



Shelby Energy Cooperative, Inc.

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March 30, 2009

Director of Engineering
Public Service Commission
P.O. Box 615
Frankfort, KY 40602-0615

RE: Administrative Case No. 2006-0494

Enclosed is the original and five (5) copies of the 2008 Distribution Reliability Report for Shelby Energy Cooperative as requested in the above order dated October 26, 2007.

Should you have any questions or need further information, please contact our office.

Sincerely,

A handwritten signature in cursive script, appearing to read "David Graham".

David Graham
IT & System Engineer

Enclosure



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2008 PSC Distribution Reliability Report

Administrative Case NO. 2006-00494

April 1, 2009

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 1: CONTACT INFORMATION

UTILITY NAME	1.1	<u>Shelby Energy Cooperative</u>
REPORT PREPARED BY	1.2	<u>Distribution System Solutions, Inc.</u>
E-MAIL ADDRESS OF PREPARER	1.3	<u>jtaylor.dss@fuse.net</u>
PHONE NUMBER OF PREPARER	1.4	<u>859-363-7983</u>

SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	2.1	<u>2008</u>
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SECTION 3: MAJOR EVENT DAYS

	T_{MED}	3.1	<u>7.03</u>
FIRST DATE USED TO DETERMINE T_{MED}		3.2	<u>1-Jan-06</u>
LAST DATE USED TO DETERMINE T_{MED}		3.3	<u>31-Dec-07</u>
NUMBER OF MED IN REPORT YEAR		3.4	<u>8</u>

NOTE: Per IEEE 1366 T_{MED} should be calculated using the daily SAIDI values for the five prior years. If five years of data are not available, then utilities should use what is available until five years are accumulated.

SECTION 4: SYSTEM RELIABILITY RESULTS

Excluding MED

SAIDI	4.1	<u>89.04</u>
SAIFI	4.2	<u>0.79</u>
CAIDI	4.3	<u>112.71</u>

Including MED (Optional)

SAIDI	4.4	<u>765.66</u>
SAIFI	4.5	<u>2.06</u>
CAIDI	4.6	<u>371.68</u>

Notes:

- 1) All duration indices (SAIDI, CAIDI) are to be reported in units of minutes.
 - 2) Reports are due on the first business day of April of each year
 - 3) Reports cover the calendar year ending in the December before the reports are due.
 - 4) IEEE 1366 (latest version) is used to define SAIDI, SAIFI, CAIDI, and T_{MED}
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KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 5: OUTAGE CAUSE CATEGORIES

Excluding MED

CAUSE CODE DESCRIPTION	SAIDI VALUE	CAUSE CODE DESCRIPTION	SAIFI VALUE
Scheduled 5.1.1	2.45	Scheduled 5.2.1	0.05
Major Storms 5.1.2	0	Major Storms 5.2.2	0
Equipm't or Installation 5.1.3	23.97	Equipm't or Installation 5.2.3	0.2
Age or Deterioration 5.1.4	0.6	Age or Deterioration 5.2.4	0.01
Weather 5.1.5	39.66	Weather 5.2.5	0.27
Birds or Animals 5.1.6	7.02	Birds or Animals 5.2.6	0.1
Public 5.1.7	6.95	Public 5.2.7	0.06
N/A 5.1.8	N/A	N/A 5.2.8	N/A
Unknown 5.1.9	8.46	Unknown 5.2.9	0.11
Power Supplier 5.1.10	0	Power Supplier 5.2.10	0

SECTION 6: WORST PERFORMING CIRCUITS

CIRCUIT IDENTIFIER	SAIDI VALUE	MAJOR OUTAGE CATEGORY
Sub 3 Feeder 1 6.1.1	597.46	30-Material/Equipment Fault
Sub 5 Feeder 4 6.1.2	456.51	54-Weather Related - Trees
Sub 5 Feeder 2 6.1.3	219.39	70-Vehicle or Machinery
Sub 9 Feeder 1 6.1.4	207.6	61-Large Animal
Sub 5 Feeder 3 6.1.5	183.29	54-Weather Related - Trees
Sub 4 Feeder 4 6.1.6	158.95	54-Weather Related - Trees
Sub 11 Feeder 3 6.1.7	156.72	30-Material/Equipment Fault
Sub 1 Feeder 3 6.1.8	122.46	53-Weather - Trees and Ice
Sub 7 Feeder 4 6.1.9	113.5	54-Weather Related - Trees
Sub 3 Feeder 2 6.1.10	110.09	99 Unknown

CIRCUIT IDENTIFIER	SAIFI VALUE	MAJOR OUTAGE CATEGORY
Sub 9 Feeder 1 6.2.1	6	61-Large Animal
Sub 3 Feeder 1 6.2.2	3.5	30-Material/Equipment Fault
Sub 5 Feeder 4 6.2.3	2.8	54-Weather Related - Trees
Sub 5 Feeder 2 6.2.4	2.22	70-Vehicle
Sub 5 Feeder 3 6.2.5	1.98	54-Weather Related - Trees
Sub 3 Feeder 2 6.2.6	1.56	99-Unknown
Sub 4 Feeder 4 6.2.7	1.22	54-Weather Related - Trees
Sub 1 Feeder 3 6.2.8	1.2	53-Weather Related - Trees and Ice
Sub 11 Feeder 3 6.2.9	0.98	30-Material/Equipment Fault
Sub 12 Feeder 3 6.2.10	0.9	30-Material/Equipment Fault

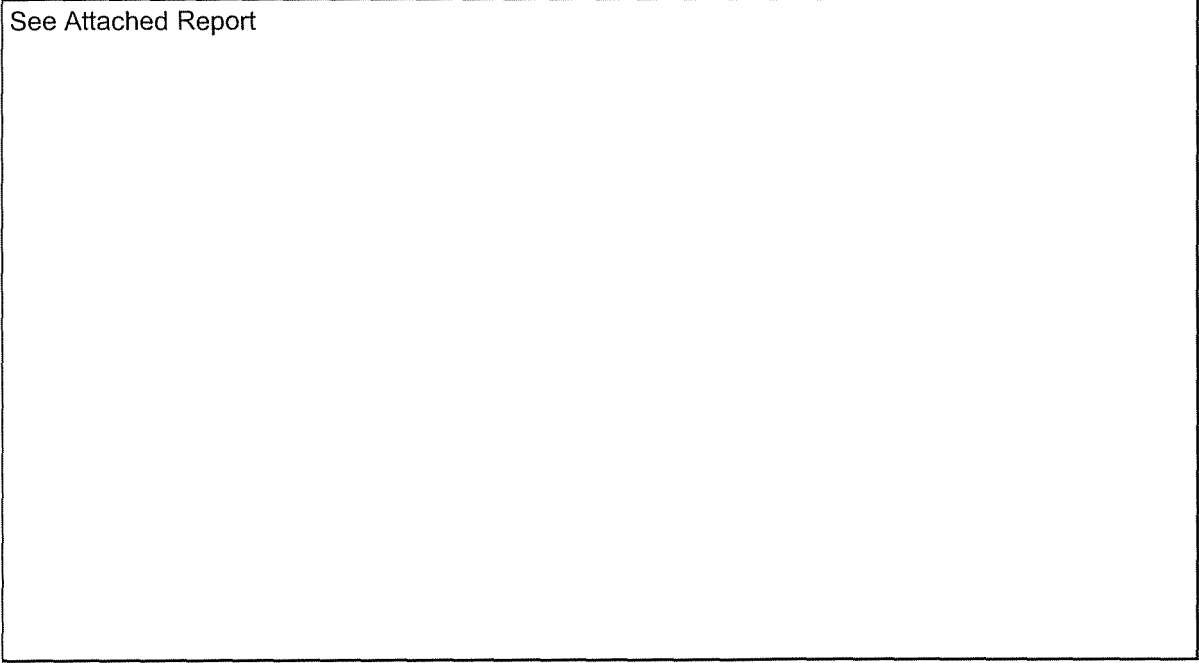
KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

Additional pages may be attached as necessary

SECTION 7: VEGETATION MANAGEMENT PLAN REVIEW

See Attached Report



SECTION 8: UTILITY COMMENTS

See Attached Report

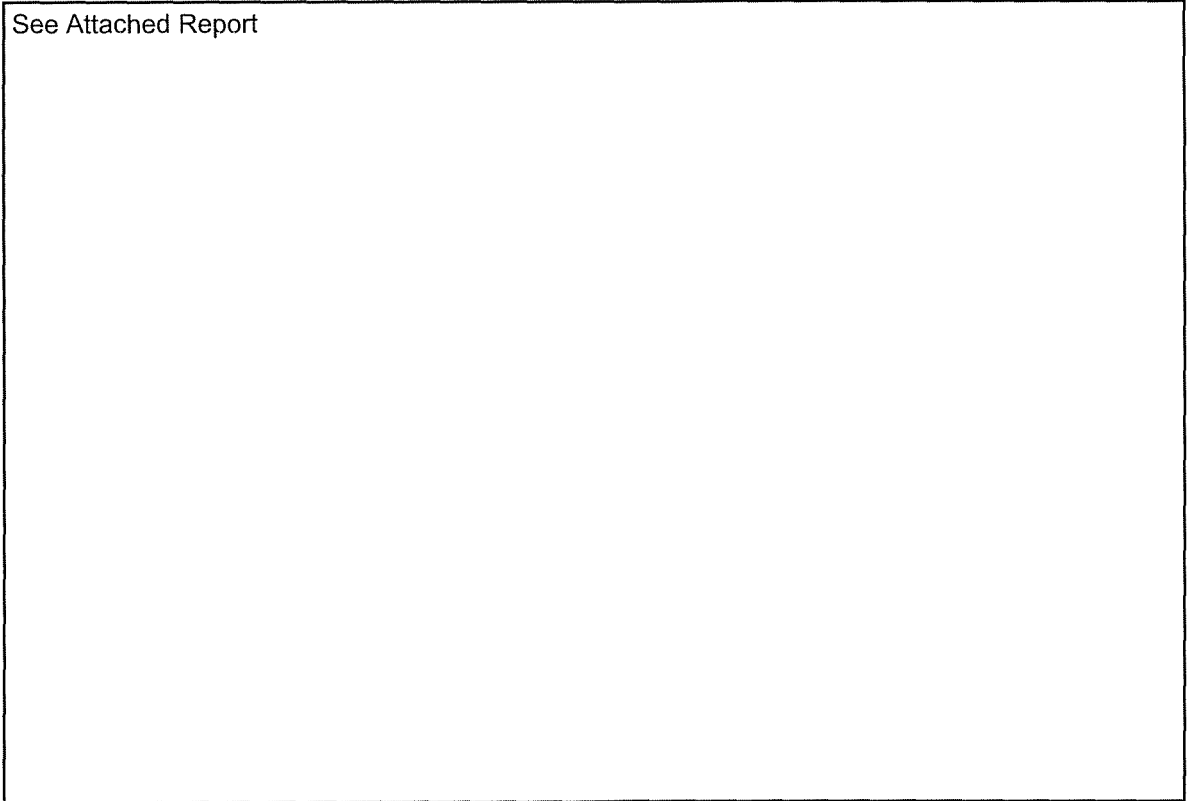


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I. Purpose of Report

This report is pursuant to the Public Service Commission's request for all electric distribution utilities to provide annual reports of reliability information as outlined in the findings from administrative case no. 2006-00494. This report documents the reliability performance of **Shelby Energy Cooperative** in Shelbyville, Kentucky for the 2008 calendar year.

Results in this report will be based on indices defined in IEEE standard 1366-2003, and will be reported on both system wide levels; as well as on the circuit level for the purpose of determining the ten worst performing circuits in the Shelby system. In this analysis major event days will NOT be included. Major Event Days will be identified based on the Beta Method described in the IEEE 1366 standard.

II. IEEE 1366 Definition of terms

The following terms are defined according to the IEEE standard 1366 and have been used in this report.

SAIFI = System Average Interruption Frequency Index calculated as

$$\text{SAIFI} = \frac{\text{Total number of customer interruptions}}{\text{Total number of customers served}}$$

SAIDI = System Average Interruption Duration Index given in minutes and hours per year calculated as

$$\text{SAIDI} = \frac{\text{Sum of all customer interruption durations}}{\text{Total number of customers served}}$$

CAIDI = Customer Average Interruption Duration Index

$$\text{CAIDI} = \frac{\text{SAIDI}}{\text{SAIFI}} = \frac{\text{Sum of all customer interruption durations}}{\text{Total number of customer interruptions}}$$

T_{MED} = Major event day identification threshold value calculated as

$$T_{\text{MED}} = e^{(\alpha + 2.5\beta)} \quad \text{where}$$

α = the average of the natural logarithms of each daily SAIDI value for the year

β = the standard deviation of the natural logarithms of the daily SAIDI values

III. Historical Data

Tables III.1 and III.2 show the reliability indices for the Shelby system for the past eight years. Table III.1 reflect all outages excluding outages caused by major storms. The Beta Method outlined in IEEE 1366 for identifying Major Event Days was not used when determining these indices. Table III.2 reflects outages where Major Event Days have been identified and omitted when determining the outage indices according to IEEE 1366.

Table III.1 Historical Indices

	SAIDI	SAIFI	CAIDI
2000	3.68	1.69	2.18
2001	2.32	1.27	1.83
2002	1.61	0.85	1.89
2003	1.30	0.76	1.71
2004	1.10	0.80	1.38
2005	1.09	0.53	2.08
2006	1.84	0.82	2.23

Table III.2 Historical Indices using IEEE 1366

	SAIDI	SAIDI	SAIFI	CAIDI	CAIDI
	in hrs	in mins		in hrs	in mins
2007	0.91	54.31	0.67	1.35	80.79

IV. 2008 System-wide Reliability Indices

All reliability indices for the Shelby system for 2008 were calculated with Major Event Days excluded. The Major Event Day Threshold (T_{MED}) was determined based on the SAIDI (in mins)/day values for 2006 and 2007 and equals **7.03 SAIDI/day**. The Major Event Days (days that exceeded T_{MED}) for 2008 are identified in Table IV.1. Monthly and year total reliability indices for 2008 are shown in Table IV.2.

Table IV.1 Major Event Days

Date	Related Cause	SAIDI /day (min)
2/6/2008	High Winds	69.27
2/12/2008	Ice	44.00
5/11/2008	Substation Out	22.59
7/3/2008	Transmission	15.70
7/20/2008	Weather and trees down	16.28
9/14/2008	Hurricane Ike	256.37
9/15/2008	Hurricane Ike	241.60
9/16/2008	Hurricane Ike	10.81

Table IV.2 2008 Reliability Indices
2008 Outages excluding Major Event Days
By Month

Months Totals	SAIFI	SAIDI	CAIDI
JANUARY	0.08	10.70	129.78
FEBRUARY	0.08	9.50	114.05
MARCH	0.07	5.60	76.43
APRIL	0.02	2.16	115.17
MAY	0.05	5.55	112.61
JUNE	0.08	8.43	99.94
JULY	0.06	7.27	118.58
AUGUST	0.05	6.83	146.79
SEPTEMBER	0.16	16.99	103.07
OCTOBER	0.03	2.76	106.96
NOVEMBER	0.04	3.69	95.98
DECEMBER	0.06	9.56	161.73
YEARLY TOTAL	0.79	89.04	mins 112.71
		1.48	hours 1.88

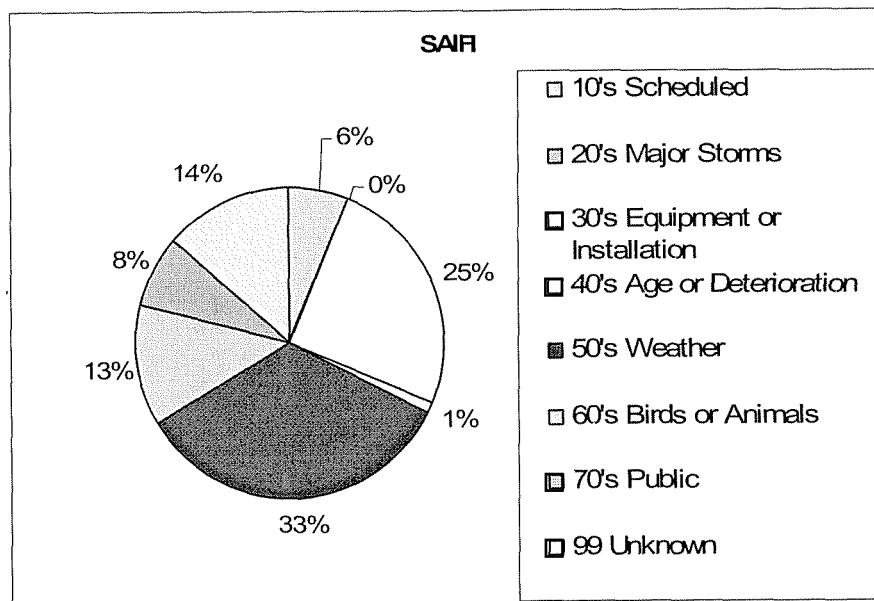
V. Outage Causes

Shelby tracks the causes of outages to the best of their ability. There are 9 main groups of cause categories. Table V.1 shows the reliability indices for each cause category group. Charts V.1 – V.3 show the percent contribution of each cause category to the overall system reliability indices.

Table V.1 Outages by Cause Codes

Cause Code	Description	No. Of Consumers	Consumer Hours	SAIFI	SAIDI	CAIDI
10's	Scheduled	714	620.86	0.05	2.45	49.00
20's	Major Storms	0	0.00	0.00	0.00	0.00
30's	Equipment or Installation	3095	6068.11	0.20	23.97	119.85
40's	Age or Deterioration	84	152.77	0.01	0.60	60.00
50's	Weather	4087	10040.54	0.27	39.66	146.89
60's	Birds or Animals	1462	1776.16	0.10	7.02	70.20
70's	Public	849	1760.47	0.06	6.95	115.83
99	Unknown	1674	2141.16	0.11	8.46	76.91
00	Power Supplier	0	0.00	0.00	0.00	0.00
TOTAL		11965	22560.07	0.80	89.11 mins	111.39
					1.49 hours	1.86

Chart V.1 SAIFI by Cause Code



V. Outage Causes - continued

Chart V.2 SAIDI by Cause Code

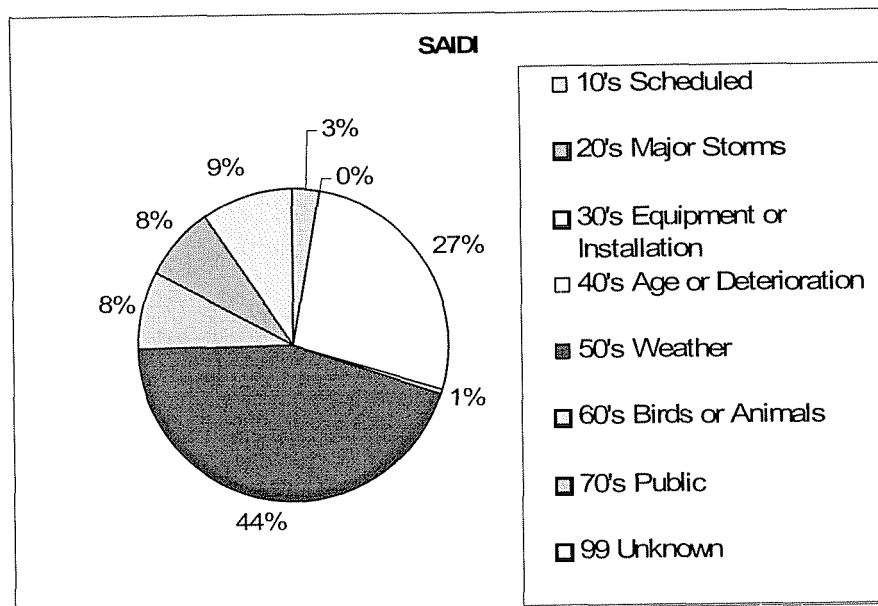
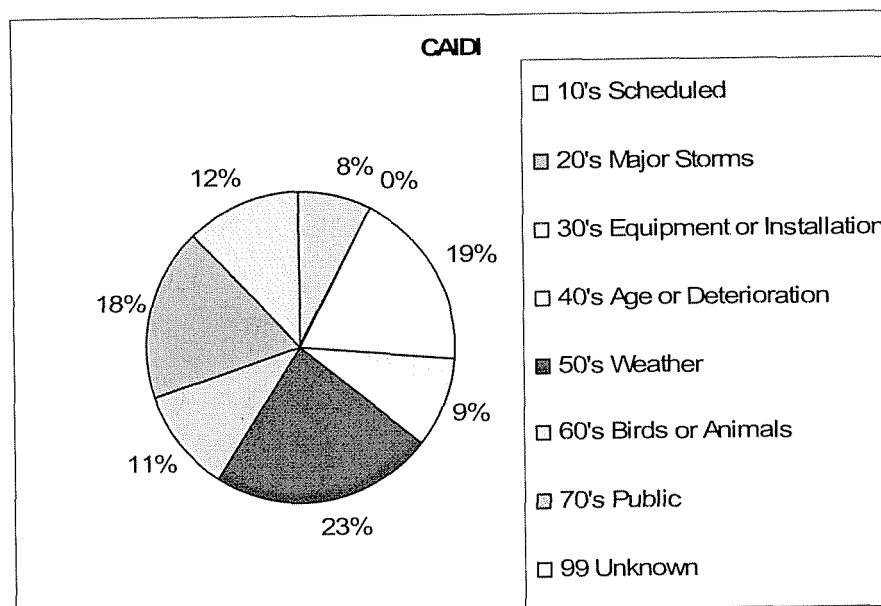


Chart V.3 CAIDI by Cause Code



VI. Ten Worst Circuits

The reliability indices were calculated for each feeder for 2008, and the ten worst performing feeders for SAIFI and SAIDI were identified. Each feeder was analyzed as its own “system” in that only the consumers served on a given feeder were used in the calculation of the index for that feeder. Tables VI-1 through VI-2 on the following pages show the results of the feeder analysis for each index listed from worst to best in reliability.

Weather events were the main cause affecting the reliability of Shelby Energy’s distribution system. Shelby Energy strives to design, maintain, and operate its distribution system to minimize outage times and affected members due to adverse weather conditions.

Wildlife in substations was another major contributing factor to Shelby’s “ten worst” list. We have and will continue to work with our power supplier, East Kentucky Power Cooperative to target problematic locations and implement wild life guards and insulated cover up materials on substation equipment jumpers and connections where electrical clearances are close.

Finally, circuits where poor performance can be attributed solely to material/equipment faults will be evaluated for replacement and/or up-grade projects in Shelby’s next construction work plan process.

Table VI.1 Circuits with 10 worst SAIFI indices highlighted

Reliability Rankings from Greatest to Least By SAIFI

Substation	Feeder	No. Of Consumers Out	Consumer Hours	No. Of Consumers on Feeder	SAIFI	Major cause
9	1	6	3.46	1	6.00	Animal Related
3	1	1146	3256.15	327	3.50	Material/Equipment Failure
5	4	859	2335.83	307	2.80	Weather Related - trees
5	2	860	1415.07	387	2.22	Vehicle
5	3	1174	1814.60	594	1.98	Weather Related - trees
3	2	855	1007.30	549	1.56	Unknown
4	4	288	625.19	236	1.22	Weather Related - trees
1	3	751	1281.78	628	1.20	Weather Related - ice on trees
11	3	254	673.90	258	0.98	Material/Equipment Failure
12	3	9	9.27	10	0.90	Material/Equipment Failure
2	3	913	1221.31	1015	0.90	
11	1	617	832.20	703	0.88	
7	2	590	1099.54	675	0.87	
10	1	805	700.78	933	0.86	
2	1	231	360.95	375	0.62	
3	3	289	304.76	487	0.59	
2	4	129	362.00	232	0.56	
7	4	220	777.49	411	0.54	
4	2	314	761.20	624	0.50	
4	1	326	878.19	653	0.50	
5	1	299	1029.15	606	0.49	
13	2	203	343.05	454	0.45	
7	3	79	143.42	226	0.35	
12	2	1	1.08	3	0.33	
2	2	113	456.37	408	0.28	
1	2	40	50.25	146	0.27	
1	4	101	215.10	384	0.26	
12	1	1	4.08	4	0.25	
7	1	21	27.53	91	0.23	
11	2	118	119.39	546	0.22	
13	1	69	53.95	325	0.21	
4	3	80	116.78	483	0.17	
6	1	141	212.08	1216	0.12	
6	3	30	31.86	445	0.07	
2	5	15	12.36	281	0.05	
6	2	9	12.12	207	0.04	
9	2	0	0.00	6	0.00	

Table VI.2 Circuits with 10 worst SAIDI indices highlighted

**Reliability Rankings from Greatest to Least
By SAIDI**

Substation	Feeder	No. Of Consumers Out	Consumer Hours	No. Of Consumers on Feeder	SAIDI in mins	SAIDI in hours	Major cause
3	1	1146	3256.15	327	597.46	9.96	Material/Equipment Failure
5	4	859	2335.83	307	456.51	7.61	Weather Related - trees
5	2	860	1415.07	387	219.39	3.66	Vehicle
9	1	6	3.46	1	207.60	3.46	Animal Related
5	3	1174	1814.60	594	183.29	3.05	Weather Related - trees
4	4	288	625.19	236	158.95	2.65	Weather Related - trees
11	3	254	673.90	258	156.72	2.61	Material/Equipment Failure
1	3	751	1281.78	628	122.46	2.04	Weather Related - ice on trees
7	4	220	777.49	411	113.50	1.89	Weather Related - trees
3	2	855	1007.30	549	110.09	1.83	Unknown
5	1	299	1029.15	606	101.90	1.70	
7	2	590	1099.54	675	97.74	1.63	
2	4	129	362.00	232	93.62	1.56	
4	1	326	878.19	653	80.69	1.34	
4	2	314	761.20	624	73.19	1.22	
2	3	913	1221.31	1015	72.20	1.20	
11	1	617	832.20	703	71.03	1.18	
2	2	113	456.37	408	67.11	1.12	
12	1	1	4.08	4	61.20	1.02	
2	1	231	360.95	375	57.75	0.96	
12	3	9	9.27	10	55.62	0.93	
13	2	203	343.05	454	45.34	0.76	
10	1	805	700.78	933	45.07	0.75	
7	3	79	143.42	226	38.08	0.63	
3	3	289	304.76	487	37.55	0.63	
1	4	101	215.10	384	33.61	0.56	
12	2	1	1.08	3	21.60	0.36	
7	1	21	27.53	91	18.15	0.30	
1	2	40	50.25	146	15.16	0.25	
4	3	80	116.78	483	14.51	0.24	
11	2	118	119.39	546	13.12	0.22	
6	1	141	212.08	1216	10.46	0.17	
13	1	69	53.95	325	9.96	0.17	
6	3	30	31.86	445	4.30	0.07	
6	2	9	12.12	207	3.51	0.06	
2	5	15	12.36	281	2.64	0.04	
9	2	0	0.00	6	0.00	0.00	

APPENDIX A

Vegetation Management Plan

MEMORANDUM

Date: March 24, 2009

To: Mr. Jim Welch
Director of Engineering
Public Service Commission

From: David Martin
Manager of Operations

RE: Admin. Case No. 2006-0494 - Annual Review of Vegetation Management Plan

Even with the major weather events in February and September of 2008, Shelby Energy Cooperative (Shelby) was successful in accomplishing the majority of goals established in the vegetation management plan as submitted to the Public Service Commission in December, 2007.

Unfortunately, several contractor hours were focused on restoration during those two months rather than working on routinely scheduled right of way clearing during that time. Shelby stated in the plan that a total of 402 miles of right of way were scheduled for clearing in 2008.

At the end of 2008, Shelby had cleared 350 miles of right of way. Extra effort will be put forth to incorporate the remaining 52 planned miles for 2008 into the right of way clearing for the year of 2009.

Changes for the following year will include more aggressive monitoring of overall right of way clearing with special attention to cross-country areas. Cleared right of way will be inspected to verify that a proper method of providing access to Shelby Energy's plant is provided by windrowing foliage when trimmed. These two issues came to light during the restoration of service throughout the year.

We have attached an updated copy of the Vegetation Management Plan with current data for the number of meters and miles of line.

SHELBY ENERGY COOPERATIVE
620 Old Finchville Road
Shelbyville, KY

VEGETATION MANAGEMENT PLAN

Vegetation management plays an integral role in accomplishing a significant portion of the mission statement for Shelby Energy Cooperative (Shelby Energy): *Safety and Reliability; Quality Service; Competitive Rates; Community Development; Lasting Value*. By maintaining effective vegetation control, Shelby Energy is able to provide a safer environment for the public by reducing possible contact with power lines, safer conditions for employees and contractors to perform daily work of construction or maintenance by sustaining clearance from electric lines, and preserving or improving service reliability and quality by preventing contact between vegetation and service lines that ultimately result in power outages.

Shelby Energy is an electric distribution system serving ten (10) counties: Shelby, Henry, Trimble, Carroll, Owen, Oldham, Jefferson, Franklin, Spencer, and Anderson. The system consists of approximately 15,283 meters and 2,078 miles of overhead and underground primary conductor. Shelby Energy members are served by eleven (11) substations that are owned and operated by East Kentucky Power Cooperative located in Winchester, KY. An attachment showing the service territory and substations for Shelby Energy is included (Exhibit 1).

ROW CLEARING CYCLE

Shelby Energy uses a clearing cycle of five (5) years that combines right-of-way trimming, right-of-way spraying and mowing to complete the five-year rotation. A total of three (3) contract trimming crews are utilized by Shelby Energy with no less than two (2) crews working year around as weather permits. One (1) spraying crew is used several months during the summer season. On average, 416 miles of line are cleared of vegetation by trimming crews and 48-50 miles of line are sprayed annually. Shelby Energy complies with the RUS Right-of-Way Clearing Guide - M1.30G and a copy is attached (Exhibit 2).

RELIABILITY CRITERIA AND REPORTS

Operations and engineering employees of Shelby Energy monitor daily, monthly, and annual outage reports and service requests initiated by employees, contractors and cooperative members. This information is reviewed to determine if trends exist indicating a deterioration of service quality or reliability within any service area. In addition, Shelby Energy utilizes the services of a consulting professional engineer to review outage data and assist in resolving service quality or reliability issues.

PERFORMANCE OF MAINTENANCE

Shelby Energy evaluates the service territory trimmed and sprayed based on the right-of-way clearing cycle established and adjusts scheduled clearing as needed to manage the right-of-way cycle and maintain a high standard of service quality and reliability. Any trouble area receives immediate attention to resolve associated outage or service issues as discovered during the evaluation. In addition, construction and engineering personnel, service crews, and contract crews report, during routine work performance and patrolling throughout the year, any specific location that requires vegetation cleared immediately.

PLAN EVALUATION

Shelby Energy regularly monitors outages to determine the cause. These findings are compared monthly, annually, and over a five (5) year period to determine if trends showing a decline in service quality or reliability are developing within an area of the cooperative's system. Employees of Shelby Energy's engineering department work with a consulting professional engineer to calculate, review, and evaluate SAIFI, SAIDI, and CAIDI. The professional engineer, operations, and engineering personnel of Shelby Energy continuously verify that any issues with trouble service areas are resolved in a timely manner that best benefits the members of the cooperative.