_\_\_\_