Eric Fryson

From: Pat Pottle [ppottle@ausley.com]
Sent: Tuesday, February 07, 2012 10:27 AM
To: Filings@psc.state.fl.us
Cc: Paula Brown; Howard Bryant; T. J. Szelistowski; Billy Stiles; Jeff Wahlen
Subject: TECO Petition to Modify Vegetation Plan
Attachments: Vegetation Petition.pdf

Electronic filing

a. Person responsible for this electronic filing:

James D. Beasley
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b. Docket No. 120038-EI; In re: Tampa Electric Company's Petition to Modify Vegetation Management Plan

c. The document is being filed on behalf of Tampa Electric Company

d. There is a total of 25 pages, plus cover letter

e. The document attached for electronic filing is a cover letter and Tampa Electric Company's Petition to Modify Vegetation Management Plan.

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February 7, 2012

VIA: ELECTRONIC FILING

Ms. Ann Cole, Director
Division of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Tampa Electric Company's Petition to Modify Vegetation Management Plan

Dear Ms. Cole:

Enclosed for filing in the above-styled matter is Tampa Electric Company's Petition to Modify Vegetation Management Plan.

Thank you for your assistance in connection with this matter.

Sincerely,

James D. Beasley

JDB/pp
Enclosure

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Tampa Electric Company's Petition to Modify Vegetation Management Plan.	))))	DOCKET NO. 120038-EI FILED: February 7, 2012

TAMPA ELECTRIC COMPANY'S PETITION TO MODIFY VEGETATION MANAGEMENT PLAN

Tampa Electric Company ("Tampa Electric" or "the company") hereby petitions the Commission to approve modifications to the company's Vegetation Management Plan and, as grounds therefor, says:

1. Tampa Electric is a Commission regulated investor-owned electric utility serving customers in Hillsborough and portions of Polk, Pinellas and Pasco Counties in Florida. The company's principal offices are located at 702 N. Franklin Street, Tampa, Florida 33601.

2. The names and addresses of Tampa Electric's representatives to receive communications regarding this docket are:

James D. Beasley
J. Jeffry Wahlen
Ausley & McMullen
Post Office Box 391
Tallahassee, FL 32302
(850) 224-9115
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Paula K. Brown, Administrator
Regulatory Affairs
Tampa Electric Company
Post Office Box 111
Tampa, FL 33601
(813) 228-1444
(813) 228-1770 (Fax)

3. In the aftermath of the destructive hurricane seasons of 2004 and 2005 the Commission conducted workshops and ultimately required investor-owned electric utilities in Florida to file plans and estimated implementation costs for ongoing storm preparedness for ten initiatives designed to strengthen or "harden" the state's utility infrastructure to better withstand

future storms. One of the ten initiatives was the implementation of a three year vegetation management cycle for distribution circuits.

4. In the order requiring implementation of the ten hardening initiatives, Order No. PSC-06-0351-PAA-EI, issued April 25, 2006 in Docket No. 060198-EI, the Commission required investor-owned utilities to provide a plan and estimated costs for a complete three year trim cycle for all distribution circuits. In that order the Commission stated that any additional alternatives proposed by the utility shall be compared to a three year trim cycle and must be shown to be equivalent or better in terms of costs and reliability for purposes of preparing for future storms.

5. As subsequently reflected in Order No. PSC-06-0781-PAA-EI, issued September 19, 2006 in Docket No. 060198-EI, Tampa Electric thereafter set about to implement the three year trim cycle. As the Commission found in that order, Tampa Electric's plan would comply with the three year trim cycle when fully implemented. The Commission also noted in that order that the investor-owned electric utilities plans for implementing the ten initiatives required by the Commission were "living documents" and subject to constant revision as new lessons are learned. (Order at p. 20).

6. As part of its ongoing efforts to monitor and evaluate the appropriateness of its vegetation management practices, Tampa Electric recently retained the services of Davies Consulting, Inc. to evaluate the costs and benefits of a three year versus four year trim cycle for the company's distribution circuits. The results of that study are reflected in a January 6, 2012 Davies Tree Trimming Cycle Analysis report, a copy of which is attached hereto as Exhibit "A". As reflected in the report, the consultant concluded that a four year trim cycle would cost approximately $12.9 million less than the three year trim cycle over a ten year period. The

consultant further concluded that there would be only a very minor impact on the company's System Average Interruption Duration Index ("SAIDI") of approximately 2.67 minutes per year.

7. Investor-owned utilities are encouraged to reduce the cost of providing electric service to their customers to the extent they are able to do so while insuring that the services they provide are safe and reliable. In prescribing hardening activities the Commission has adopted a flexible approach to allow for proposed changes depending upon the experience and "lessons learned" the utilities are able to develop over time.

8. Tampa Electric believes its proposed shift to a four year trim cycle for vegetation management will reduce the cost of this service while enabling the company to continue providing safe and reliable electric service to its customers.

WHEREFORE, Tampa Electric requests that the Commission approve the company's proposed modification of its vegetation management plan to provide for a four year trim cycle.

DATED this 7th day of February, 2012.

Respectfully submitted,

JAMES D. BEASLEY
J. JEFFRY WAHLEN
Ausley & McMullen
Post Office Box 391
Tallahassee, Florida 32302
(850) 224-9115

ATTORNEYS FOR TAMPA ELECTRIC COMPANY

STRATEGIES FOR COMPLEX ORGANIZATIONS

Tampa Electric
Tree Trimming Cycle Analysis
January 06, 2012

Prepared For:

TECO
TAMPA ELECTRIC

Prepared By:

davies consulting inc.

Exhibit "A"

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Executive Summary

In 2007, Tampa Electricutilized Davies Consulting (DCI) to conduct a structured approach in the evaluation of alternative vegetation management (VM) programs with the objective of ultimately developing a VMstrategy that would enable the company to meet its reliability performance targets, financial requirements, as well as the commitments made to the Florida Public Service Commission (PSC). In 2011, Tampa Electric retained DCI to update the study in order to re-assess different VM strategies and determine whether the company's existing VM program continues to meet current performance objectives and PSC requirements. Specifically, the objective of the study was to compare costs and benefits of a three-year cycle to a four-year cycle.

To meet the objective, Tampa Electric retained the services of DCI to implement its Tree Trimming Model (TTM™), a data-driven tool for optimizing VM activities from a cost-reliabilitystandpoint. The project involved intensive data gathering and processing. Data collection focused on three primary sources:the Geographic Information System (GIS)for circuit data such as overhead length, voltage, and substation; the Distribution Outage Database (DOD) for outage data from January 2002 to June 2011; and historical trimming and cost data. The trim history was reconciled with Tampa Electricpersonnel's knowledge of the system in order to establish average trimming costs for year 2010.Using the information gathered and knowledge of the system, all Tampa Electric circuits were grouped into performance and cost curves.

The analysis described in this report focused on evaluating two scenarios. The first scenario is based on the current Tampa Electric VM program and includes trimming approximately one-third of overhead miles a year in each service area, equal to a three-year trimming cycle. The alternative scenario represents a four-year cycle that is based on trimming approximately one-quarter of overhead miles a year in each service area. In addition to evaluating the costs of each scenario and resulting reliability performance, TTM was also used to assess the overall system costs (including normal, storm restoration, and corrective maintenance costs)associated with the two scenarios.

When compared, the four-year trim cycle costs approximately $12.9 million less than the three-year trim cycle over a ten-year period and results in a predicted average tree-related SAIDI of 23.62 minutes per year. The estimated average tree-related SAIDI associated with the three-year trim cycle is approximately 2.67 minutes lower. The net present value(NPV) of the total VM program cost (including normal, storm restoration, and corrective maintenance costs) associated with the four-year cycle is $3.1 million less than theNPV of the total VM program costs associated with the three-year cycle.

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1. Introduction

Tampa Electric requested DCI to conduct a structured approach in the evaluationof alternative VMprograms.The ultimate objective was to develop a VM strategy that would meet the company'sreliability objectives, financial requirements, and commitments made to the PSC.

DCI utilized its TTM, a data-driven tool for optimizing spending on trim activities for reliability. The initial implementation of the TTM was carried out in 2007and involved two phases.The first, referred to here as the "core TTM analysis,"was geared toward an evaluation of the impact of tree-trimming spendingon day-to-day reliability performance.The second phase, referred to as the "storm scenario analysis" explored the storm restoration cost implications of the different strategies.

Since this initial implementation, Tampa Electric staff has maintained the model and used the analysis in order to support its prioritization of circuits for its VM program each year. In addition, with support from DCI, every two years since the initial implementation, Tampa Electricundertook a broader effort to update the assumptions and analysis based on the most recent outage and trim data. This report summarizes the results of the most recent TTM update which was completed in late 2011.

Tampa Electric currently trims the entire circuit starting from the breaker as a part of itsVM program. In the initial implementation of the TTM, the companyevaluated the costs and benefits associated with trimming backbone and lateral sections of the circuits on a different cycle. However, in the latest analysis, and after careful consideration, it was decided that splitting circuits into backbone and lateral sections for VMwas not practical nor did it align with the company's operating philosophy. Some specific challenges with backbone/lateral split include:

- Most of the lateral sections of the circuits are not currently fused, minimizing the reliability benefit of trimming backbone sections on a more frequent cycle;
- Historical data was not tracked separately for backbone and laterals in order to make sound assumptions related to costs and reliability benefits for the different sections; and,
- Demarcation of lateral vs. backbone sections in the field and on maps is not clearly established, which would make it difficult to implement the program in the field.

The purpose of this report is to serve as a reference for the data collection and processing involved in conducting a TTM evaluation, summarize the results from the latest analysis that was performed, and provide sound judgment from the results of the analysis.

This report is divided into the following sections:

- Section 2 describes the sources of data and some basic statistics derived from them;
- Section 3 discusses how the data was processed and how the key assumptions were made in order to generate cost and performance curves;
- Section 4 describes the core TTM scenario analysis, focusing on the impact of the two trimming programs on spending and day-to-day reliability;and,
- Section 5 describes the storm scenario analysis, where the impact of tree trimming strategies on the budget and reliability is supplemented by an analysis of storm restoration costs.

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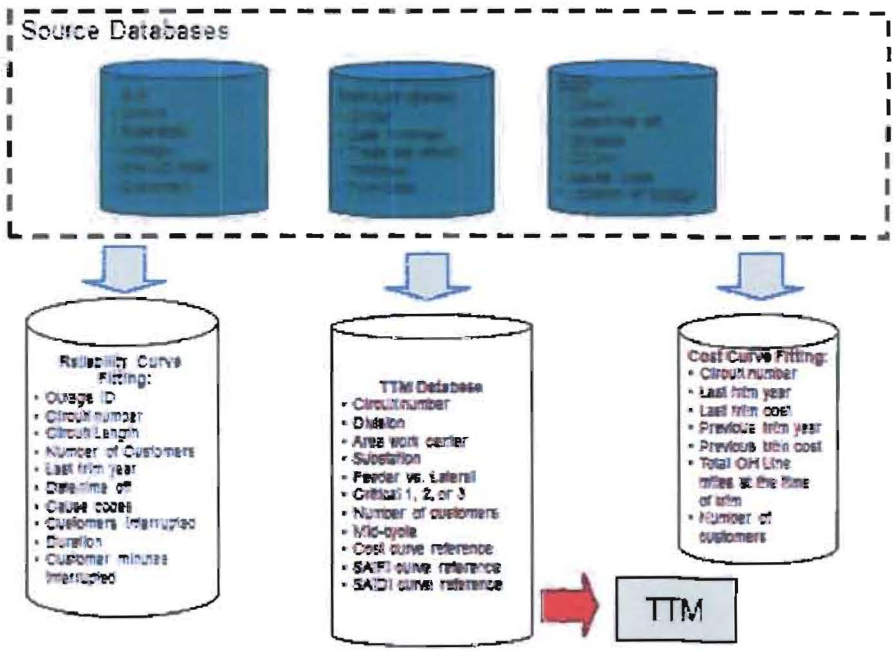
2. Data Sources and Characteristics

The TTM analysis typically requires three principal data sources:

- A complete inventory of the overhead circuits in the system, includingcircuit characteristics such as customer count, overhead mileage, and geographic coordinates;
- The outage database or databases; and,
- A history of trimming activity, preferably including start and end dates, costs, and covering multiple trims for each circuit.

Figure 1 - TTM Data Sources and Data



Flow

2.1. Circuit List

2.1.1. Data Sources

A comprehensive list of circuits was obtained from Tampa Electric's GIS, which contained a total of 754 circuits.

Not all circuits and mileage were of interest, as TTM is only relevant to the overhead portion of circuits for which trimming is a regular concern. Ultimately, 701"trimmable" circuits were included in the analysis, representing some 6,330 miles of overhead circuit length.

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Circuits were also assigned geographic point designations by taking the average latitude and longitude of all transformers on each circuit, which was also extracted from theGIS. This would later enable plotting of circuits on an area map for easier visualization of the recommended trimming cycles.

2.2. Performance Data

2.2.1. Data Sources

Circuit reliability performance data was gathered from Tampa Electric'sDOD. The analysis included outages from January 1, 2002throughJune 30, 2011, thus accommodating at least nine full calendar years. Of particular interest were outages with the tree-related causecodes found in Table 1 below. The table indicates the number of events associated with each cause code, as well as the total customer interruptions (CI) and customer minutes of interruption (CMI).

Table 1: Tree-Related Cause Codes (January 1, 2002 – June 30, 2011)

Cause Code	Events	CI	CMI
Non Preventable	1,964	164,718	17,091,713
Other Weather	281	28,219	8,493,216
Preventable	2,244	144,630	14,462,951
Tree\Blew into Line	810	59,365	17,487,512
Tree\Fell into Line(Non Prev.)	3,879	411,706	32,519,616
Tree\Fell into Line(Prev.)	3,039	277,067	22,766,690
Tree\Grew into Line	4,362	204,751	16,452,870
Tree\Vines	2,723	23,812	2,386,402
Trees (Other)	310	11,864	1,262,496
Vines	1,062	9,513	1,038,094
Wind	175	58,908	24,005,988
Incorporated Unknown	4,250	147,211	8,828,646
Incorporated Weather	1,702	204,466	50,262,670
Grand Total	26,801	1,746,230	217,058,864

Tampa Electricalso incorporated a portion of CIs and CMIs from outages with "Unknown" and "Weather" cause codes. From experience, DCI has found with other utilitiesthat a significant portion of such catch-all causes is,in fact,tree-related. Therefore, after conducting an internal analysis of trends in outage counts for these cause codes in relation to explicit tree causecodes, Tampa Electric determined that 25 percent was a reasonable proportion to include in the analysis.

Finally, certain outages were excluded from this analysis irrespective of the cause code. These included those adjustments specified and allowed in accordance with Rule 25-6.0455, Florida Administrative Code.

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2.3. Trim Data

2.3.1. Data Sources

Tampa Electric records and maintains trim history that includes the following types of data:

- Circuit number;
- Trim completion date; and,
- Cost to trim the entire circuit.

The trim data was paired down to the outage data with the circuit number being the link between the two data sources. For analysis purpose the circuit number and trim completion date (year and month of trim) of each circuit trim were incorporated in the analysis.

Many circuits had no completion date but were "in progress" meaning they werebeing trimmed. Although some outages may have occurred after the start of the trim, the previous trim completion date was used in the analysis of that particular circuit.

2.3.2. Trim Cost Estimates

Tampa Electric provided DCI with 2010trim cost estimates in order to validate or update cost curves for each of the service areas. This resulted in minor adjustments to the curves which will be discussed in Subsection3.2.

2.3.3. Last Trim Dates

An important data element included in TTM is the last trim date of each circuit. This allows the model to determine the current state of the circuit and the resulting reliability deterioration and trim cost escalation. All circuits had an identified last trim date. Also, 13 new circuits were installed after 2009; therefore, the assumption was made to use each new circuit's installation date as its last trim date.

3. Data Processing and Grouping

The TTM analysis process requires both performance-based curves and cost-based curves be developed based on the available data. This section describes the process DCI applied at Tampa Electric to accomplish this task.

3.1. Reliability Performance Curve Development

3.1.1. Generating Data Points

Performance data points were derived using historical outage data, trim data, and circuit length data. Every outage was expressed as a number of CI or CMI per circuit mile, and was plotted relative to the most recent time it was trimmed. Values

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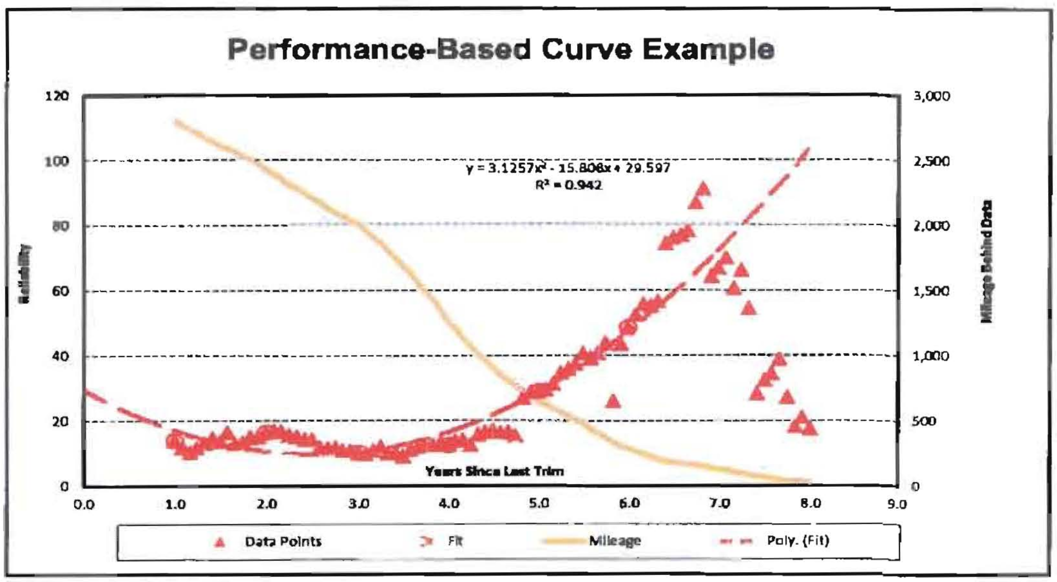
for 12 consecutive individual months were rolled up to create year-based values, and these were plotted in MS Excel so that a curve could be fit to them.

A number of conditions had to be satisfied in order to ensure that the data points were correct:

- Outage data was omitted in the months when a circuit was being trimmed.
- Outages were associated only to the most recent trim.
- Figure 2below reflects the mileage into which the 12-month roll-up of CI or CMI is divided and represents the total mileage of the system or group of circuits. This ensures that in a situation where several circuits do not have any outages in a particular 12-month roll-up, those circuits were not disregarded, but rather served to appropriately pull the curve downward as part of the averaging process. This provided assurance that the resulting curves were representative of the overall CI or CMI per mile of circuits in the group and not just the CI or CMI per mile on circuitsthat happened to have outages.

Figure 2 - Sample Performance Curve



3.1.2. Choice of performance parameter

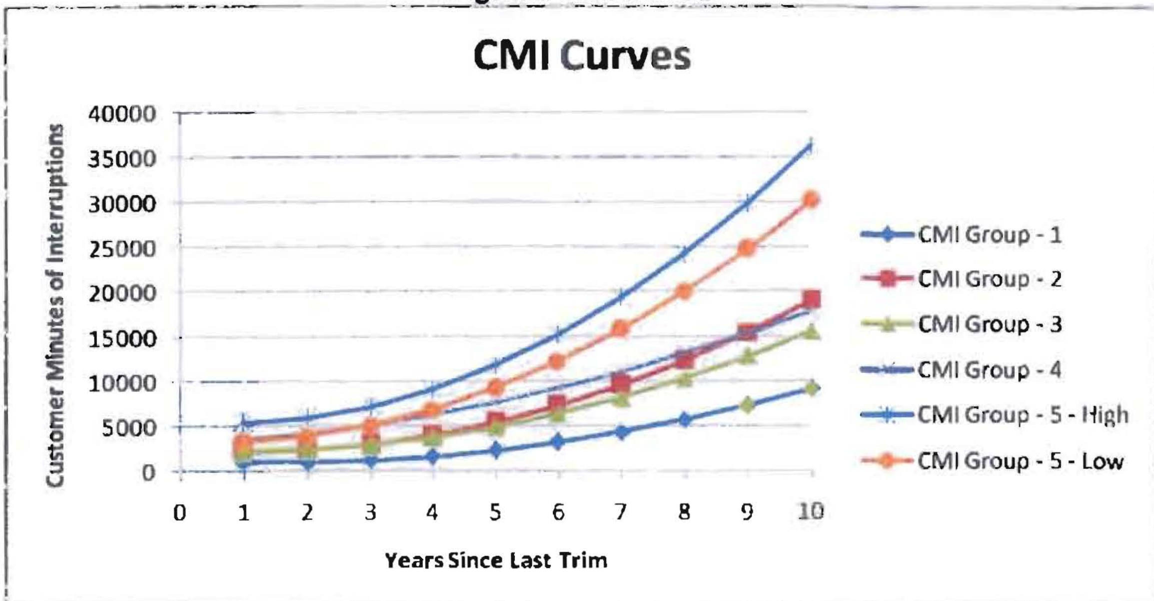
SAIDI hasbeen the reliability measure of greatest interest to Tampa Electric, and as a result, significantattention was dedicated to developing CMI curves. Eventually, scenarios were run with SAIDI as the optimized parameter. However, CI curves were also developed as they were necessary in the TTM storm analysis module.

3.1.3. Creating CircuitPerformance Groups

Circuits were grouped according to historical performance, initially by deciles(tenths) of total tree-related CMI per mile (including approximately 25 percent of Unknown and Weather CMI) from 2002 to 2006.The same circuit grouping was kept in subsequent updates to the TTM assumptions since the CMI/mile characteristics of the circuits did not vary significantly to allow for big circuit movement across groups. The new circuits installed after 2009 were assigned to the appropriate group based on their CMI/mile values if they witnessed outage events or to the CI and CMI Group 1 if they did not encounter any outage events thus far.

A curve similar to that shown in Figure 2 was developed for each of the CMI groups, resulting in a total ofsix curves, which are shown in Figure 3 below.These curves provided the critical input required to compute the projected reliability associated with trimming each circuit. Eventually, the computed reliability values were used as the denominator to determine the cost-effectiveness score for circuits, which then served as the basis for their prioritization.

Figure 3- CMI Curves



When viewed geographically, it should be observed that each of the company's seven service areas has a mixture of circuits belonging to different CMI groups. This was important to ensure that the trim optimization would not be geographically biased, but rather that trim resources would be equitably distributed across service areas according to potential reliability gains.

Although optimization was driven by the CMI curves, it was also necessary to develop CI curves in order for the model to generate CI estimates for each scenario.

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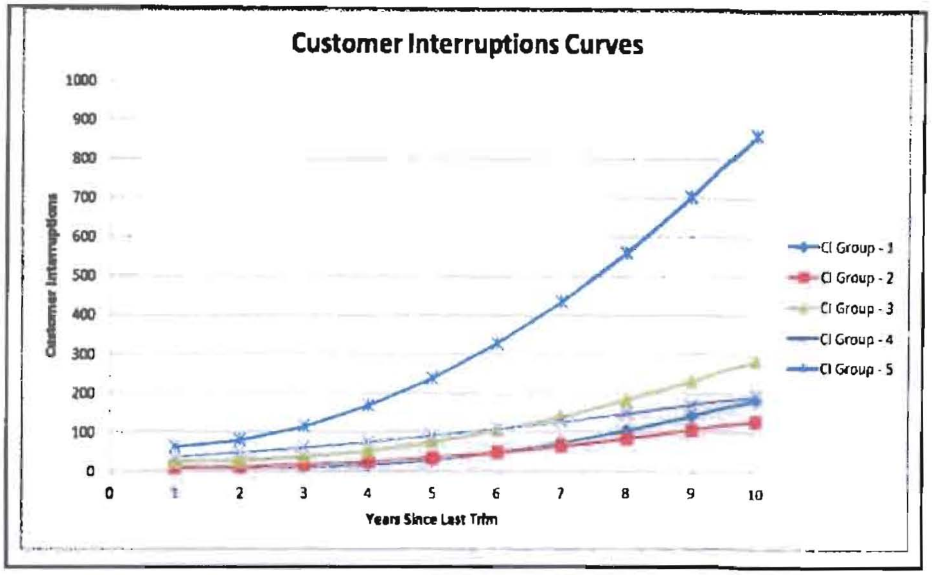
As will be discussed in Subsection 5.1.2, annual non-storm restoration costs were driven by CI rather than CMI. The CI circuit grouping was slightly different from the CMI groups. The resulting CI curves are shown in Figure 4.

Figure 4- CI Curves



3.2. CostCurve Development

Cost curves were the second factor in calculating the cost/benefit score of each circuit in TTM.

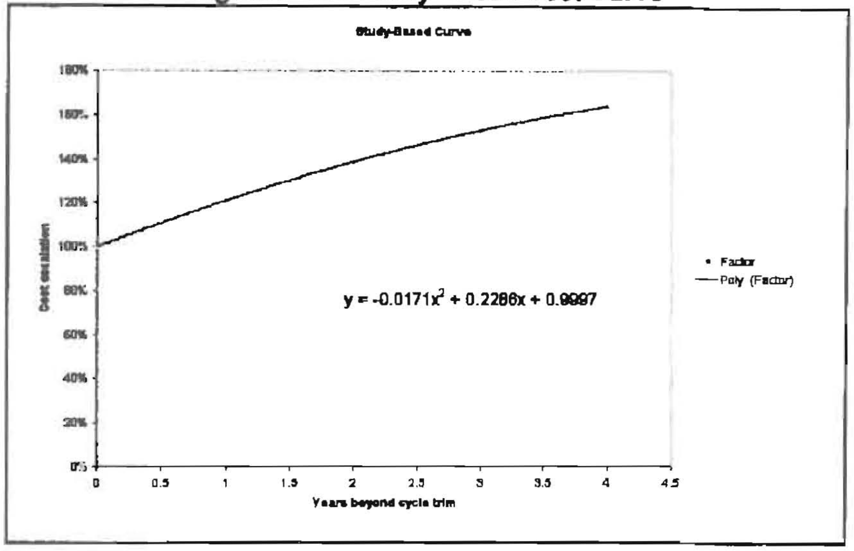
The shape of the cost curves were based on the Economic Impacts of Deferring Electric Utility Tree Maintenance study by ECI[1] that quantified the percentage increase in the eventual cost of trimming a circuit for each year that it is left untrimmed beyond the recommended clearance cycle. The findings of the ECI study are summarized in Figure 5 below. For instance, if the clearance cycle is three years, then waiting four years between trims will increase the cost per mile by 20percent. Delaying trimming by another year will further inflate costs to 40 percent of the base cost and further increase it for subsequent years.

The ECI study only considered annual trimming cost increases between the recommended clearance cycle andup to a four-year delay. In generating a comprehensive cost curve that goes from one year since last trim onward, DCI supplemented the percentages from the ECI study with two assumptions:

[1] Browning, D. Mark, 2003, Deferred Tree Maintenance, Environmental Consultants Incorporated (ECI)

- Cost reduction from annual trimming – the percentage reduction from the clearance trim that will be achieved if the circuit was trimmed every year; and,
- Escalation –annual percentage increase in cost to be applied from the fourth year after the clearance cycle onward.

Figure 5- ECI Study-Based Cost Curve



The following section describes how such a cost curve methodology was applied to each of Tampa Electric's seven service areas.

3.2.1. Applying ECI study parameters and 2010 cost

Tampa Electric's cost-per-mile estimates were derived using 2010 data. However,the trim age of circuits trimmed in 2010varied by service area. That meant there would be a biased comparison of service areas when considering 2010 costs alone. Therefore, the need arose to determine the equivalency point on the ECI cost curve for the 2010 costs. This was done for each service area with the assistance of empirical knowledge from field personnel and ultimately provided DCI with the relative estimate of the actual cost experienced against the target trimming cycle. As a part of the 2011 revision of the cost curves, the existing curves were compared to the average costs per mile and cycles recorded in 2010 across each service area and adjusted accordingly.

The adjusted cost curves for each service area are shown inFigure 6 below.

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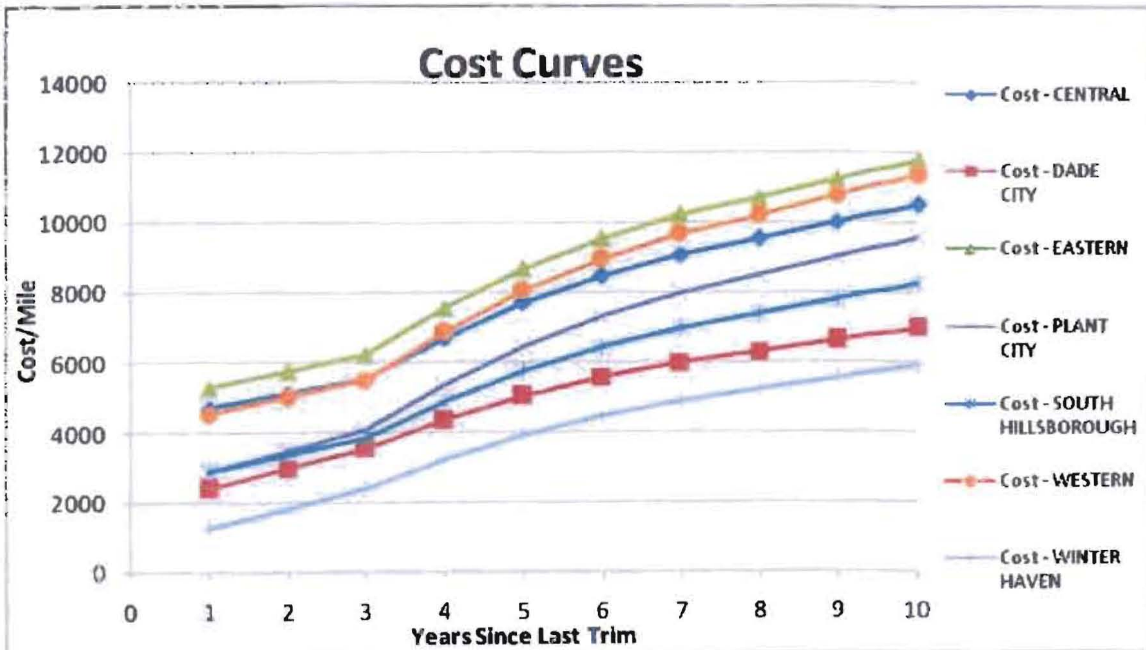
Figure 6 - Cost Curves



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4. TTM Core Scenario Analysis

TTM core analysis deals with the impact of tree trimming programsembodied by the trim cycle andbudget levels on the reliability of the system.

4.1. Analysis Scenarios

DCI analyzed twoVM scenarios that were focused on trimming the entire circuits. The scenarioswere mileage based and included: (1) a three-year cyclemileage-partitioned optimization;and, (2) a four-year cyclemileage-partitioned optimization.

4.1.1. Scenario 1 – Three-Year Cycle Mileage-Partitioned Optimization

This scenario was based on trimming one-third of each service area's mileage every year, or approximately 2,110 miles in total. This mileage optimization was partitioned-based, which means that individual mileage targets were assigned for each service area according toTable 2 below.

Table 2:Mileage Allocation for Each Service Area

Service Area	Mileage Target
Central	351
Dade City	123
Eastern	282
Plant City	416
South Hillsborough	251
Western	376
Winter Haven	311
Total	***2,110***

4.1.2. Scenario 2 – Four-Year Cycle Mileage-Partitioned Optimization

Thisscenario was based on trimming one-fourth of each service area's mileage every year, or approximately 1,582 miles in total. Similar to the three-year cycle, the mileage target was partition-based with specific mileage targets for each service area and is provided in Table 3 below.

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Table 3: Mileage Allocation for EachService Area

Service Area	Mileage Target
Central	263
Dade City	93
Eastern	211
Plant City	312
South Hillsborough	188
Western	282
Winter Haven	233
Total	***1,582***

Thetwo scenarios were not constrained by a budget, meaning TTM identified a combination of circuits to trim which would provide the greatest reliability value at the lowest overall cost.

4.2. Analysis and Findings

The two scenarios were evaluated based on the trimming costs and expected reliability performance. The trimming costs were compared in terms of theNPVof the projected cash flows over a 10-year evaluation period. Reliability performance, expressed in terms of SAIDI minutes, was calculated for each year over the period.

As can be seen in Table 4 below, when compared, the four-year trim cycle costs approximately $12.9 million in NPV less than the three-year trim cycle over the 10-year period and results in a predicted average tree-related SAIDI of 23.62 minutes per year.The estimated average tree-related SAIDI associated with the three-year trim cycle is approximately 2.67 minutes lower.In other words, and as presented in Table 5 below, for the incremental investment of $12.9 million NPV over a 10-year period, Tampa Electric can avoid approximately 26.7 minutes of SAIDI in that 10-year period for the average cost of $484,000 per SAIDI minute avoided.

Table 4:Scenario NPVAnalysis

	10-year VM Trim Budget NPV Value (in millions)	**10-Yr Total (Average) Tree SAIDI Minutes** (2012-2021)	**10-Yr Average Tree SAIDI Minutes (2012-2021)**	**Incremental 10-Yr VM Trim Cost per Tree SAIDI Minute Avoided (in millions)**
Three-year cycle	$ 81.64	209.49	20.95	$ 0.484
Four-year cycle	$ 68.70	236.23	23.62	N/A
Difference	$ 12.93	-26.74	-2.67	N/A
Change %	16%	-13%	-13%	N/A

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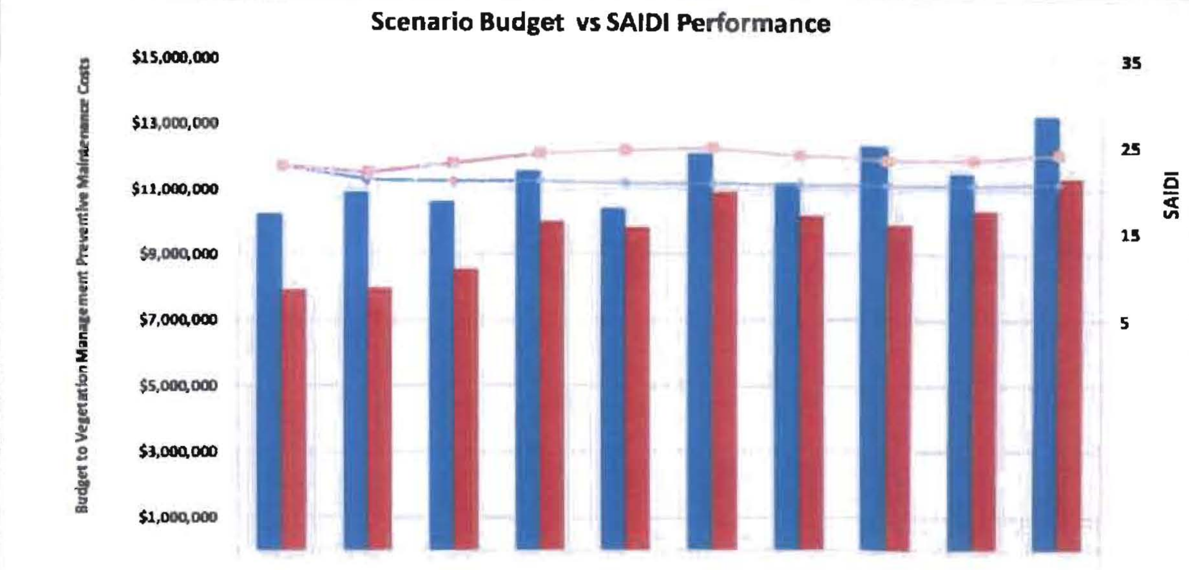
The graphin Figure 7below provides the detail on how the above described scenarios fared against each other in terms of trimming cost and projected SAIDIeach year from 2012 through 2021.

Figure 7 - Comparative Scenario Analysis



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1 - TECO 3 yr avg partitioned	$10,236,869	$10,910,516	$10,615,036	$11,583,564	$10,427,068	$12,126,631	$11,203,968	$12,351,944	$11,524,876	$13,292,529
2 - TECO 4 yr avg partitioned	$7,927,002	$7,972,141	$8,545,322	$10,005,958	$9,835,268	$10,934,681	$10,204,174	$9,923,788	$10,356,111	$11,374,998
1 - TECO 3 yr avg partitioned	22.71	21.09	20.95	20.98	20.74	20.71	20.53	20.55	20.53	20.72
2 - TECO 4 yr avg partitioned	22.71	21.96	23.02	24.19	24.56	24.78	23.95	23.48	23.43	24.18

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5. TTM Storm Scenario Analysis

5.1. TTM Storm Analysis Module Data and Assumptions

Since VM affects the amount of damage during major events, the TTM includes a module that allows for an analysis of potential storm impacts for each scenario. This is done by comparing scenarios on a wider range of cost classifications that include the following:

- Trim Budget – the cost of preventive trimming over the planning period which corresponds to the budget figures presented in Subsection4.2;
- Corrective Maintenance Cost – the cost of reactive trim activity such as hot-spotting associated with each scenario;
- Normal Restoration Cost – the cost of restoring customers that experienced outages on a normal day as a result of the scenario parameters; and,
- Storm Restoration Cost – the cost of restoring customers during storm outages.

The first two cost classifications are sometimes referred to as "hard" costs since they are derived from day-to-day operations and thus there is high probability that they will indeed be incurred. The last two costs – normal and storm restoration – are sometimes referred to as "soft" costs as they will only be incurred during outages. These "soft" cost projections will be based on expected values and provideless assurance they will match the actual costs that occur in any single year. In the long run, however, when such actual costs are averaged out over a sufficient number of years, they are expected to approach the projected value.

5.1.1. Corrective Maintenance Costs

Corrective maintenance is assumed on a per scenario basis. Tampa Electric provided estimates for the current corrective maintenance spending at $546,523 for the three-year cycle program, as well as percentage change from this value for the four-year cycle scenario. As can be seen inTable 5below, the corrective maintenance cost was kept constant for both scenarios for the first year, and adjusted by 30 percent for the remaining years for the four-year scenario. The 30 percent adjustment was based on Tampa Electric's past experience.

Table 5: Estimated Corrective Maintenance Costs per Scenario

	Relation to Base $0.55M	2012 Cost	2013-2021 Annual Cost
Three-year cycle	-	$ 546,523	$546,523
Four-year cycle	30% increase	$ 546,523	$ 710,480

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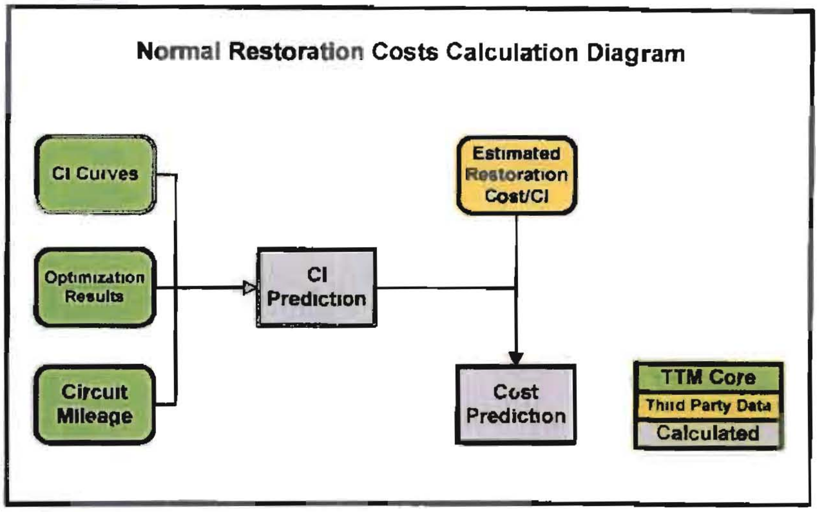
5.1.2. Normal Restoration Cost

The normalrestoration cost is derived from SAIFI projections, as enabled by the CI curves discussed in Subsection 3.1.3, and estimated costs to restore a customer in normal conditions. This is shown in Figure 8 below.

Figure 8–Normal Restoration Costs Calculation Diagram



5.1.3. Storm Restoration Costs

Each circuit was assigned an expected wind speed, based on data from Federal Emergency Management Agency (FEMA)'s Hazards United States(HAZUS) database, used in estimating damage from disasters. HAZUS gives the return speed experienced in a particular census tract every 10, 20, 50, 100, 200, 500 and 1,000 years. DCI converted these into annual probabilities of 10 percent, 5percent, 2percent, 1percent, etc., in order to derive an annual wind speed probability distribution and ultimately an expected wind speed value for each census tract. DCI then used the coordinates of each circuit (as derived in Subsection 2.1.1) for a given service area to estimate the center point of that service area, which then adopted the expected wind speed probability of the census tract closest to its center.

These wind speeds served as inputs to a damage prediction curve that also considered the number of years since a circuit had last been trimmed to generate an estimate of the percentage of customers on that circuit that would experience an outage. This CI prediction was then multiplied by the cost to restore one customer in storm conditions to derive the overall storm restoration cost. This is shown Figure 9 below.

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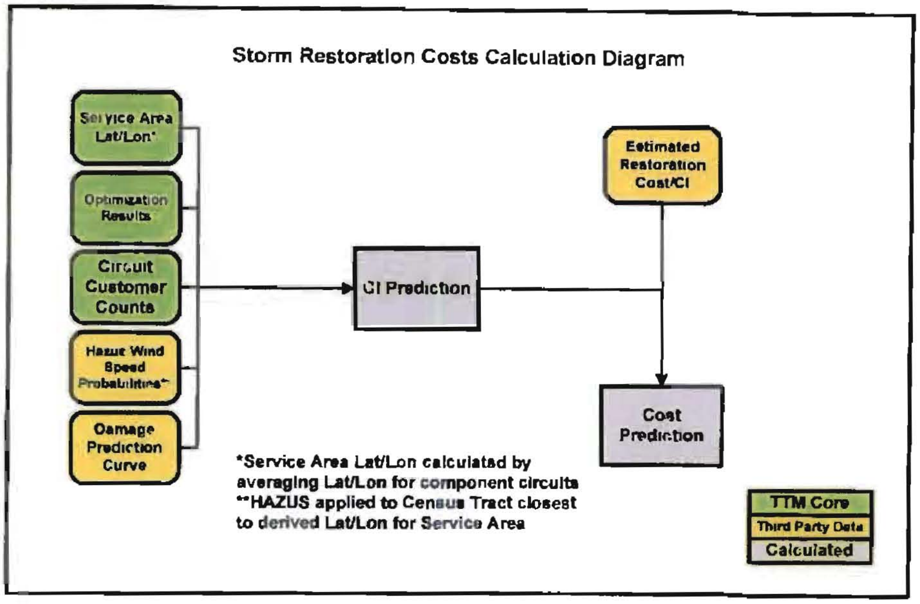
Figure 9 - Storm Restoration Cost Calculation Diagram



5.2. Analysis and Findings

In addition to evaluating the preventive trim cost and reliability performance, which were discussed in Section 4 of this report, the two scenarios were compared based on the estimate of total VM program related costs. The total VM program cost includes all the costs associated with preventive trimming, corrective maintenance associated with vegetation, normal restoration costs of vegetation caused outages and storm related restoration costs. This approach monetizes the value of the reliability associated with each scenario and incorporates the costs of responding to day-to-day outages that are caused by trees. This allows for the comparison of different scenarios on a NPV total cost basis and the determination of which scenario that will provide the lowest total cost to the customers.

When compared using this method, the NPV of the total VM program costs associated with the four-year cycle is $3.1 million lessthan that associated with the three-year cycle, making it a better option.Figure 10 and Table 6 below provide a breakdown of the VM associated costs over the next 10 years.

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Figure 10– Comparative Analysis of Overall Scenario Costs

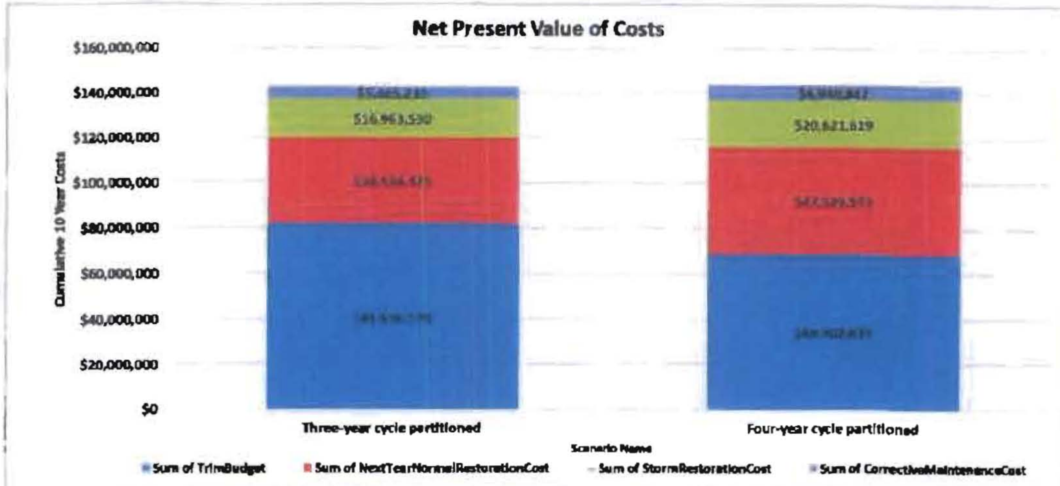

Table 6: 10-Year NPV of VM Program Costs

Scenarios	Cumulative Costs (2012 - 2021)				
	VM Trim Budget	Normal Restoration Costs from Tree Outages	VM Storm Restoration Costs	Corrective Maintenance Costs	Total VM Program Costs
Three-year cycle	$81.64	$38.53	$16.96	$5.47	$175.24
Four-year cycle	$68.70	$47.53	$20.62	$6.94	$172.17
Difference	$12.93	$-9.00	$-3.66	$-1.48	$3.06
Change %	16%	-23%	-22%	-27%	2%

Note: Cost figures are in millions of US$

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