

**THE STATE OF NEW HAMPSHIRE
BEFORE THE
PUBLIC UTILITIES COMMISSION**

Unitil Energy Systems, Inc.

**RELIABILITY PROGRAM
AND
VEGETATION MANAGEMENT PROGRAM
ANNUAL REPORT – FISCAL YEAR 2017**

1. Introduction

Pursuant to the Settlement Agreement approved by the New Hampshire Public Utilities Commission (“Commission”) in Docket No. DE 10-055¹, Unitil Energy Systems, Inc. (“UES” or “Company”) is submitting the results of the Reliability Enhancement Plan (“REP”) and Vegetation Management Plan (“VMP”) for Fiscal Year 2016 (“FY 2016”), report the period, January 1, 2016 – December 31, 2016.

The Settlement Agreement provides that on or before the last day of February of each year following approval, Unitil will provide an annual report to the Commission, Staff and OCA showing actual REP and VMP activities and costs for the previous calendar year, and its planned activities and costs for the current calendar year. Actual and planned REP and VMP costs shown in the report will be reconciled along with the revenue requirements associated with the actual and planned capital additions and expenses. This report includes the following information:

- (A) A description of Unitil’s VMP;
- (B) A comparison of FY2016 actual to budgeted spending on O&M activities related to the VMP
- (C) Detail on the O&M spending related to the FY2017 VMP estimated expenditures and work to be completed;
- (D) A summary of the reliability performance tracking for pruning, hazard tree and storm pilot program components;
- (E) A summary of the Vegetation Management Storm Hardening Pilot Program results;
- (F) Detail on the O&M spending related to Exacter Inspection survey;
- (G) Detail on the O&M spending related to Enhanced Tree Trimming;
- (H) Detail on the reliability capital spending for 2016 and 2017 budget; and
- (I) Reliability performance of the UES Capital and UES Seacoast systems.

¹ Order 25,214 dated April 26, 2011

2. Vegetation Management Plan

The VMP is based upon the recommended program provided in the report of Unitil's consultant Environmental Consultants, Inc. ("ECI")², modified to incorporate a 5-year prune cycle with 10-foot side and 15-foot top prune zones.

2.1. Plan Description

Unitil's VMP is comprised of five components; 1) circuit pruning; 2) hazard tree mitigation; 3) mid-cycle review; 4) forestry reliability assessment; and 5) storm resiliency work. This program is designed to support favorable reliability performance, reduce damage to lines and equipment, as well as provide a measure of public safety. The main benefits and risks addressed by these programs are reliability, regulatory, efficiency, safety and customer satisfaction.

2.1.1. Circuit Pruning

Vegetation maintenance pruning is done on a cyclical schedule by circuit. The optimal cycle length was calculated by balancing five important aspects: 1) clearance to be created at time of pruning; 2) growth rates of predominant species; 3) risk to system performance; 4) aesthetics / public acceptance of pruning; and 5) cost to implement. For New Hampshire, this optimal cycle length was calculated as 5 years for all lines.

2.1.2. Hazard Tree Mitigation

The Hazard Tree Mitigation program ("HTM") consolidates tree removal activities into a formalized program with risk tree assessment. This program is aimed at developing a more resistant electrical system that is more resilient under the impacts of typical wind, rain and snow events. The intention is to accomplish this through minimizing the incidence and resulting damage of large tree and limb failures from above and alongside the conductors through removal of biologically unhealthy or structurally unstable trees and limbs.

²A copy of the ECI reliability report, originally provided in response to data request Staff 1-29 (Confidential), was made part of the record in DE 10-055, UES's 2010 base rate case, as a Confidential Exhibit, accompanied by a public redacted version, during the hearing before the Commission.

HTM circuits are identified and prioritized through reliability assessment risk ranking, identification as a worst performing circuit, field problem identification, and time since last worked. Once circuits are identified they are scheduled in two ways: 1) while the circuit is undergoing cycle pruning; or 2) scheduled independently of cycle pruning. In New Hampshire, HTM circuit selection corresponds closely with cycle pruning, as both pruning and HTM are on a 5 year cycle.

In order to produce the greatest reliability impact quickly and cost effectively, HTM circuit hazard tree assessment and removal is focused primarily on the three phase only, with most emphasis on the portion of the circuit from the substation to the first protection device. In circuits that have undergone storm resiliency work, the HTM focus also includes single phase circuitry.

2.1.3. Mid-Cycle Review

The mid-cycle review program targets circuits for inspection and pruning based on time since last circuit pruning and forecasted next circuit pruning. The aim of this program is to address the fastest growing tree species that will grow into the conductors prior to the next cyclic pruning, potentially causing reliability, restoration and safety issues. As the first full circuit pruning cycle is underway, mid-cycle review will be used to address only 13.8kV and above, three-phase portions of selected circuits. Circuit selection is based on number of years since last prune and field assessment.

2.1.4. Forestry Reliability Assessment

The Forestry Reliability Assessment program targets circuits for inspection, pruning, and hazard tree removal based on recent historic reliability performance. The goal of this program is to allow reactive flexibility to address immediate reliability issues not addressed by the scheduled maintenance programs. Using recent historic interruption data, poor performing circuits are selected for analysis of tree related interruptions. Circuits or portions of circuits showing a high number of tree related events per mile, customers interrupted per event, and/or customer minutes interrupted per event are selected for field assessment. After field assessment, suitable circuits are scheduled and a forestry work prescription is written for selected circuits or areas.

2.1.5. Storm Resiliency Work

The SRP targets critical sections of circuits for tree exposure reduction by removing all overhanging vegetation or pruning “ground to sky”, as well as performing intensive hazard tree review and removal along these critical sections and the remaining three phase of the circuit. The goal of this program is to reduce tree related incidents and resulting customers interrupted along these portions in minor and major weather events. In turn, the aim is to reduce the overall cost of storm preparation and response, and improve restoration.

2.2. 2017 Actual Expenditures and Work Completed

Table 1 depicts the 2017 VMP expenditures by activity in relation to the anticipated budget expenditures. As the program progressed in 2017 there were some deviations in the anticipated expenditures. In the VMP spending, the Hazard Tree Mitigation and the Police/Flagging work activities had the most deviation in spending relative to anticipated costs. Both were less than anticipated. An additional cost for VMP Planning was also incurred for a new viewer to current software which more efficiently and effectively schedules, manages, implements and monitors the VMP components and the SRP work. As shown in the table below, the program total was \$606,560 under budget, with only minor work carryover (in hazard tree, mid-cycle and sub-transmission) into 2018 due to vendor delays from nationwide and regional storm impact. The work spending for the SRP was well above the anticipated level. This was due to encountering a higher than anticipated level of risk trees on the identified circuits. As shown in the table below, total spending for all VMP and SRP components was above the budget by \$210,887.