Shelby Energy Cooperative

Your Touchstone Energy® Partner

March 30, 2010

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PUBLIC SERVICE COMMISSION

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 2009 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,

David Graham

David Graham
IT & System Engineer

Enclosure

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 1: CONTACT INFORMATION

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

SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	2.1	2009

SECTION 3: MAJOR EVENT DAYS

T_{MED}	3.1	9.42
FIRST DATE USED TO DETERMINE T_{MED}	3.2	1-Jan-06
LAST DATE USED TO DETERMINE T_{MED}	3.3	31-Dec-08
NUMBER OF MED IN REPORT YEAR	3.4	10

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	111.59
SAIFI	4.2	0.85
CAIDI	4.3	131.28

Including MED (Optional)

SAIDI	4.4	3688.33
SAIFI	4.5	2.58
CAIDI	4.6	1429.59

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}

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	3.6	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	26.38	Equipm't or Installation	5.2.3	0.24
Age or Deterioration	5.1.4	1.65	Age or Deterioration	5.2.4	0.02
Weather	5.1.5	67.07	Weather	5.2.5	0.37
Birds or Animals	5.1.6	3.05	Birds or Animals	5.2.6	0.05
Public	5.1.7	2.88	Public	5.2.7	0.01
N/A	5.1.8	N/A	N/A	5.2.8	N/A
Unknown	5.1.9	6.92	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	672.99	51-Weather
Sub 11 Feeder 3	6.1.2	397.92	53-Weather
Sub 5 Feeder 2	6.1.3	367.12	50-Weather
Sub 13 Feeder 2	6.1.4	349.21	50-Weather
Sub 5 Feeder 1	6.1.5	256.59	54-Weather
Sub 2 Feeder 3	6.1.6	161.21	30-Material/Equipment Fault
Sub 10 Feeder 1	6.1.7	159.15	50-Weather
Sub 4 Feeder 1	6.1.8	135.3	10-Scheduled
Sub 6 Feeder 2	6.1.9	123.53	30-Material/Equipment Fault
Sub 6 Feeder 3	6.1.10	114.45	51-Weather

CIRCUIT IDENTIFIER		SAIFI VALUE	MAJOR OUTAGE CATEGORY
Sub 3 Feeder 1	6.2.1	5.22	51-Weather
Sub 13 Feeder 2	6.2.2	2.55	50-Weather
Sub 10 Feeder 1	6.2.3	2.07	50-Weather
Sub 5 Feeder 1	6.2.4	1.92	54-Weather Related
Sub 6 Feeder 2	6.2.5	1.57	30-Material/Equipment Fault
Sub 3 Feeder 2	6.2.6	1.34	73-Vandalism
Sub 2 Feeder 3	6.2.7	1.16	30-Material/Equipment Fault
Sub 5 Feeder 2	6.2.8	1.14	50-Weather
Sub 4 Feeder 2	6.2.9	1.13	30-Material/Equipment Fault
Sub 4 Feeder 1	6.2.10	1.06	10-Scheduled

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

2009 PSC Distribution Reliability Report

In regards to Administrative Case NO. 2006-00494

April 1, 2010

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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 2009 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

$T_{MED} = e^{(\alpha + 2.5\beta)}$ 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 nine 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 in hrs	SAIDI in mins	SAIFI	CAIDI in hrs	CAIDI in mins
2007	0.91	54.31	0.67	1.35	80.79
2008	1.48	89.04	0.79	1.88	112.71

IV. 2009 System-wide Reliability Indices

All reliability indices for the Shelby system for 2009 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, 2007, and 2008 and equals **9.42** SAIDI/day. The Major Event Days (days that exceeded T_{MED}) for 2009 are identified in Table IV.1. Monthly and year total reliability indices for 2009 are shown in Table IV.2.

Table IV.1 Major Event Days

Date	Related Cause	SAIDI /day (min)
1/27/2009	Ice Storm	186.1
1/28/2009	Ice Storm	2,147.7
1/29/2009	Ice Storm	595.4
1/30/2009	Ice Storm	394.4
1/31/2009	Ice Storm	52.0
2/1/2009	Ice Storm	79.4
2/11/2009	Wind & Ice	55.4
6/1/2009	Transmission Line	20.8
7/25/09	Storm	30.2
10/9/2009	Storm	10.5

Table IV.2 2009 Reliability Indices

2009 Outages excluding Major Event Days
By Month

Months Totals	SAIFI	SAIDI		CAIDI
JANUARY	0.03	5.92		175.59
FEBRUARY	0.07	22.47		321.93
MARCH	0.05	4.48		86.03
APRIL	0.13	13.82		109.52
MAY	0.11	11.13		103.01
JUNE	0.09	10.26		120.45
JULY	0.04	5.66		139.43
AUGUST	0.07	10.85		151.81
SEPTEMBER	0.08	9.13		120.76
OCTOBER	0.06	4.11		71.82
NOVEMBER	0.01	1.06		76.78
DECEMBER	0.12	12.70		109.89
YEARLY TOTAL	**0.85**	**111.59**	**mins**	**131.28**
		1.86	**hours**	**2.19**

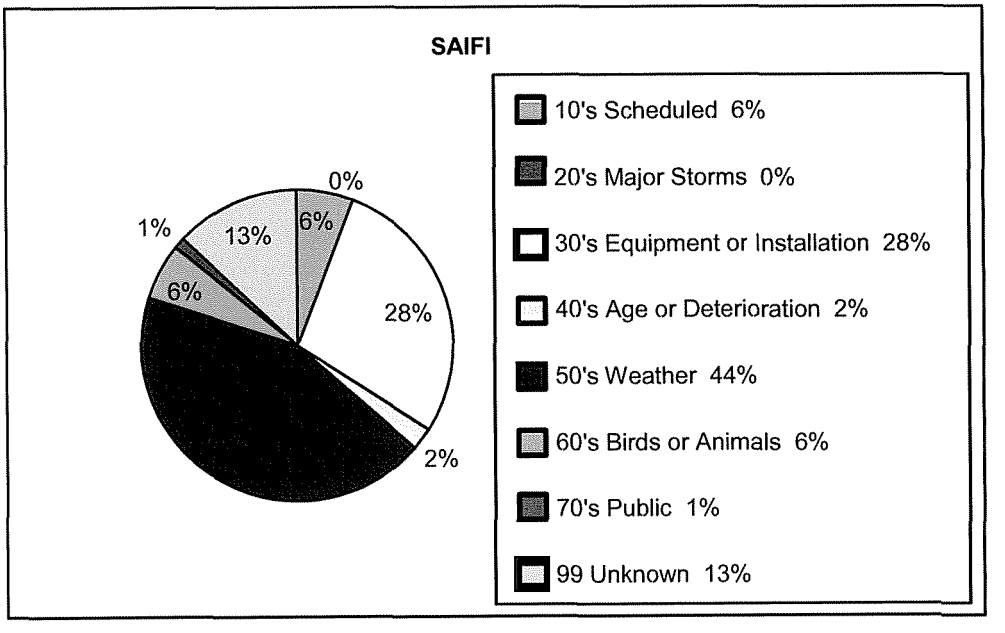
V. Outage Causes

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	828	917.71	0.05	3.60		72.00
20's	Major Storms	0	0.00	0.00	0.00		0.00
30's	Equipment or Installation	3659	6721.99	0.24	26.38		109.92
40's	Age or Deterioration	230	420.17	0.02	1.65		82.50
50's	Weather	5697	17093.35	0.37	67.07		181.27
60's	Birds or Animals	711	777.42	0.05	3.05		61.00
70's	Public	180	734.89	0.01	2.88		288.00
99	Unknown	1680	1763.95	0.11	6.92		62.91
00	Power Supplier	0	0.00	0.00	0.00		0.00
TOTAL		**12985**	**28429.48**	**0.85**	**111.55**	**mins**	**131.24**
					1.86	**hours**	**2.19**

Chart V.1 SAIFI by Cause Code



V. Outage Causes - continued

Chart V.2 SAIDI by Cause Code

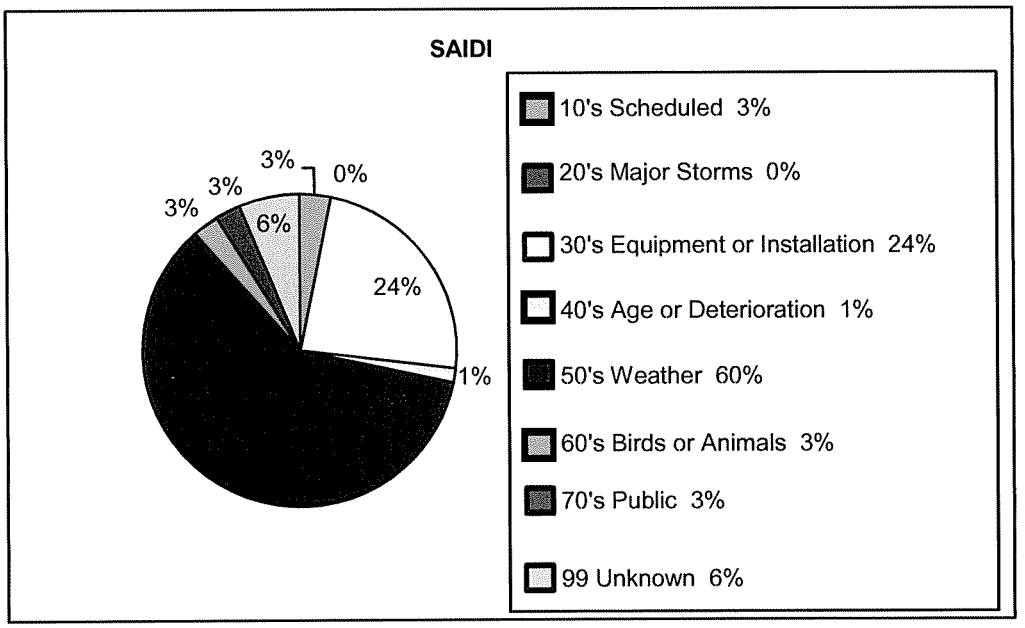
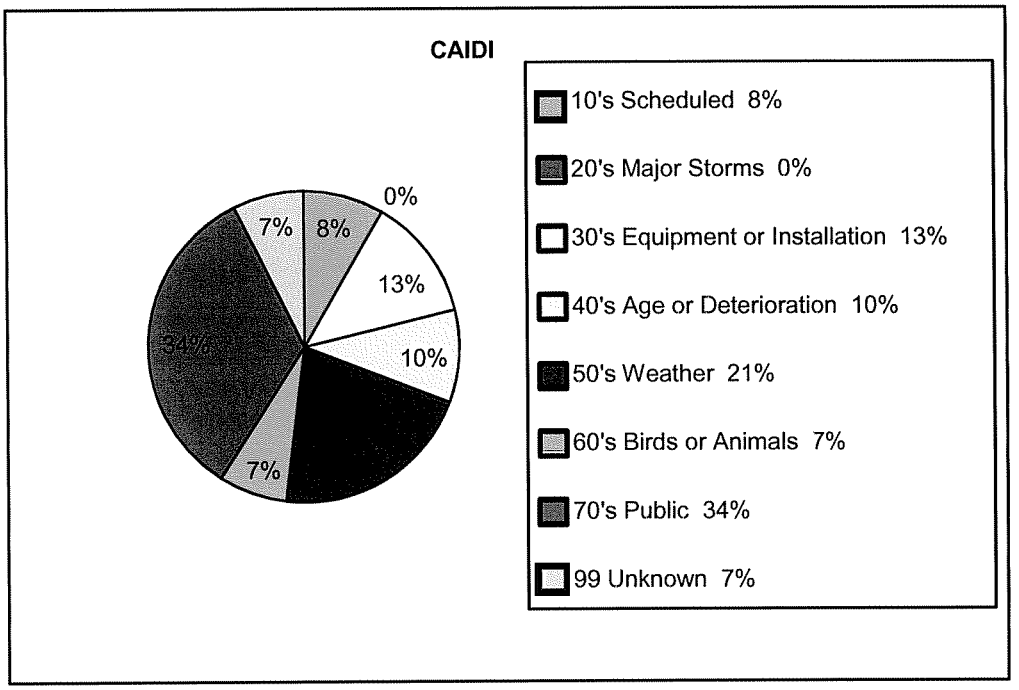


Chart V.3 CAIDI by Cause Code



VI. Ten Worst Circuits

The reliability indices were calculated for each feeder for 2009, 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. The remnants of the ice storm in late January and early February contributed to the "ten worst performing feeders". Also there were several days of storms with lightning and high winds. Fallen trees, mainly large trees outside of the right-of-way, caused significant damage throughout Shelby Energy's territory.

Circuits where poor performance can be attributed to material/equipment faults will be evaluated for replacement and/or up-grade. An example is Substation # 3 Feeder (circuit) #1 has been problematic and was re-built in the summer of 2009. Since the re-build, this circuit has shown significant improvement in reliability.

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
3	1	1692	3634.16	324	5.22	Weather
13	2	1156	2636.56	453	2.55	Weather
10	1	1802	2313.04	872	2.07	Weather
5	1	1183	2634.36	616	1.92	Weather
6	2	331	434.41	211	1.57	Weather
3	2	746	1052.48	555	1.34	Vandalism
2	3	1176	2719.14	1012	1.16	Equipment
5	2	434	2331.23	381	1.14	Weather
4	2	711	585.95	631	1.13	Equipment
4	1	694	1477.05	655	1.06	Scheduled
BG Tie		128	128.00	150	0.85	
1	2	122	232.95	152	0.80	
6	3	282	875.53	459	0.61	
1	4	229	321.26	389	0.59	
5	4	169	495.44	318	0.53	
7	3	104	208.26	227	0.46	
2	1	169	397.00	378	0.45	
5	3	260	1149.87	623	0.42	
11	3	132	2327.86	351	0.38	
11	1	239	265.72	707	0.34	
2	4	75	329.45	235	0.32	
7	4	128	360.45	433	0.30	
2	2	115	199.84	410	0.28	
11	2	142	167.72	542	0.26	
7	2	167	205.97	675	0.25	
6	1	289	453.33	1211	0.24	
3	3	100	138.25	488	0.20	
1	3	122	197.12	630	0.19	
9	2	1	2.75	6	0.17	
2	5	29	41.35	285	0.10	
4	3	43	73.42	480	0.09	
4	4	13	19.16	240	0.05	
13	1	2	20.40	343	0.01	
7	1	0	0.00	91	0.00	
8	1	0	0.00	1	0.00	
9	1	0	0.00	1	0.00	
12	1	0	0.00	0	0.00	
12	2	0	0.00	5	0.00	
12	3	0	0.00	12	0.00	
14	1	0	0.00	4	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	1692	3634.16	324	672.99	11.22	Weather
11	3	132	2327.86	351	397.92	6.63	Weather
5	2	434	2331.23	381	367.12	6.12	Weather
13	2	1156	2636.56	453	349.21	5.82	Weather
5	1	1183	2634.36	616	256.59	4.28	Weather
2	3	1176	2719.14	1012	161.21	2.69	Equipment
10	1	1802	2313.04	872	159.15	2.65	Weather
4	1	694	1477.05	655	135.30	2.26	Scheduled
6	2	331	434.41	211	123.53	2.06	Weather
6	3	282	875.53	459	114.45	1.91	Weather
3	2	746	1052.48	555	113.78	1.90	
5	3	260	1149.87	623	110.74	1.85	
5	4	169	495.44	318	93.48	1.56	
1	2	122	232.95	152	91.95	1.53	
2	4	75	329.45	235	84.11	1.40	
2	1	169	397.00	378	63.02	1.05	
4	2	711	585.95	631	55.72	0.93	
7	3	104	208.26	227	55.05	0.92	
BG Tie		128	128.00	150	51.20	0.85	
7	4	128	360.45	433	49.95	0.83	
1	4	229	321.26	389	49.55	0.83	
2	2	115	199.84	410	29.24	0.49	
9	2	1	2.75	6	27.50	0.46	
11	1	239	265.72	707	22.55	0.38	
6	1	289	453.33	1211	22.46	0.37	
1	3	122	197.12	630	18.77	0.31	
11	2	142	167.72	542	18.57	0.31	
7	2	167	205.97	675	18.31	0.31	
3	3	100	138.25	488	17.00	0.28	
4	3	43	73.42	480	9.18	0.15	
2	5	29	41.35	285	8.71	0.15	
4	4	13	19.16	240	4.79	0.08	
13	1	2	20.40	343	3.57	0.06	
7	1	0	0.00	91	0.00	0.00	
8	1	0	0.00	1	0.00	0.00	
9	1	0	0.00	1	0.00	0.00	
12	1	0	0.00	0	0.00	0.00	
12	2	0	0.00	5	0.00	0.00	
12	3	0	0.00	12	0.00	0.00	
14	1	0	0.00	4	0.00	0.00	

APPENDIX A

MEMORANDUM

Date: March 24, 2010

To: Mr. Reggie Chaney
Director of Engineering
Public Service Commission

From: Keith Miller
Field Supervisor

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

January and February 2009 proved to be a test of the right-of-way practices and the overall integrity of the Shelby Energy Cooperative (Shelby) system. Even with the left over effects of the Ice Storm, Shelby was successful in accomplishing the majority of goals established in the Vegetation Management Plan (VMP) as submitted to the Public Service Commission in March of 2009.

During the first two months of the year, many of the contractor hours were focused on removal of broken and damaged trees rather than working on the planned right-of-way (ROW) clearing.

ROW changes for 2011 are included in the VMP. Cleared ROW will continue being inspected to verify that proper methods of cutting and removal are being maintained. This proper method of removal is directly related to the restoration of outages.

Attached is an updated copy of Shelby's VMP with up-to-date information pertaining to the number of meters / consumers and miles of line.

Sincerely,

Keith Miller
Field Supervisor
Shelby Energy Cooperative, Inc.

SHELBY ENERGY COOPERATIVE
620 Old Finchville Road
Shelbyville, KY

VEGETATION MANAGEMENT PLAN (VMP)

Shelby Energy Cooperative is an electric distribution system serving tèn (10) counties in north-central Kentucky: Shelby, Henry, Trimble, Carroll, Owen, Oldham, Jefferson, Franklin, Spencer, and Anderson. The system consists of approximately 15,293 meters / consumers and 2,088 miles of overhead and underground primary conductor. Shelby members are served by eleven (11) substations that are owned and operated by East Kentucky Power Cooperative with headquarters in Winchester, KY. An attachment showing the service territory and substations for Shelby is included (Exhibit 1).

Vegetation management (VM) plays an integral role in accomplishing a significant portion of the mission statement for Shelby Energy Cooperative (Shelby):

"Shelby Energy Cooperative will provide safe, reliable and cost-effective energy service, while preserving our environment. Our mission is to educate members, employees, and the public with knowledge and tools to use energy safely and efficiently to enhance their quality of life."

Maintaining effective VM is a major factor in promoting a safer environment within Shelby's certified territory. VM reduces the possibility of accidental contact with energized power lines thus providing safer conditions for the public, for employees and for contractors. Reliability and power quality enhancements are also afforded by proper VM.

RIGHT OF WAY (ROW) CLEARING CYCLE

Shelby uses a clearing cycle of four (4) years that combines ROW trimming, spraying and mowing. A total of three (3) contract trimming crews (crews) are utilized by Shelby 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, 500 miles of line are cleared of vegetation by trimming crews and 50 miles of line are sprayed annually. Shelby increased its ROW clearing crews from three (3) to four (4) in 2009. This additional crew is equipped with a "sky track" machine and a bush hog unit. This new crew and equipment enables Shelby to cover more rough terrain and clear ROW issues in many cross country locations.

Shelby is currently looking into a "Trade-a-Tree" program to allow for a more aggressive approach at ensuring Zone 1 "Reliability Areas" not only have cleared ROW but that off-ROW "Danger Trees" are addressed. Shelby complies with the RUS ROW Clearing Guide ~ M1.30G (Exhibit 2).

RELIABILITY CRITERIA AND REPORTS

Operations and engineering (O&E) employees of Shelby 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 specific area. In addition, Shelby utilizes the services of a professional engineering consultant to review outage data and assist in resolving service quality or reliability issues.

PERFORMANCE OF MAINTENANCE

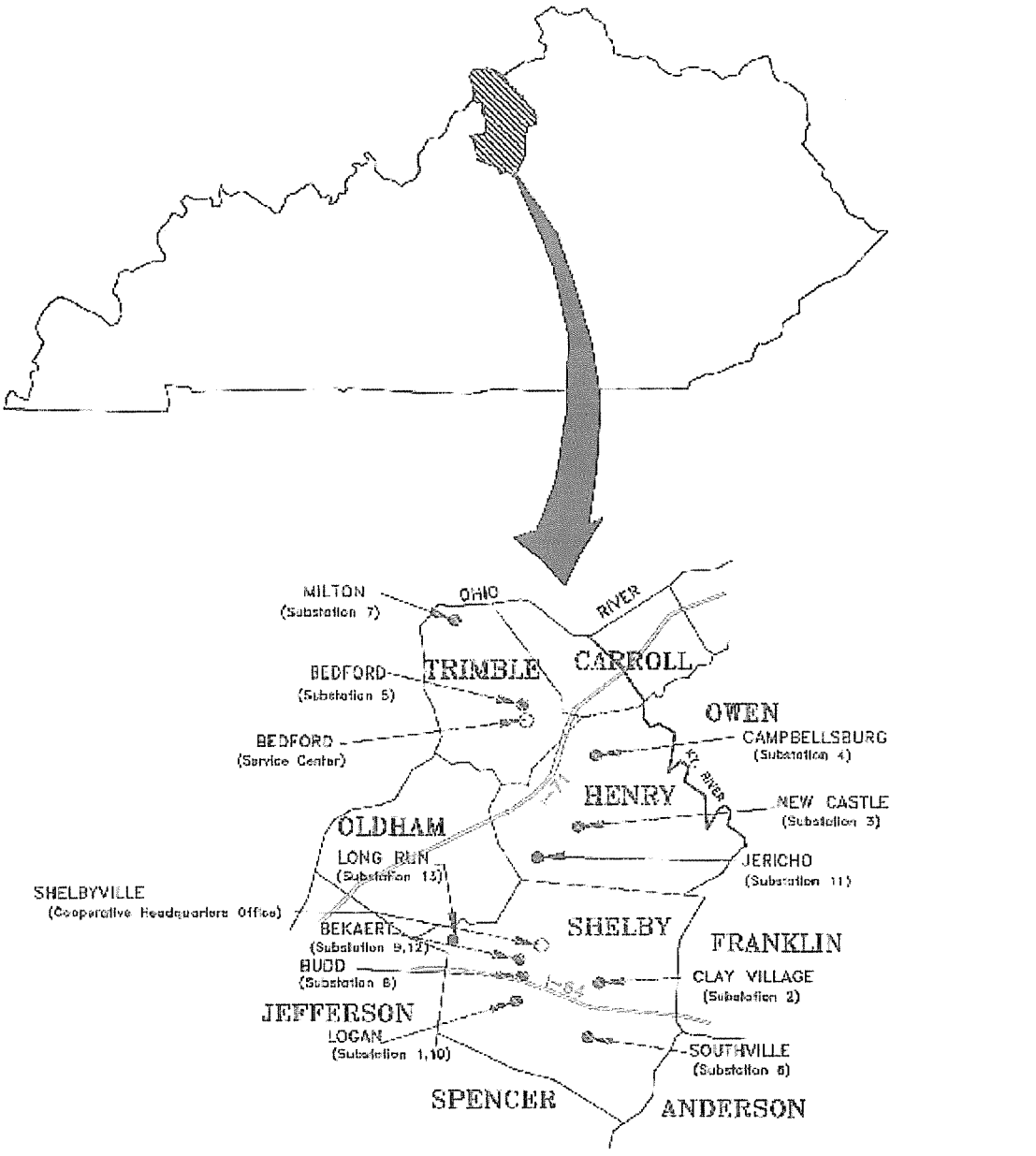
The ROW clearing cycle is established and adjusted as needed to manage the ROW cycle and maintain a high standard of service, quality and reliability. Trouble areas receive timely attention to resolve associated outage or service issues as discovered. Shelby E&O personnel and contractors report problems during their routine work and patrolling efforts to define locations requiring attention to ROW issues. These issues are handled on a case-by-case basis depending upon their severity.

PLAN EVALUATION

Shelby regularly monitors outages to determine their underlying cause(s). These findings are reviewed monthly, annually, and over a rolling five (5) year period to determine if trending indicates a decline in service quality or reliability is developing within an area of the cooperative's system. Employees of Shelby's E&O department work with a professional engineering consultant to calculate, review, and evaluate standard reliability

indices of SAIFI, SAIDI, and CAIDI. Shelby's E&O personnel and it's professional engineering consultant continuously monitor and verify that reliability issues are resolved in such a manner that best benefits the members of the cooperative.

Exhibit # 1



SHELBY ENERGY COOPERATIVE SERVICE AREA

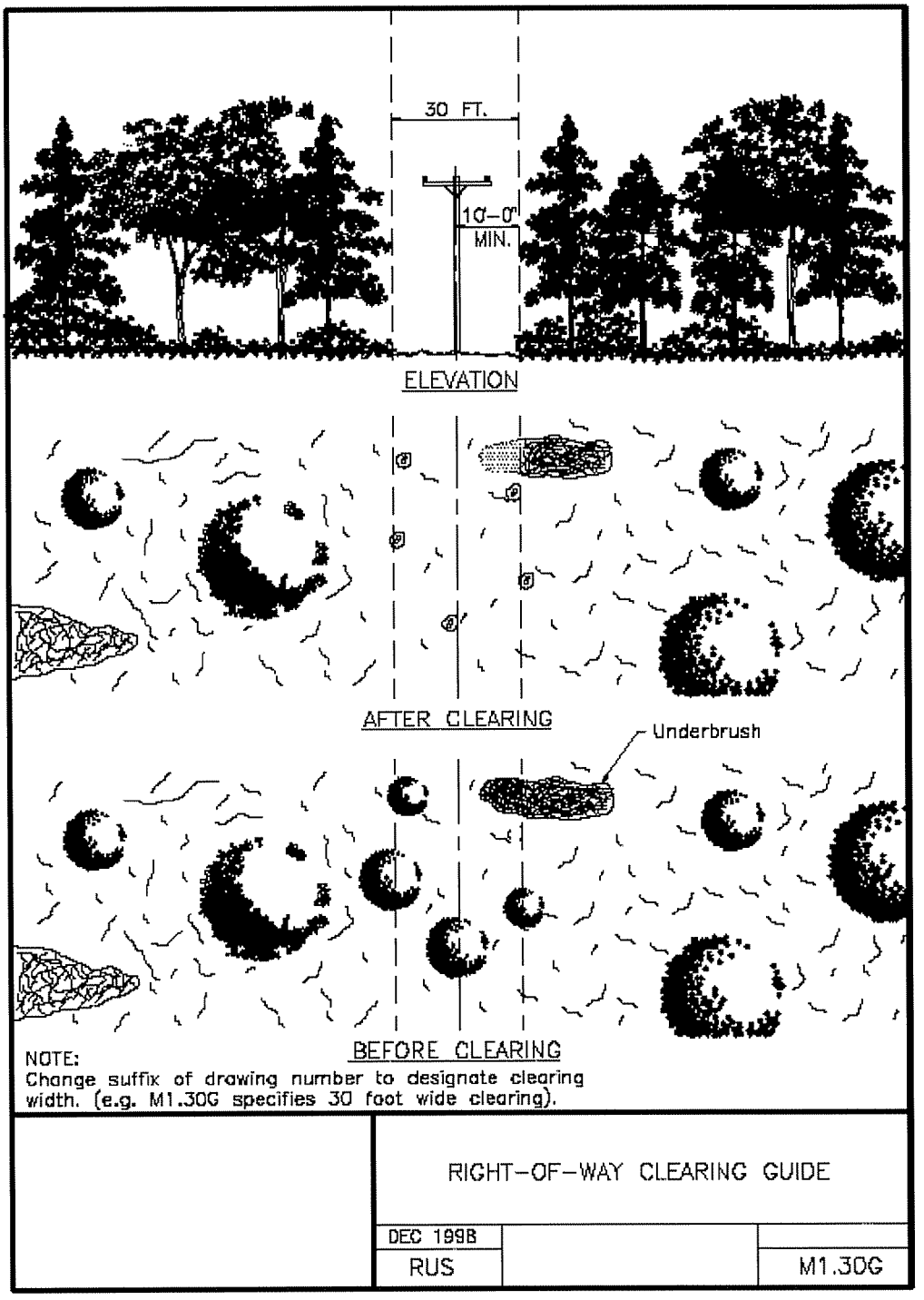
Exhibit # 2

RIGHT-OF-WAY CLEARING SPECIFICATIONS

The right-of-way shall be prepared by removing trees, clearing underbrush, and trimming trees so that the right-of-way is cleared close to the ground and to the width specified. However, low growing shrubs, which will not interfere with the operation or maintenance of the line, shall be left undisturbed if so directed by the owner. Slash may be chipped and blown on the right-of-way if so specified.

The landowner's written permission shall be received prior to cutting trees outside of the right-of-way. Trees fronting each side of the right-of-way shall be trimmed symmetrically unless otherwise specified. Dead trees beyond the right-of-way which would strike the line in falling shall be removed. Leaning trees beyond the right-of-way which would strike the line in falling and which would require topping if not removed, shall either be removed or topped, except that shade, fruit, or ornamental trees shall be trimmed and not removed, unless otherwise authorized.

Exhibit #2


30 FT.
10'-0"
MIN.
ELEVATION
AFTER CLEARING
Underbrush
BEFORE CLEARING
NOTE:
Change suffix of drawing number to designate clearing width. (e.g. M1.30G specifies 30 foot wide clearing).
RIGHT-OF-WAY CLEARING GUIDE
DEC 1998
RUS
M1.30G