

Illinois Commerce Commission
Assessment of Mt. Carmel Public Utility Company's
Reliability Report and Reliability Performance
for Calendar Year 2005

Pursuant to 83 Ill. Adm. Code 411.140

December, 2006

1. Executive Summary

Pursuant to Section 16-125 of the Illinois Public Utilities Act and the Commission's electric reliability rules as found in 83 Illinois Administrative Code, Part 411 ("Part 411"), Mt. Carmel Public Utility Company ("Mt. Carmel" or "MCPU") filed its annual electric reliability report for the 2005 calendar year. The annual reliability report Mt. Carmel filed was organized to sequentially follow the reporting requirements of Part 411, and though poorly formatted did comply with the requirements found therein.

Mt. Carmel's system average interruption frequency index ("SAIFI"), customer average interruption frequency index ("CAIFI"), and customer average interruption duration index ("CAIDI") all improved during the 2005 calendar year when compared to 2004. These improved indices indicate that Mt. Carmel's customers, on average, experienced fewer and shorter interruptions in 2005 than in 2004. Despite the improvement, Mt. Carmel's SAIFI reliability index remains below average when compared to the indices of all the reporting utilities due in a large part to two outages that interrupted the only two power supplies to Mt. Carmel.

During the summer of 2006, Staff inspected three of Mt. Carmel's distribution circuits that had relatively high SAIFI values in 2005. Staff found Mt. Carmel's distribution facilities to be generally in good condition. All the observed potential problems were on Circuit 21000 which is very long and serves approximately 22% of MCPU's customers. Of the twelve specific problems observed, all were either vegetation conflicts or damaged hardware. Staff provided Mt. Carmel with a summary of its inspection findings.

To improve its reliability performance, Staff suggests that Mt. Carmel strive to reduce SAIFI by: conducting more frequent inspections of its overhead distribution lines and responding to its inspection findings with corrective actions promptly; increasing animal guard coverage in problem areas; and continuing to improve its tree-trimming program. Staff also suggests Mt. Carmel continue to investigate ways to reduce the length of its rural circuits thereby improving the reliability of those circuits and investigate ways to increase the reliability of the transmission system that provides power to MCPU's distribution circuits.

Other Staff suggestions are for Mt. Carmel to correct its inaccurate calculation of worst performing circuit reliability indices as soon as possible, improve its investigation and reporting of the root cause of each outage, and improve the formatting of its annual reliability report to make it more readable.

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2. Introduction

Beginning with the year 1999, and at least every three years thereafter, 83 Illinois Administrative Code Part 411.140 requires the Commission to assess the annual reliability report of each jurisdictional entity and evaluate its reliability performance. Code Part 411.140 requires the Commission evaluation to:

- A) Assess the reliability report of each entity.
- B) Assess the jurisdictional entity's historical performance relative to established reliability targets.
- C) Identify trends in the jurisdictional entity's reliability performance.
- D) Evaluate the jurisdictional entity's plan to maintain or improve reliability.
- E) Include specific identification, assessment, and recommendations pertaining to any potential reliability problems and risks that the Commission has identified as a result of its evaluation.
- F) Include a review of the jurisdictional entity's implementation of its plan for the previous reporting period.

Mt. Carmel Public Utility Company (Mt. Carmel) is one of three electric utilities in Illinois that were exempted from the requirements of the Commission's electric service reliability policy (83 Ill. Adm. Code 410, Subpart C) as of December 16, 1997, and were not required to maintain records reflecting such information for any period prior to January 1, 2002. Because of that exemption, Mt. Carmel's annual reliability report for calendar year 2005 is its fourth annual reliability report to the Commission.

This document provides Staff's assessment of the annual reliability report covering calendar year 2005 filed by Mt. Carmel on June 1, 2006, revised and re-filed on August 9, 2006, and Staff's evaluation of Mt. Carmel's reliability performance for calendar year 2005. This report is organized to include all of the above listed requirements.

3. Mt. Carmel's 2005 Customer Base and Service Territory

As reported in its annual reliability report, Mt. Carmel Public Utility Company provided electric service to approximately 5,700 customers in Illinois in 2005. Mt. Carmel's service territory covers approximately 107 square miles, including one incorporated municipality (the City of Mt. Carmel), small communities, and rural areas in central and northern Wabash County.

4. Mt. Carmel's Electric Distribution System

Approximately 97.7% (258 miles) of Mt. Carmel's electric distribution system is overhead, with the remaining 2.3% (6.8 miles) being underground. 30% of Mt. Carmel's circuit miles consist of urban distribution facilities. Mt. Carmel reported that it has two transmission

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substations, three distribution substations, twelve distribution feeders (all 12 kV), and four industrial/wholesale substations.

Code Part 411.120(b)(3)(G) requires the utilities to report on the age of their transmission and distribution facilities. Mt. Carmel estimates the approximate average age of its transmission facilities to be 21 years, with an average remaining life of approximately 9 years. Mt. Carmel estimates the approximate average age of its distribution facilities to be 22 years, with an average remaining life of 8 years.

5. Assessment of Mt. Carmel's 2005 Reliability Report

Mt. Carmel filed its annual electric reliability report for calendar year 2005 on June 1, 2006, as required by Section 16-125 of the Public Utilities Act and the Commission's electric reliability rules in 83 Illinois Administrative Code, Part 411. Mt. Carmel filed a revised version of their annual reliability report on August 9, 2006 which corrected errors found in the June 1 filing. Mt. Carmel's report, though poorly formatted, is organized in such a way that the information sequentially follows the pattern of Code Part 411.

Mt. Carmel should correct the formatting errors found in the 2005 report so that future reports will appear more professional and will be more readable.

6. Mt. Carmel's Historical Performance Relative to Established Reliability Targets

Code Part 411.140(b)(4)(A-C) establishes electric service reliability targets that jurisdictional entities (utilities) must strive to meet. These targets specify limitations on customer interruptions as well as hours of interruption that a utility must strive not to exceed on a per customer basis. Code Part 411.120(b)(3)(L) requires each utility to provide a list of every customer, identified by a unique number, who experienced interruptions in excess of the service reliability targets, the number of interruptions and interruption duration experienced in each of the three preceding years, and the number of consecutive years in which the customer has experienced interruptions in excess of the service reliability targets.

In April 2004, Mt. Carmel Public Utility Company, along with all other regulated Illinois electric utilities, agreed to report on all interruptions (controllable and uncontrollable) as defined in Code Part 411.20 in relation to the service reliability targets for the reporting periods of 2003 through 2007, and to include the specific actions, if any, that the utility plans or has taken to address the customer reliability concerns.

Table 1 lists the customer service reliability targets.

Table 1
CUSTOMER SERVICE RELIABILITY TARGETS

Immediate primary source of service operation voltage	Maximum number of interruptions in each of the last three consecutive years	Maximum hours of total interruption duration in each of the last three years
69kV or above	3	9
Between 15kV & 69kV	4	12
15kV or below	6	18

In its 2005 reliability report, as was the case in 2004, Mt. Carmel stated that it had no customers who experienced interruptions in excess of the service reliability targets.

Mt. Carmel did report that 3 of its customers experienced more than six interruptions in 2005 versus 85 customers that experienced more than six interruptions in 2004. This is discussed further in Section 8 of this report.

7. Analysis of Mt. Carmel’s Year 2005 Reliability Performance

Table 2 shows Mt. Carmel’s company-wide reliability indices for calendar year 2005 compared to the other seven reporting Illinois electric utilities. This data indicates that Mt. Carmel was the most reliable electric utility in Illinois in terms of average duration of customer interruptions (CAIDI) in 2005. In terms of average frequency of system interruptions (SAIFI), even though the index value improved from 2004, during 2005 Mt. Carmel still had the next to worst overall SAIFI index value.

All of Mt. Carmel’s overall company-wide reliability indices improved greatly from year 2004. SAIFI improved from 2.69 in 2004 to 1.39 and CAIDI improved from 177 in 2004 to 66 in 2005. Mt. Carmel stated that the overall improvement is in part due to an aggressive tree-trimming program, a reduction in severe storms in 2005, and a lower number of transmission supply outages.

Even though Mt. Carmel cannot control the number of severe storms, it does have some control over how many customers lose power from the storms by how it trims trees and it repairs and maintains its lines. Mt. Carmel should continue its aggressive tree-trimming program and implement the recommendations found in this report.

In 2005, Mt. Carmel reported that it had two cases that its transmission sources opened. These two power supply interruptions resulted in all of Mt. Carmel’s customers being without power at least one time in 2005. In 2004, Mt. Carmel had two transmission supply outages but each of those two outages affected a larger portion of Mt. Carmel’s electrical system than in 2005. If the two transmission supply interruptions in 2005 had not occurred Mt. Carmel would have had the best overall SAIFI of all the reporting electric utilities. Mt. Carmel should investigate ways to improve its transmission supply to reduce the number of Mt. Carmel customers that experience power interruptions when its transmission lines open.

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Note: The comparison of company-wide reliability indices for Illinois electric utilities should indicate relative reliability levels achieved. The reader of this report should keep in mind that each Illinois electric utility has a unique electric system, a unique group of customers, and a unique method of defining, recording, and reporting the interruption data. These differences make precise utility-to-utility comparisons difficult, especially when comparing Mt. Carmel's small geographical basis to any of the Ameren companies or ComEd.

Table 2
YEAR 2005 RELIABILITY INDICES FOR REPORTING UTILITIES

a) SAIFI		b) CAIDI		c) CAIFI	
UTILITY	SAIFI	UTILITY	CAIDI	UTILITY	CAIFI
Interstate	0.54	Mt. Carmel	66	Interstate	1.3
South Beloit	0.69	MidAmerican	72	South Beloit	1.42
ComEd	1.18	ComEd	104	Mt. Carmel	1.43
AmerenCILCO	1.23	AmerenCIPS	112	AmerenIP	1.81
AmerenCIPS	1.38	South Beloit	135	ComEd	1.95
AmerenIP	1.38	Interstate	161	AmerenCILCO	2.02
Mt. Carmel	1.39	AmerenCILCO	165	AmerenCIPS	2.12
MidAmerican	1.77	AmerenIP	196	MidAmerican	2.38

$$\text{SAIFI} = \frac{\text{Total \# Customer Interruptions}}{\text{Total \# Customer Served}}$$

$$\text{CAIDI} = \frac{\text{Sum of all Interruption Durations}}{\text{Total \# Customer Interruptions}}$$

$$\text{CAIFI} = \frac{\text{Total \# Customer Interruptions}}{\text{Total \# Customers Affected}}$$

Table 3 lists the number of Mt. Carmel reported interruptions since 2002. The total number of interruptions reported for 2005 (339) is down over 30% from the same data reported for year 2004 (495). Until 2005, the total number of interruptions had increased each of the three years that Mt. Carmel had filed its annual reliability report. Staff will continue to monitor this trend in future years and report any variance.

Table 3
Number of interruptions

Year	# of interruptions
2002	248
2003	310
2004	495
2005	339

Table 4 shows a breakdown of thirteen causes of sustained customer interruptions (events) by cause category, as reported by Mt. Carmel for year 2005. As was the case in 2004, Mt. Carmel reported that weather caused the highest percentage of customer interruptions in 2005 (22%). Overhead equipment also caused 22% of the interruptions in 2005, and animals were the third highest cause at 11% of the total interruptions. The number of weather-caused interruptions (76) is almost 100 interruptions less than the 173

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attributed to that cause in 2004. Only overhead equipment related (76 in 2005 versus 73 in 2004) and customer equipment interruptions (27 in 2005 and 24 in 2004) increased in 2005 from 2004.

As is noted in Staff's review of Circuit 21000, Froman Drive Feeder, Staff believes that Mt. Carmel incorrectly classified many of the interruptions as being caused by overhead equipment instead of reporting the root causes for the interruptions. Mt. Carmel should emphasize the need to report the root causes of each interruption with its linemen.

Table 4
TOTAL INTERRUPTIONS BREAKDOWN BY CAUSE

Interruption Cause Category	Events	Percent of Events	Customers Interrupted	Percent of Customer Interruptions
Animal Related	39	11.5%	460	5.2%
Tree Related	30	8.9%	292	3.3%
Employee/Contractor Personnel Errors	0	0	0	0
Underground Equipment Related	0	0	0	0
Transmission/Substation Equipment Related	1	0.3%	3450	39.2%
Weather	76	22.4%	550	6.3%
Intentional/Maintenance	44	13.0%	845	9.6%
Other Alternative Supplier/Utility	0	0	0	0
Customer Equipment	27	8.0%	48	0.6%
Public *	11	3.2%	2296 *	26.1% *
Overhead Equipment Related	76	22.4%	597	6.8%
Unknown	35	10.3%	255	2.9%
Other	0	0	0	0
TOTAL:	339	100.0%	8793	100.0%

* The number and percentage of customers interrupted in the "Public" cause category includes a total of 2,137 customers that were interrupted when Mt. Carmel's 69kV source was lost due to a third party contact with a down guy.

Code Part 411.120(b)(3)(I)&(J) requires the reporting utility to list its worst performing circuits (subsection I) and then state (subsection J) what corrective actions are planned to improve those circuits' performance. As discussed in more detail on page 9 – Outage Reporting - of this report, Mt. Carmel incorrectly calculated the worst performing circuit reliability indices. Mt. Carmel stated that starting with the 2006 annual reliability report they would use the correct calculations.

Table 5 shows the Mt. Carmel circuits with the highest (worst) reliability indices for 2005 along with the circuits inspected as part of Staff's review of Mt. Carmel's 2005 reliability. To obtain an overall impression of Mt. Carmel's reliability performance throughout its

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system Staff inspected two urban and one rural circuit (marked with asterisks *). The bolded values represent the indices that caused the circuit to be a worst performer.

Table 5
MT. CARMEL'S CIRCUITS WITH HIGHEST SAIFI, CAIFI, & CAIDI
CALENDAR YEAR 2005 **

<u>AREA</u>	<u>CIRCUIT</u>	<u>SAIFI</u> **	<u>CAIFI</u> **	<u>CAIDI</u> ** (minutes)
Froman Dr. Feeder*	21000*	1.72	1.74	85
Allendale Feeder	22000	1.61	1.64	79
Circuit #3*	13000*	1.34	1.39	54
West 9th St. Feeder*	32000*	1.21	1.24	74

** Mt. Carmel reliability values were not corrected.

The field inspections allow Staff to verify that work was performed on the circuits as reported by the utilities and to see if there are any apparent reasons for poor performance of these circuits. Staff also notes any problems with the facilities it observes which may pose a threat to future service reliability or to public safety. For example, Staff looks for poor tree trimming practices, broken poles, split crossarms, damaged electrical devices, etc.

Summaries of items noted by Staff during the field inspections of the selected Mt. Carmel distribution circuits this year are included in this report as Attachment "A". (As mentioned to Mt. Carmel when providing them with a copy of these summaries in July, the summary for each of the circuits inspected represents typical observations noted by ICC Staff during the field inspections and is not intended to represent all of the problems or potential problems that may exist on each circuit. Also, Staff's inspections are not intended to take the place of the thorough, detailed inspections that should be performed periodically by the utility company.)

Circuit 21000 – Froman Drive Feeder

SAIFI=1.72 CAIDI=85 CAIFI=1.74

This 12kV circuit, was the 2005 worst performing circuit for all three reliability indices; SAIFI, CAIFI, and CAIDI. The circuit serves 1247 customers (approximately 22% of MCPU's total) in a large area to the north and northwest of Mt. Carmel, including the villages of Friendsville and Lancaster. This circuit is very long with approximately 75 miles of line exposure.

Of the eighty-one outages on this circuit in 2005, one was a total circuit outage caused by the loss of the 69kV transmission line that feeds this circuit. Eighteen of the outages Mt. Carmel reported were caused by weather, twelve were animal related, twenty-seven were due to distribution equipment problems, six were due to trees, and the remaining were either unknown causes or due to the public. Mt. Carmel reported that their general three-year cycle tree trimming of the circuit is on schedule. Staff noticed many locations of recent tree trimming. Mt. Carmel last inspected this circuit in January 2006.

As part of the field inspection of this circuit, Staff found fifteen locations where the circuit's reliability could be compromised. See Attachment A for a complete description of the

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fifteen locations. Six of these locations Staff found trees or vines growing near or into the primary conductor(s). Considering this circuit was reported to be on its three year cycle tree trimming schedule Staff did not expect to find this many tree related problems during the inspection of the circuit. Staff recommends Mt. Carmel continue its three year tree trimming cycle and improve its coverage to reduce the number of missed trees.

Of the remaining nine locations found during the field inspection of this circuit, six were poles and/or hardware were found to be in bad or deteriorated condition, two were areas that Mt. Carmel should consider adding lightning arresters, and the last location was an area that additional animal protection should be considered.

Photo #1 is an example of some of the tree conditions and photo #2 is an example of some of the bad or deteriorated conditions found on this circuit during Staff's inspection.

Photo #1
On Highway 11 east of E700 Road
Tree into conductors



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Photo #2

At N2100 Lane & E1000 Road north of Mt. Carmel
Weathered and split crossarm



Mt. Carmel did report various projects that were underway that should improve the voltage along the circuit but will have minimal impact on the reliability of this circuit. Mt. Carmel also listed many small maintenance or new construction projects that Mt. Carmel completed in 2005 that will improve the reliability of the circuit. These projects included pole replacements, relocation of overhead facilities, replacing lightning arrestors and fuse installations.

Staff believes that Mt. Carmel could better classify a large percentage of the twenty-seven distribution equipment related outages (one-third of the total number of interruptions). Mt. Carmel reported that fuses and cutouts caused seven of the distribution equipment outages. Staff believes that most of those fuses and cutout outages were not caused by the failure of the fuse or cutout but instead the fuse or cutout opened because of some other disturbance on the line. Mt. Carmel should try to find the root cause of each outage not report the device that opened.

Given the length of this circuit (75 miles) Staff was pleased with the overall condition of distribution facilities but Staff is concerned that Mt. Carmel is not making an effort to reduce the length of this circuit by transferring a portion of the load to adjacent circuits. Any reduction in the overall circuit length will lower the likelihood of outages (less miles of line exposure) to the 22% of Mt. Carmel's customers served from this circuit.

Circuit 13000 – Circuit #3

SAIFI=1.34 CAIDI=54 CAIFI=1.39

This 12kV circuit, a 2005 next to worst performing circuit due to SAIFI and CAIFI, serves 344 customers in Mt. Carmel. This circuit is very short with only 4.3 miles of line exposure. Most of the circuit is located on the same pole line as other Mt. Carmel distribution circuits.

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Of the eight interruptions, one was a total circuit outage due to an outage to the 138kV source to this circuit. Of the remaining seven interruptions, three were by distribution equipment problems, two by weather, and two were unknown causes. Mt. Carmel reported that it made no major improvements in 2004 or 2005 to this circuit and no major improvements are planned. Mt. Carmel last inspected this circuit in August 2004.

Staff inspection of this circuit found no problems or concerns. Given the observed good condition of distribution facilities that make up this circuit, Staff expects that Circuit 13000 will perform reliably in the future.

Circuit 32000 – West 9th St. Feeder

SAIFI=1.21 CAIDI=74 CAIFI=1.24

This 12kV circuit, a 2005 next to worst performing circuit due to SAIFI, CAIFI and CAIDI, serves 324 customers in Mt. Carmel. This circuit serves mainly the western portion of the City of Mt. Carmel.

Of the nine outages on this circuit in 2005, one was a total circuit outage caused by an outage to the 138kV source to this circuit. Two of the outages Mt. Carmel reported were caused by weather, four were due to distribution equipment problems, and two were due to animals. Mt. Carmel reported that it completed the general three-year cycle tree trimming of the circuit in March 2005, also that this circuit was last inspected in August 2004.

Mt. Carmel installed sectionalizing equipment and reclosers on this circuit in 2005 to allow it to transfer a portion of this circuit to a new circuit out of the new West 3rd St. Substation in 2007. Note, this new substation will reduce the length of some circuits but it will not improve the reliability of the transmission system to deliver power to the Mt. Carmel distribution system nor will the substation reduce the susceptibility customers currently have to loss power when transmission outages occur.

Staff inspection of this circuit found no problems or concerns. Given the observed good condition of distribution facilities that make up this circuit and the expected transfer of a portion of the circuit to a new feeder, Staff expects that Circuit 32000 will perform reliably in the future.

Tree Trimming:

On May 1, 2006, Staff inspected tree conditions at locations within the City of Mt. Carmel. Staff found Mt. Carmel's tree trimming was noticeably better than what was observed in recent years. Even though there was noticeable improvement, Staff did observe several isolated locations that had significant remaining tree conflicts.

Attachment B is Staff's report on its 2006 findings of Mt. Carmel's tree trimming effort. Staff is recommending, in its report, that Mt. Carmel should continue its recovery program and in some ways improve further.

Outage Reporting

Staff believes that Mt. Carmel could better classify its reported outages. Based on the findings from Staff's review of the outage information for Circuit 21000, Mt. Carmel reported distribution fuse and cutout operations as causes of outages instead of reporting the disturbance that caused the fuses and cutouts to operate. Mt. Carmel should try to find the

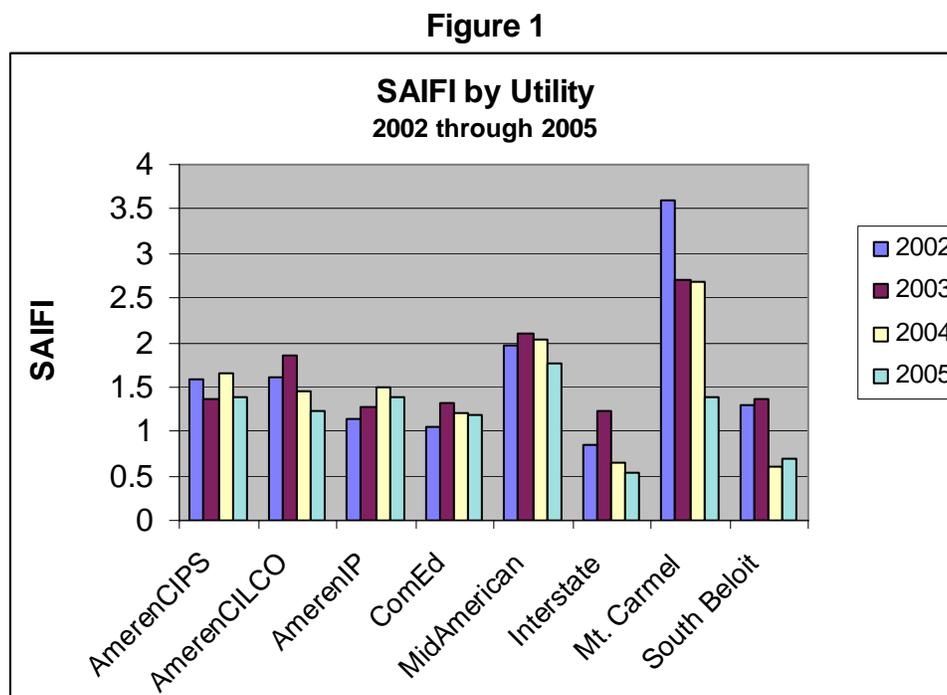
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root cause of each outage and not report the device that opened as the root cause of the outage.

Mt. Carmel incorrectly calculated the worst performing circuit reliability indices by including system outages (outages at substations and on the transmission system) in the calculations. This error resulted in the SAIFI and CAIFI worst performing circuit reliability indices to appear worse than is the actual case. The CAIDI worst performing circuit index may improve or worsen with the removal of the system outage data. Mt. Carmel did correctly calculate the system-wide reliability indices by including the system outage data. Mt. Carmel stated that starting with next year's annual reliability report they would use the correct calculations for worst performing circuits.

8. Trends in Mt. Carmel's Reliability Performance

Figure 1 shows a comparison of company-wide SAIFI values reported by the Illinois utilities for years 2002 through 2005. Mt. Carmel reported 2005 company-wide SAIFI performance improved greatly from all the previous yearly reported values. Even though Mt. Carmel did report the next to worst SAIFI for 2005 Staff is pleased with the improvement in Mt. Carmel's company-wide SAIFI value.



Mt. Carmel appears to be establishing a favorable trend in its reported overall SAIFI reliability performance that shows Mt. Carmel customers are experiencing improved reliability. Staff will continue to follow this trend in future years and report on any variations that occur.

Figure 2 shows a comparison of SAIFI values for each company's single worst performing circuit as reported by the Illinois utilities for years 2001 through 2005. Mt. Carmel's

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reported 2005 worst-circuit SAIFI performance of 1.72 was the second lowest (best) of all the eight reporting Illinois utilities for 2005 only South Beloit reported better worst-circuit SAIFI than Mt. Carmel. Mt. Carmel has established a significant trend of consistently having one of the best reported worst-circuit SAIFI index.

As noted previously, Mt. Carmel incorrectly included system outages (outage at the substation or transmission system level) when calculating their worst performing circuit reliability indices. This calculation error makes the worst performing circuit reliability SAIFI index worse. Mt. Carmel has stated that starting with next year's 2006 reliability report they will use the correct calculations.

Figure 2

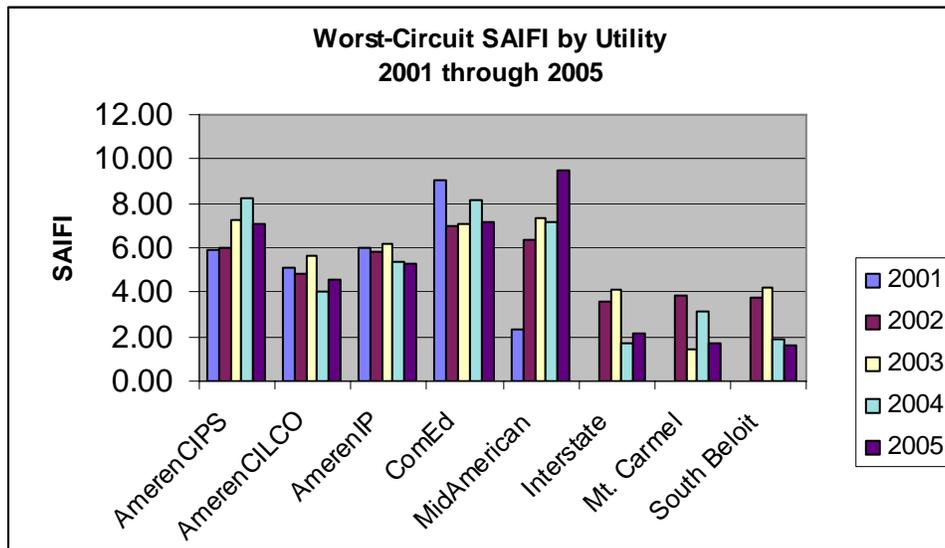
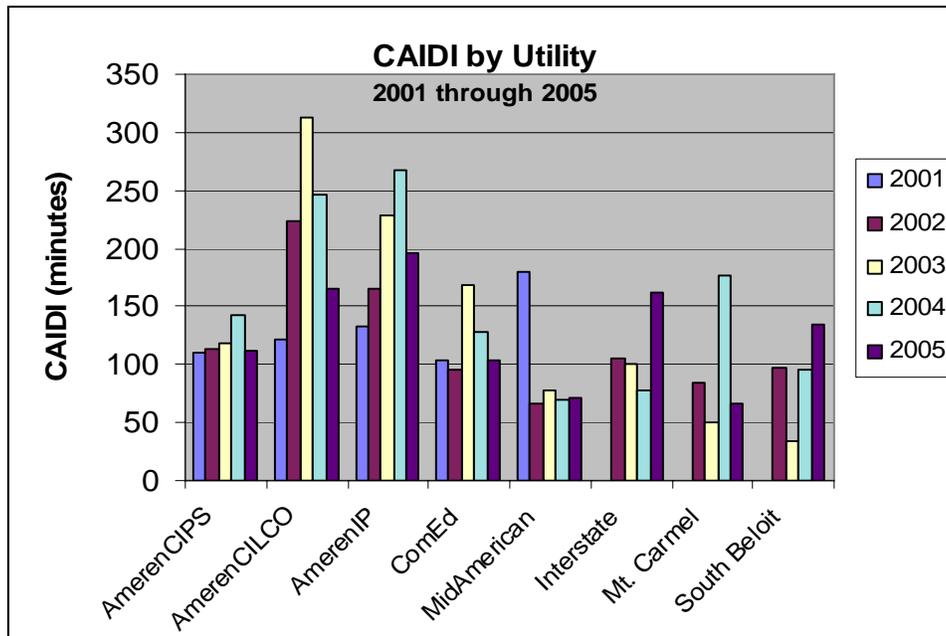


Figure 3 shows a comparison of company-wide CAIDI values reported by the Illinois utilities for years 2001 through 2005. At 66 minutes, Mt. Carmel's reported 2005 company-wide CAIDI performance was the best reported by the eight-utility group. Mt. Carmel's 2005 company-wide CAIDI was significantly lower (better performance) from its reported overall CAIDI for 2004 of 177 minutes. Mt. Carmel reported that the improved CAIDI value was due in part to a reduced number of system-wide storms during 2005 compared to 2004 and its aggressive tree-trimming program.

Figure 3



As stated earlier, 2002 was the first year of reliability reporting for Mt. Carmel and it has not yet established a significant trend of its reported company-wide CAIDI reliability performance.

Figure 4 shows a comparison of CAIDI values for each company’s single worst performing circuit as reported by the Illinois utilities for years 2001 through 2005. Mt. Carmel’s reported 2005 worst-circuit CAIDI performance of 85 minutes was significantly better than the remaining seven reporting Illinois utilities for 2005; MidAmerican had the second best worst-performing CAIDI at 507 minutes. Mt. Carmel has consistently reported one of the lowest worst-circuit CAIDI.

As noted previously, Mt. Carmel incorrectly included system outages (outage at the substation or transmission system level) when calculating their worst performing circuit reliability indices. Because of this calculation error the worst performing circuit reliability CAIDI index maybe worse. Mt. Carmel has stated that starting with next year’s 2006 reliability report they will use the correct calculations.

Figure 4

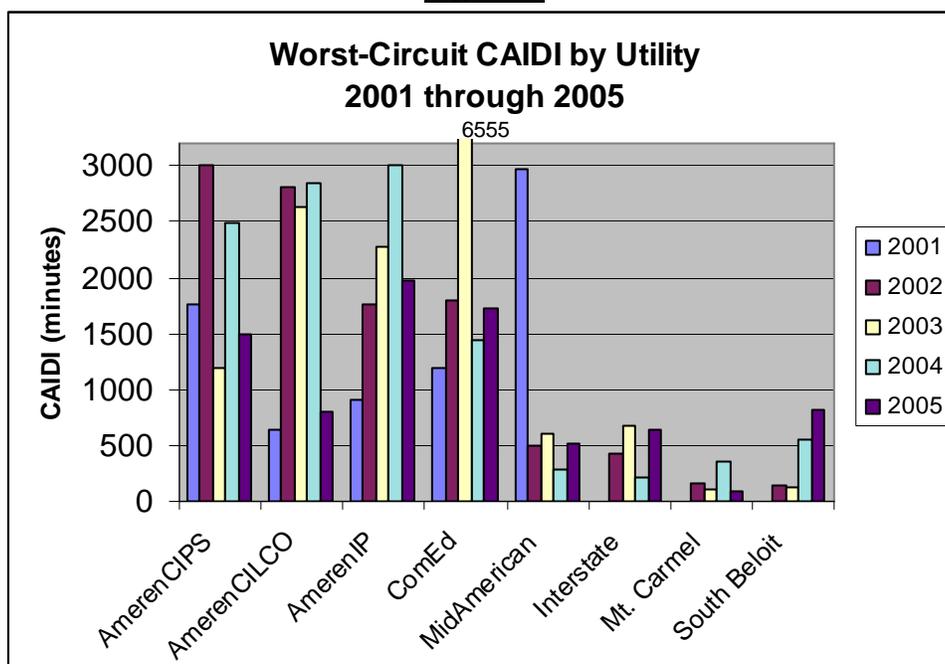


Table 6 shows the number and percentage of Mt. Carmel customers who experienced no service interruptions or less than four service interruptions for years 2002 through 2005. While only four years of data, it is worth noting that the number of customers that experienced no interruptions has decreased slightly from year 2004 but still higher than 2002 and 2003 values. The number of customers that had experienced less than four interruptions is the highest of the four years of data and increased by over 30% from 2004.

Table 6

Mt. Carmel Customers with No Interruptions or Less Than Four Interruptions

Year	Total Customers	Customers with No interruptions	Customers with < 4 interruptions
2002	5,923	0 0.00%	3,656 61.7%
2003	5,746	21 0.37%	4,809 83.7%
2004	5,761	342 5.9%	4,231 73.4%
2005	5,893	162 2.7%	5,556 94.3%

Table 7 shows the number and percentage of Mt. Carmel customers who experienced more than six and more than ten service interruptions for the years 2002 through 2005. It is noteworthy that only three customers experiencing more than six interruptions in 2005 down from 85 in year 2004.

Table 7
Mt. Carmel Customers with More Than Six and More Than Ten Interruptions

Year	Total Customers	Customers with > 6 interruptions	Customers with > 10 interruptions
2002	5,923	298 5.0%	0 0.0%
2003	5,746	38 0.7%	0 0.0%
2004	5,761	85 1.5%	8 0.1%
2005	5,893	3 0.1%	1 0.0%

Overall, the statistics provided in Mt. Carmel's 2005 reliability report indicate overall improvement in frequency of interruptions and in duration of interruptions when compared to similar data provided for previous years. However, the statistics still indicate that the reliability, in terms of SAIFI, Mt. Carmel has room for improvement.

9. Mt. Carmel's Plan to Maintain or Improve Reliability

Plans described in Mt. Carmel's annual reliability report to maintain or improve reliability include:

- Continue to install animal protection at new transformer installations as well as at locations which experience animal related interruptions.
- Continue the three year tree trimming plan that was started on July 1, 2004.
- Review circuit interruption data to determine if the installation of more sectionalizing devices, or facility rebuild or relocation is necessary to improve reliability.
- Reconnector and extend Circuit 31000--West 3rd Street Feeder to allow approximately one-half of the circuit to be transferred to a new circuit out of the new West 3rd Street Substation (scheduled for completion in 2007).
- Construct a new substation southwest of Mt. Carmel and two new feeders, to supply some of the load presently on Circuit 31000 (West 3rd Street Feeder) and to allow for future growth in an industrial park (scheduled for completion in 2007).
- Install a line recloser in Circuit 22000 (Allendale Feeder) in an effort to further sectionalize the outer reaches of this circuit.

Table 8 lists Mt. Carmel's reported annual expenditures for its distribution system, tree trimming, and transmission system for years 1999 through 2005, and its 2006 through 2008 budgets for these categories. The historical and budget amounts for the distribution system for the period 2000-2008 and for tree trimming for the period 2000-2008 is also represented graphically in Figures 5 and 6, respectively.

The proposed overall distribution capital budget for years 2006, 2007 and 2008 is much less than what Mt. Carmel spent in years 1999-2005. This is a concern to Staff since Mt. Carmel's overall reliability indices would indicate that Mt. Carmel should be increasing (or at least maintaining the same spending) not decreasing its planned spending in an attempt to improve its reliability. Staff will continue to track Mt. Carmel's spending and system

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improvements in future years to ensure that its customers' reliability is not being compromised.

Table 8

Year	Distribution			Tree	Transmission		
	Capital	O & M	Total	Trimming	Capital	O & M	Total
1999	\$365,431	\$768,379	\$1,133,810	\$345,116	\$65,109	\$10,844	\$75,953
2000	\$365,805	\$723,636	\$1,089,441	\$384,818	\$10,289	\$11,745	\$22,034
2001	\$510,468	\$665,064	\$1,175,532	\$289,192	\$28,429	\$100,000	\$128,429
2002	\$515,670	\$681,280	\$1,196,950	\$291,206	\$50,593	\$383,776	\$434,369
2003	\$561,635	\$742,584	\$1,304,219	\$296,366	\$7,946	\$347,925	\$355,871
2004	\$2,177,822	\$805,495	\$2,983,317	\$257,037	\$1,247	\$44,023	\$45,270
2005	\$596,069	\$960,436	\$1,556,500	\$385,448	\$6,580	\$51,324	\$57,900
2006 Budget	\$175,000	\$825,000	\$1,000,000	\$240,000	\$235,000	\$50,000	\$285,000
2007 Budget	\$50,000	\$850,000	\$900,000	\$315,000	\$10,000	\$50,000	\$60,000
2008 Budget	\$50,000	\$855,000	\$905,000	\$310,000	\$10,000	\$50,000	\$60,000

Figure 5 shows that Mt. Carmel plans to hold its distribution O&M expenditures for the next three years at slightly above its historical average and its distribution capital expenditure well below its historical average. After a large distribution capital increase in 2004, primarily for the construction of a new distribution substation, Mt. Carmel's budget calls for significant distribution capital decreases in 2006 through 2008, to levels well below that spent in any of the past years going back to at least 2000. As mentioned previously, this trend does not indicate that Mt. Carmel is attempting to improve its system and at that level of spending, it is hard to see Mt. Carmel maintaining the status quo let alone improving.

2005 Reliability Assessment: Mt. Carmel Public Utility Co.

Figure 5

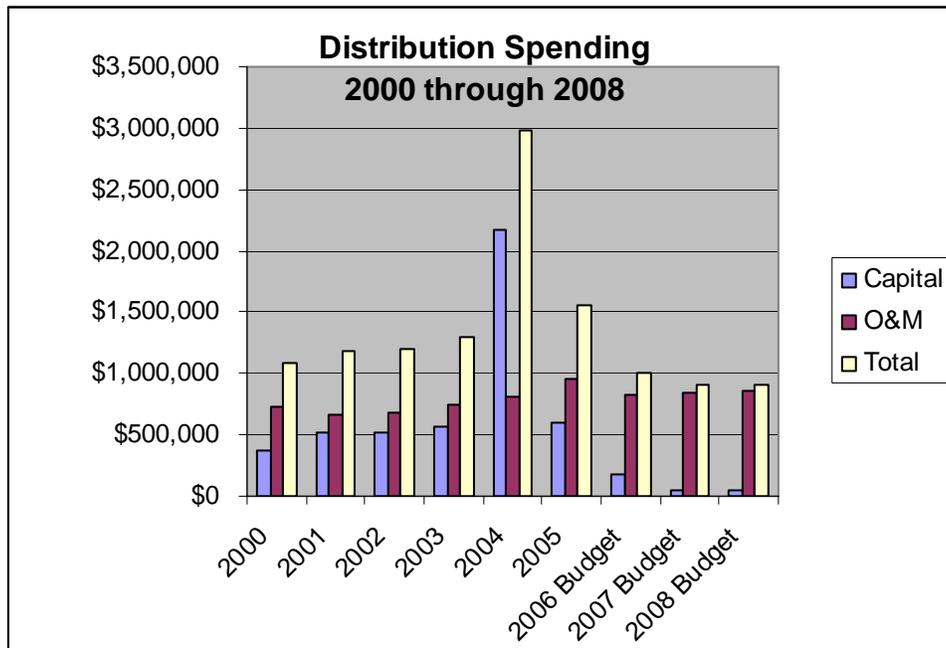
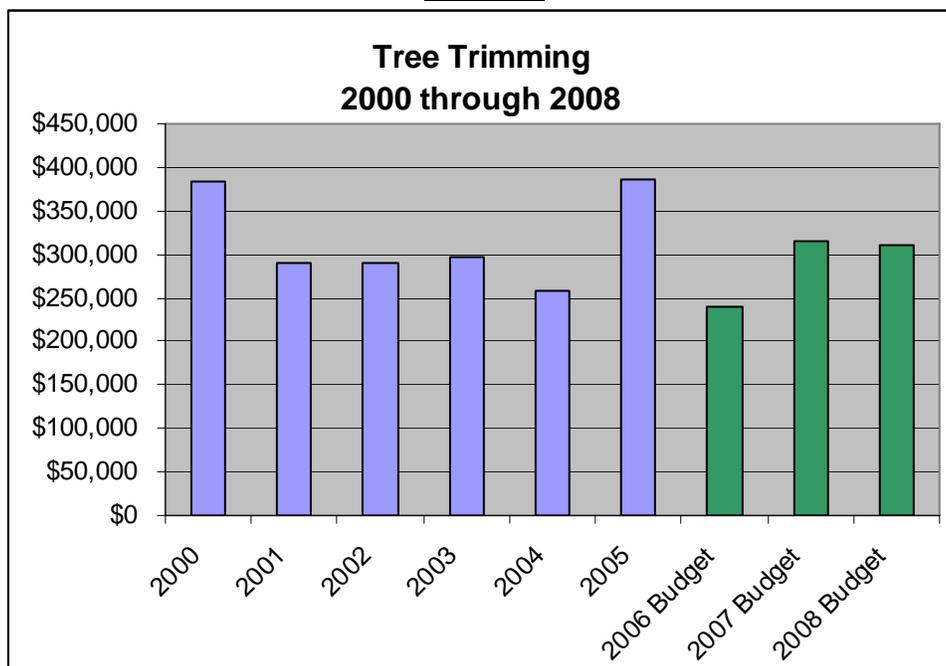


Figure 6 shows that the planned tree trimming expenditures for the next three years.

Figure 6



Mt. Carmel has stated that it “has implemented a plan, beginning July 1, 2004, which should allow for the distribution system to be trimmed on a three year cycle.” It does not appear to Staff, however, that Mt. Carmel’s tree trimming budget for the next three years and specifically year 2006, will be sufficient. For year 2006, Mt. Carmel has budgeted the

2005 Reliability Assessment: Mt. Carmel Public Utility Co.

lowest tree-trimming budget since before 2000. Even though few serious tree related problems were observed by Staff or noted by Staff in its June 23, 2006 tree inspection report (Attachment B), Staff is concerned that Mt. Carmel may not be funding its tree trimming effort sufficiently to continue to implement its three year cycle. Staff will continue to investigate Mt. Carmel's tree trimming effort and funding.

Mt. Carmel provided a description of actions taken or planned for each of the worst performing circuits listed in its 2005 reliability report. Each of the problems described in the outage history for each circuit was addressed in some way by the described actions taken or planned. Mt. Carmel's reported actions taken or planned for each circuit seemed reasonable, but it should also address any additional problems revealed on each of the circuits during Staff's circuit inspections.

10. Potential Reliability Problems and Risks

Mt. Carmel's proposed distribution capital budget for years 2006 through 2008 is less than what Mt. Carmel spent in years 1999-2005. This is a concern to Staff since Mt. Carmel's overall reliability indices would indicate that Mt. Carmel should be increasing not decreasing its planned spending in an attempt to improve its reliability. With the reported lower budgeted funds Mt. Carmel will have difficulty even maintaining the status quo. In Staff's opinion, this means Mt. Carmel will have limited, at the best, improvement in their system reliability.

Mt. Carmel is on a tree trimming catch-up program currently with the goal of being on a three-year tree-trimming program by July 1, 2007. Even though few tree related problems were observed by Staff, Staff is concerned that Mt. Carmel may not be properly trimming trees or funding its tree trimming effort sufficiently to catch-up or implement its three year cycle. Staff will continue to investigate Mt. Carmel's tree trimming effort and funding.

Mt. Carmel needs to address all of the problems noted during Staff's circuit inspections.

11. Review of Mt. Carmel's Implementation Plan for the Previous Reporting Period.

Mt. Carmel reported that the remedial actions to be done in 2005 for each of its year 2004 worst performing circuits, described in its 2004 reliability report, were either completed, accomplished by other actions, or rescheduled because of reasons given. Upon reviewing the status of these planned actions for each circuit, Staff finds the corrective actions taken or revised to be reasonable.

12. Summary of Recommendations

1. Mt. Carmel should do whatever is necessary to achieve and maintain a three-year tree trimming cycle throughout its service territory. Mt. Carmel should verify it has budgeted sufficient funds to obtain and maintain a three-year tree trimming cycle.

2005 Reliability Assessment: Mt. Carmel Public Utility Co.

2. Mt. Carmel should reevaluate its budgeted funds for distribution capital to ensure there is sufficient funding to not only maintain the existing system but to improve it thereby improving the overall reliability its customers see.
3. Mt. Carmel should investigate reducing the length of the three long circuits on their system. Staff feels that Mt. Carmel could reduce the circuit lengths by dividing the circuits, transferring load to shorter urban circuits or by adding sectionalizing equipment to the circuit.
4. Mt. Carmel should investigate ways to improve its transmission supply to reduce the number of Mt. Carmel customers that experience power interruptions when transmission system outages occur.
5. Mt. Carmel should as quickly as possible correct its calculation process of the circuit reliability indices to remove system outages (outages at substations and on the transmission system) in the calculations.
6. Mt. Carmel could better classify its reported outages. Mt. Carmel should try to find the root cause of each outage and not report the device that opened as the root cause of the outage.
7. Mt. Carmel should correct the formatting errors found in the 2005 report so that future reports will appear more professional and will be more readable.

2005 Reliability Assessment: Mt. Carmel Public Utility Co.

Attachment A: Summary of Field Inspections

Mt. Carmel Public Utility Co.	Date:	6/7/06
Circuit #21000 (Froman Dr. Feeder)	Inspector:	R. Linkenback & L. Horrall
Item Description		Location
Vines growing into conductor (vines were cut day of inspection)		In alley east of Froman Dr. and Mulberry St.
No lightning arresters found on this road section		On E1920 Rd, east of E1000 Rd.
Tree burning in the line		On N1950 Blvd west of Friendsville Ave.
Weathered and split crossarm		Intersection of N2100 Blvd & E1000 Rd
Trees close to conductors		On N2100 Blvd and Friendsville Ave.
Woodpecker holes in pole		N2100 Ln west of Friendsville Ave.
Split pole top		N2100 Ln west of Friendsville Ave.
Woodpecker holes in pole and conductor burning in trees		On Hwy 11 west of Friendsville Ave.
Vines growing into conductor		North of Hwy 11 near N2300 Blvd.
Woodpecker holes in pole		On E750 Rd north of N2300 Blvd.
Trees growing into line		On Hwy 11 east of E700 Rd.
Tree burning in the line		On Hwy 11 east of E700 Rd.
Woodpecker holes in pole		On Wabash 17 Ave. west of E1000 Rd.
Animal guards needed in the area of trees		On Wabash 13 Ave. south of E850 Rd.
No evidence of lightning arresters in the area		On Wabash 13 Ave. south of Wabash 17 Ave.

Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

MEMORANDUM

TO: Roy Buxton, Engineering Department Manager

FROM: Jim Spencer, Senior Electrical Engineer

DATE: June 27, 2006

RE: Tree Conditions in Mt. Carmel Public Utility Company's Service Territory

1. Introduction

In my August 12, 2003, Staff Report to the Commission assessing Mt. Carmel Public Utility Company's (Mt. Carmel's) electric reliability performance for 2002, in my August 10, 2004, memorandum summarizing the results of my April 2004 tree trimming inspections in Mt. Carmel, and in my June 1, 2005, Staff Report to the Commission regarding tree trimming in Mt. Carmel's service territory, I made a common statement regarding the state of tree trimming in Mt. Carmel's service territory. In each of those documents I noted that inadequate tree trimming was the single biggest risk to electric service reliability at Mt. Carmel Public Utility Company.

I found many conflicts between trees and Mt. Carmel's circuits during field inspections of three Mt. Carmel distribution circuits in May 2003. During my April 2004 inspection of tree conditions in Mt. Carmel and a portion of the company's rural service territory, I noticed that Mt. Carmel had trimmed the trees near its distribution circuits at several locations since May 2003, but that it still had a long way to go to have reasonable tree clearance conditions throughout its service territory.

I worked with officials of Mt. Carmel Public Utility Company to arrive at a voluntary written agreement dated January 25, 2005, in which Mt. Carmel committed "to assure that all of its electric circuits are in compliance with a three-year tree trimming cycle and are trimmed and maintained in accordance with National Electrical Safety Code (NESC) Rule 218 by July 1, 2007."

I again inspected tree conditions near Mt. Carmel's circuits within the City of Mt. Carmel on May 1, 2006. I performed the inspections by driving around and looking at trees near Mt. Carmel overhead electric lines without regard to circuit identification and without the use of circuit maps. Larry Horrall, Mt. Carmel's Vice President of Operations, accompanied me on these inspections.

This memorandum documents the results of the May 1, 2006, field inspection and my assessment of the state of tree trimming on that date near Mt. Carmel's overhead electric lines.

Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

2. Findings

Mt. Carmel has made very noticeable progress in its tree trimming program since my inspection there in April 2004. It reported that 100% of the trees within the City of Mt. Carmel were trimmed prior to my inspection there on May 1, 2006, and I could easily tell that tree trimming had significantly improved in the city during my inspection. I did find several isolated locations of remaining tree conflicts during the May 2006 inspection, however, which Mt. Carmel needs to address. These trees were either missed or inadequately trimmed when scheduled. I have summarized my field notes involving these locations in Appendix "A" to this memorandum. Photographs in Appendix "B" to this memorandum demonstrate a few of the more severe tree clearance problems I noted during my Mt. Carmel inspection on May 1, 2006.

I no longer believe that inadequate tree trimming is necessarily the biggest single risk to electric service reliability at Mt. Carmel Public Utility Company. I do believe, however, that the added emphasis Mt. Carmel has placed on tree trimming since its recovery program was initiated in January 2005 must be continued and, in some ways, improved further to prevent a return to the poor state of trimming I observed there in past years.

3. Conclusions

As of May 1, 2006, Mt. Carmel's tree trimming within the city of Mt. Carmel was very noticeably better than I have observed there in recent years. Several isolated locations within the city still have significant remaining tree conflicts, however, which Mt. Carmel needs to address. I no longer believe that inadequate tree trimming is necessarily the biggest single risk to electric service reliability at Mt. Carmel Public Utility Company.

In the past, Mt. Carmel has not had an organized, systematic approach to tree trimming. With considerable help from Staff, Mt. Carmel now has defined an organized, systematic plan to trim its trees on a 3-year trimming cycle. Overall, it has made the necessary tree trimming progress to be essentially where it should be at this time in its first 3-year cycle. It has not followed its quarterly plans very carefully from the outset, however, which will make it difficult to repeat the completed trimming pattern or to follow its defined plan through the next cycle without tree conflicts occurring in parts of its system. I believe Mt. Carmel still has considerable organizational work to do to achieve a repeatable tree trimming program without recurring tree conflicts in areas it did not trim when scheduled the prior time around.

4. Recommendations

- Mt. Carmel should address all of the remaining tree conflicts in the City of Mt. Carmel, which were either missed or inadequately trimmed when scheduled.

Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

- Mt. Carmel should continue to work on its organizational approach to its tree trimming program, with an emphasis on working and completing each quarterly grid when scheduled. This will be essential to its future success in following its defined program without having continually recurring tree conflicts in areas formerly trimmed off schedule.
- Mt. Carmel should follow its plan enabling it to meet its agreement with Staff "to assure that all of its electric circuits are in compliance with a three-year tree trimming cycle and are trimmed and maintained in accordance with National Electrical Safety Code (NESC) Rule 218 by July 1, 2007."
- Once achieved, Mt. Carmel Public Utility Company should continue to maintain a three-year tree trimming cycle that is in compliance with NESC Rule 218, assuring that all trees near its electric lines are trimmed such that there are no tree contacts with its energized primary conductors before it returns to trim them again.
- Staff should perform a comprehensive inspection of tree conditions throughout Mt. Carmel's service territory at the conclusion of the agreed tree trimming recovery period.

Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

APPENDIX "A"

Summary of Tree Conditions Field Inspection by ICC Staff			
Utility:	Mount Carmel Public Utility Co. (Mt. Carmel)	Date:	5/1/06
Circuits:	Random	Inspector:	J. D. Spencer, w/Larry Horrall (Mt. Carmel)
Gen. Notes: Tree trimming in the City of Mt. Carmel has very noticeably improved since the last inspection in 2004. Several scattered tree clearance problems remain throughout the city, however.			
Town	Item Description	Photo(s)	Location
<u>Mt. Carmel</u>			
	Tree close to 1-phase primary		West of Rt. 1 (Cherry St.) in easement N. of William Way Dr.
	Trees into spacer cable		College Dr. west of Park Rd. (2 locations)
	Trees close to 3-phase primary		Cherry St. north of Northwood Dr.
	Soft maple very close to 3-phase primary	109-0944	Cherry St. between 12th & 13th Sts.
	Soft maple into 3-phase primary (main feeder 1 block from 11th St. Substation)	945	11th St. west of Hillcrest Dr.
	Soft maple into 3-phase primary	946, 947	Pear St. north of 9th St.
	Soft maple into spacer cable		Poplar St. north of 12th St.
	Soft maple into spacer cable	951, 952	Ash St. south of 5th St.
	Trees close to primary		Daniel St. between 1st & 2nd Sts.
	Tree into 3-phase primary	949, 950	Bellmont St. south of 2nd St.
	Tree into spacer cable		In alley between 6th & 7th Sts., west of Mulberry St.
	Tree (Bradford pear?) into spacer cable	948	In alley north of 4th St., just east of Chestnut St.
	Trees close to 3-phase primary		Mulberry St. north of 2nd St
	Soft maple trees very close to 3-phase primary		Mulberry St. south of 1st St.
	Trees very close to 1-phase primary	942, 943	Wabash Ave. between Fairground Rd. & 4th St.

Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

APPENDIX "B"

Example Tree Problems at Mt. Carmel Public Utility Company, May 2006

Figure 1 (Photo 06-MtC944)

Soft maple tree very close to 3-phase primary, Cherry St. between 12th & 13th Sts.



Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

Figure 2 (Photo 06-MtC945)

Soft maple tree into 3-phase primary (main feeder 1 block from 11th St. Substation), 11th St. west of Hillcrest Dr.

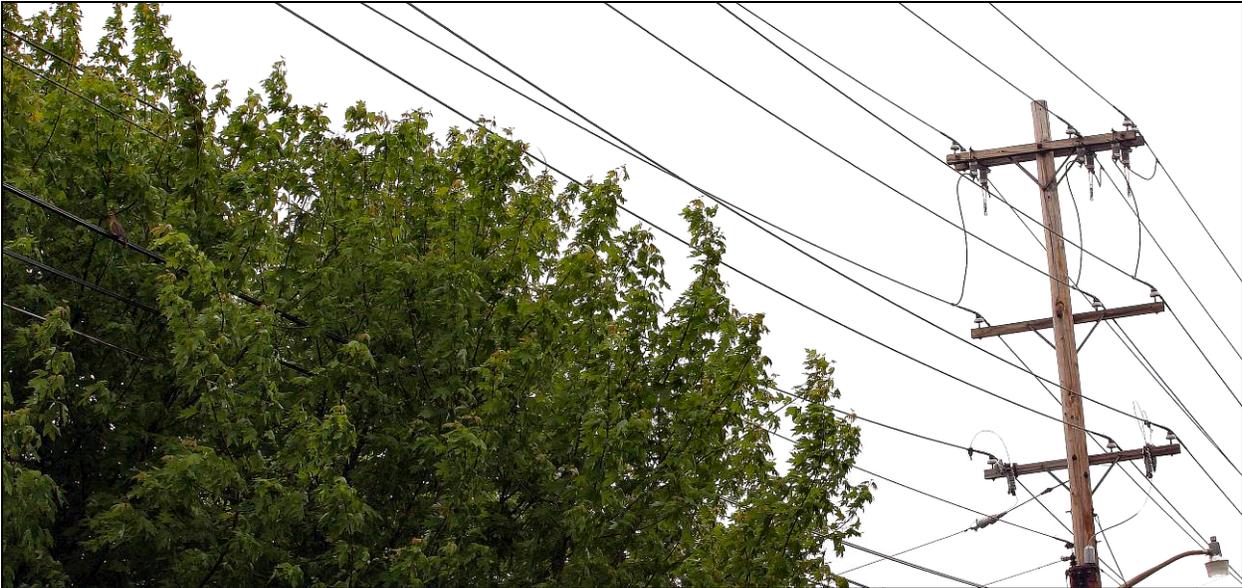


Figure 3 (Photo 06-MtC946)

Soft maple tree into 3-phase primary, Pear St. north of 9th St.



Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

Figure 4 (Photo 06-MtC948)
Tree (Bradford Pear?) into spacer cable, Alley north of 4th St., just east of Chestnut St.



Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

Figure 5 (Photo 06-MtC949)

Tree into 3-phase primary, Belmont St. south of 2nd St.



Attachment B: Report on the tree conditions in Mt. Carmel Public Utility's Service Territory

Figure 6 (Photo 06-MtC951)

Soft maple tree into spacer cable primary, Ash St. south of 5th St..

