Shelby Energy
Cooperative, Inc.
Your Touchstone Energy® Partner

March 25, 2008

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

RE: Administrative Case No. 2006-0494

Dear Mr. Welch:

Enclosed is an original and five (5) copies of the 2007 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,

Debbie Martin
President & CEO

Enclosure

Shelby Energy Cooperative

Your Touchstone Energy® Partner

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PUBLIC SERVICE COMMISSION

2007 PSC Distribution Reliability Report

In regards to Administrative Case NO. 2006-00494

April 1, 2008

Table of Contents

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 2007 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 1366-2003 standard.

II. IEEE 1366 Definition of terms

The following terms are defined according to the IEEE standard 1366-2003 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

Table III.1 shows the reliability indices for the Shelby system for the past seven years. These indices 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.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

IV. 2007 System-wide Reliability Indices

All reliability indices for the Shelby system for 2007 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 equals **8.7** SAIDI/day. The Major Event Days (days that exceeded T_{MED}) for 2007 are identified in Table IV.1. Monthly and year total reliability indices for 2007 are shown in Table IV.2.

Table IV.1 Major Event Days

Date	Related Cause	SAIDI /day (min)
1/21/2007	Transmission	9.3
3/25/2007	Transmission	82.1
3/28/2007	Substation outage	12.3
11/8/2007	Substation outage	8.8

Table IV.2 2007 Reliability Indices

2007 Indices excluding Major Event Days

By Month

Monthly Totals	SAIFI	SAIDI		CAIDI
JANUARY	0.04	3.80		103.90
FEBRUARY	0.04	3.62		84.59
MARCH	0.17	2.11		12.50
APRIL	0.02	2.57		143.14
MAY	0.07	3.15		47.99
JUNE	0.07	9.74		131.12
JULY	0.05	5.31		112.69
AUGUST	0.04	7.73		185.19
SEPTEMBER	0.02	1.53		74.68
OCTOBER	0.13	10.82		83.28
NOVEMBER	0.01	1.70		125.78
DECEMBER	0.01	2.23		167.35
YEARLY TOTAL	**0.67**	**54.31**	**mins**	**80.79**
		0.91	**hours**	**1.35**

V. Outage Causes

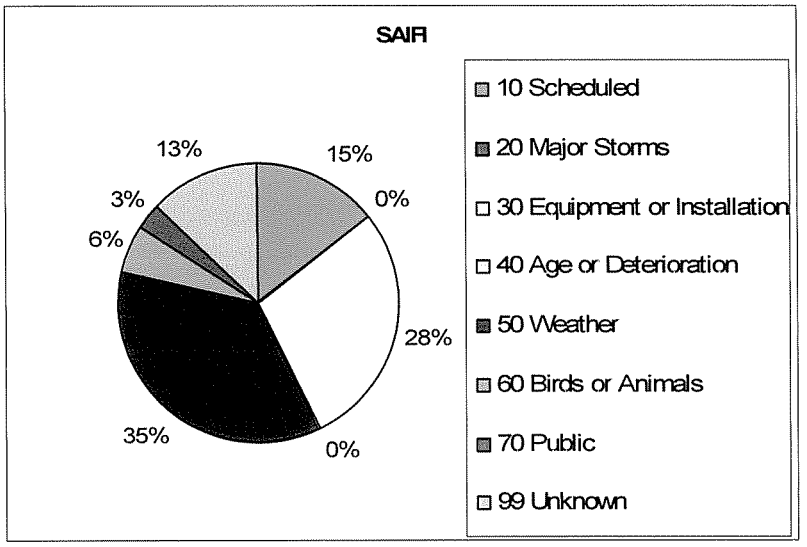
Shelby tracks the causes of outages to the best of their ability. There are 9 main groups of cause categories. Table V.1 shows the reliability indices for each cause category group. Charts V.1 – V.3 show the percent contribution of each cause category to the overall system reliability indices.

Table V.1 Outages by Cause Codes

2007 Outages excluding Major Event Days By Cause Codes

Cause Code	Description	No. Of Consumers	Consumer Hours	SAIFI	SAIDI		CAIDI
10's	Scheduled	1145	655.84	0.08	2.63		34.37
20's	Major Storms	0	0.00	0.00	0.00		0.00
30's	Equipment or Installation	2227	3899.47	0.15	15.61		105.06
40's	Age or Deterioration	7	12.00	0.00	0.05		102.86
50's	Weather	2799	7108.90	0.19	28.45		152.39
60's	Birds or Animals	441	503.59	0.03	2.02		68.52
70's	Public	235	546.07	0.02	2.19		139.42
99	Unknown	1013	855.69	0.07	3.43		50.68
00	Power Supplier	0	0.00	0.00	0.00		0.00
TOTAL		**7867**	**13581.56**	**0.52**	**54.36**	**mins**	**103.58**
					0.91	**hours**	**1.73**

Chart V.1 SAIFI by Cause Code



V. Outage Causes - continued

Chart V.2 SAIDI by Cause Code

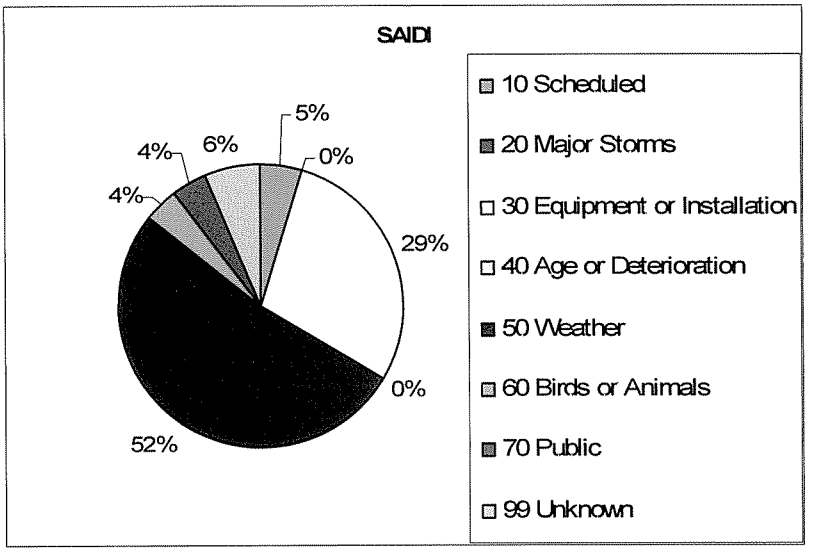
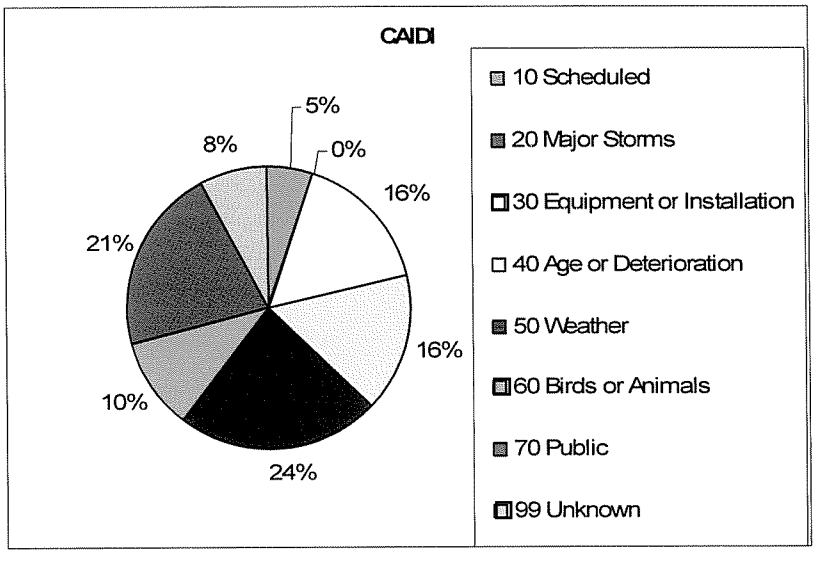


Chart V.3 CAIDI by Cause Code



VI. Ten Worst Circuits

The reliability indices were calculated for each feeder for 2007, and the ten worst performing feeders for each index 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-3 on the following pages show the results of the feeder analysis for each index listed from worst to best in reliability.

Further analysis of the "ten worst performing feeders" reveals that 93% of the consumer-hours by frequency (SAIFI) can be attributed to weather events. This includes the consumer-hours of two out of the three feeders which experienced outages caused by material/equipment faults. Nearly every one of these events can be attributed to lightning and ultimately to a failure of the arrester itself. Shelby Energy has diligently deployed lightning arrester protection across its entire distribution system as recommended by the Rural Utilities Services guide of four (4) arresters per mile. Additionally, lightning arresters are installed at all line equipment locations and critical junction points. This approach clearly offers a high degree of system protection from lightning and as a result, a higher degree of overall reliability. The "down-side" to this is when an arrester failure occurs it is usually catastrophic in nature, resulting in the sectionalizing of the affected circuit. Repair and service restoration efforts are generally prolonged because they are performed typically under adverse conditions.

Wild life in substations was another 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. In particular, this will include: Sub 3 (New Castle), Feeder 1 and Sub 4 (Campbellsburg) Feeder 1.

It is interesting to note of the ten worst performing feeders, that trees/vegetation were a minor contributing factor, which is a testament to Shelby's successful ongoing vegetation management plan.

Table VI.1 Circuits with 10 worst SAIFI indices highlighted

Reliability Rankings from Greatest to Least By SAIFI

Substation	Feeder	No. Of Consumers on Feeder	No. Of Consumers Out	Consumer Hours	SAIFI	Major Cause
10	1	917	2123	2251.67	2.32	Material / equipment faults
11	2	542	1027	712.71	1.89	Planned outage and some weather related
1	2	137	222	526.10	1.62	Weather Related - lightning
5	4	303	373	573.59	1.23	Equipment failure
9	1	1	1	4.50	1.00	Animal took substation out
1	4	373	299	423.85	0.80	Public related
12	2	3	2	1.66	0.67	Weather Related - lightning
3	1	326	212	639.05	0.65	Equipment faults and weather
2	2	367	215	388.08	0.59	Weather Related - trees and animals
3	3	478	262	430.09	0.55	Weather related - wind and trees
2	4	231	126	211.05	0.55	
7	3	223	118	312.84	0.53	
4	4	236	113	245.19	0.48	
5	1	601	280	725.36	0.47	
13	2	440	203	367.49	0.46	
2	1	383	176	487.77	0.46	
4	1	651	294	1852.77	0.45	
7	2	666	277	505.04	0.42	
2	3	1040	411	748.17	0.40	
9	2	6	2	19.67	0.33	
7	4	417	113	234.77	0.27	
3	2	539	121	215.41	0.22	
5	2	366	82	183.65	0.22	
6	3	441	88	236.94	0.20	
6	1	1201	218	296.92	0.18	
4	3	476	81	71.00	0.17	
7	1	91	15	26.25	0.16	
4	2	623	95	243.53	0.15	
5	3	586	81	315.17	0.14	
6	2	205	28	52.38	0.14	
11	1	690	86	96.01	0.12	
1	3	619	63	96.24	0.10	
11	3	250	23	33.57	0.09	
13	1	303	26	31.95	0.09	
2	5	271	13	17.74	0.05	

Table VI.2 Circuits with 10 worst SAIDI indices highlighted

Reliability Rankings from Greatest to Least By SAIDI

Substation	Feeder	No. Of Consumers on Feeder	No. Of Consumers Out	Consumer Hours	SAIDI in mins	SAIDI in hrs	Major Cause
9	1	1	1	4.50	270.00	4.50	Animal took substation out.
1	2	137	222	526.10	230.41	3.84	Weather Related - lightning
9	2	6	2	19.67	196.70	3.28	Animal took substation out
4	1	651	294	1852.77	170.76	2.85	Material fault, loose clamp caused phase fault
10	1	917	2123	2251.67	147.33	2.46	Material / equipment faults
3	1	326	212	639.05	117.62	1.96	Multiple causes: equipment faults and weather
5	4	303	373	573.59	113.58	1.89	Equipment failure
7	3	223	118	312.84	84.17	1.40	Weather Related - lightning
11	2	542	1027	712.71	78.90	1.31	Planned outage and some weather related
2	1	383	176	487.77	76.41	1.27	Weather Related - ice and other
5	1	601	280	725.36	72.42	1.21	
1	4	373	299	423.85	68.18	1.14	
2	2	367	215	388.08	63.45	1.06	
4	4	236	113	245.19	62.34	1.04	
2	4	231	126	211.05	54.82	0.91	
3	3	478	262	430.09	53.99	0.90	
13	2	440	203	367.49	50.11	0.84	
7	2	666	277	505.04	45.50	0.76	
2	3	1040	411	748.17	43.16	0.72	
7	4	417	113	234.77	33.78	0.56	
12	2	3	2	1.66	33.20	0.55	
5	3	586	81	315.17	32.27	0.54	
6	3	441	88	236.94	32.24	0.54	
5	2	366	82	183.65	30.11	0.50	
3	2	539	121	215.41	23.98	0.40	
4	2	623	95	243.53	23.45	0.39	
7	1	91	15	26.25	17.31	0.29	
6	2	205	28	52.38	15.33	0.26	
6	1	1201	218	296.92	14.83	0.25	
1	3	619	63	96.24	9.33	0.16	
4	3	476	81	71.00	8.95	0.15	
11	1	690	86	96.01	8.35	0.14	
11	3	250	23	33.57	8.06	0.13	
13	1	303	26	31.95	6.33	0.11	
2	5	271	13	17.74	3.93	0.07	

Table VI.3 Circuits with 10 worst CAIDI indices highlighted

Reliability Rankings from Greatest to Least By CAIDI

Substation	Feeder	No. Of Consumers on Feeder	No. Of Consumers Out	Consumer Hours	CAIDI	Major Cause
9	2	6	2	19.67	9.84	Animal took substation out
4	1	651	294	1852.77	6.30	Material fault, loose clamp caused phase fault
9	1	1	1	4.50	4.50	Animal took substation out.
5	3	586	81	315.17	3.89	Weather related - lightning
3	1	326	212	639.05	3.01	Equipment faults and weather
2	1	383	176	487.77	2.77	Weather Related - ice and other
6	3	441	88	236.94	2.69	Weather related - lightning
7	3	223	118	312.84	2.65	Weather related - lightning
5	1	601	280	725.36	2.59	Equipment faults and weather
4	2	623	95	243.53	2.56	Weather - trees
1	2	137	222	526.10	2.37	
5	2	366	82	183.65	2.24	
4	4	236	113	245.19	2.17	
7	4	417	113	234.77	2.08	
6	2	205	28	52.38	1.87	
7	2	666	277	505.04	1.82	
2	3	1040	411	748.17	1.82	
13	2	440	203	367.49	1.81	
2	2	367	215	388.08	1.81	
3	2	539	121	215.41	1.78	
7	1	91	15	26.25	1.75	
2	4	231	126	211.05	1.68	
3	3	478	262	430.09	1.64	
5	4	303	373	573.59	1.54	
1	3	619	63	96.24	1.53	
11	3	250	23	33.57	1.46	
1	4	373	299	423.85	1.42	
2	5	271	13	17.74	1.36	
6	1	1201	218	296.92	1.36	
13	1	303	26	31.95	1.23	
11	1	690	86	96.01	1.12	
10	1	917	2123	2251.67	1.06	
4	3	476	81	71.00	0.88	
12	2	3	2	1.66	0.83	
11	2	542	1027	712.71	0.69	

VII. Vegetation Management Plan Implementation / Changes

In implementing the vegetation management plan at Shelby Energy, two of three crews are assigned individual feeders from a substation that is scheduled to be cut on the rotation program. Progress is visually inspected and any additional trimming found during inspection is corrected. This progress is marked and dated monthly on a system map. The right-of-way completed is measured to insure the vegetation management plan schedule is maintained. The schedule is periodically reviewed to determine if additional crews are needed to assist with maintaining the schedule.

The third crew is assigned to right-of-way to be cleared for new work orders and used to cut or trim any immediate needs that are reported by cooperative personnel of Shelby Energy or by members.

There are no scheduled changes to the trimming and cutting practices of Shelby Energy for this year. The spraying budget has been increased by $12,000.00 for 2008. The spraying of right-of-way has proven to be an affective method to assist with the maintenance of right-of-way clearing.

APPENDIX A

Vegetation Management Plan

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 15,100 meters and 2,022 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 and right-of-way spraying 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, 360 miles of line are cleared of vegetation by trimming crews and 42 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.

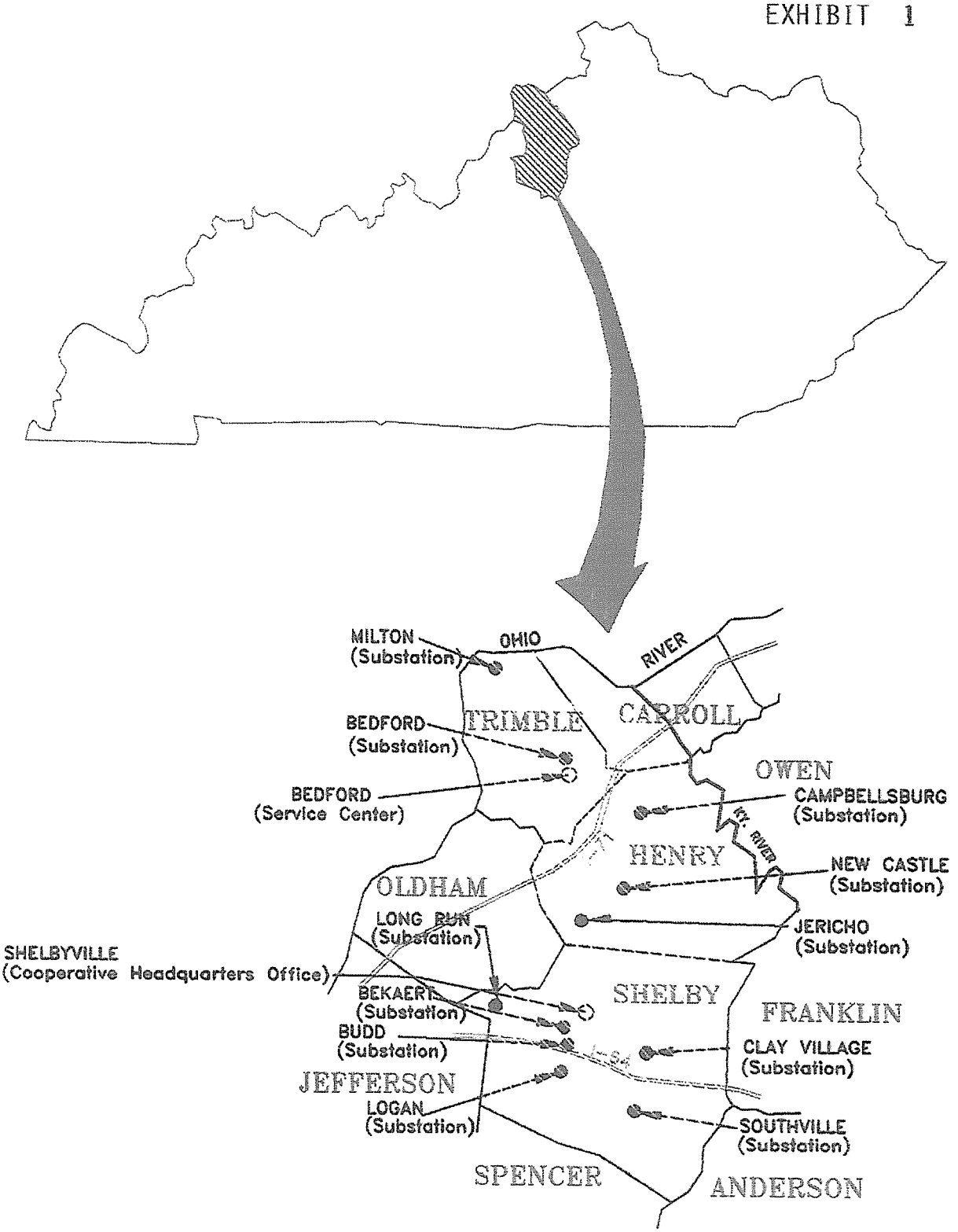
PERFORMANCE OF MAINTENANCE

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

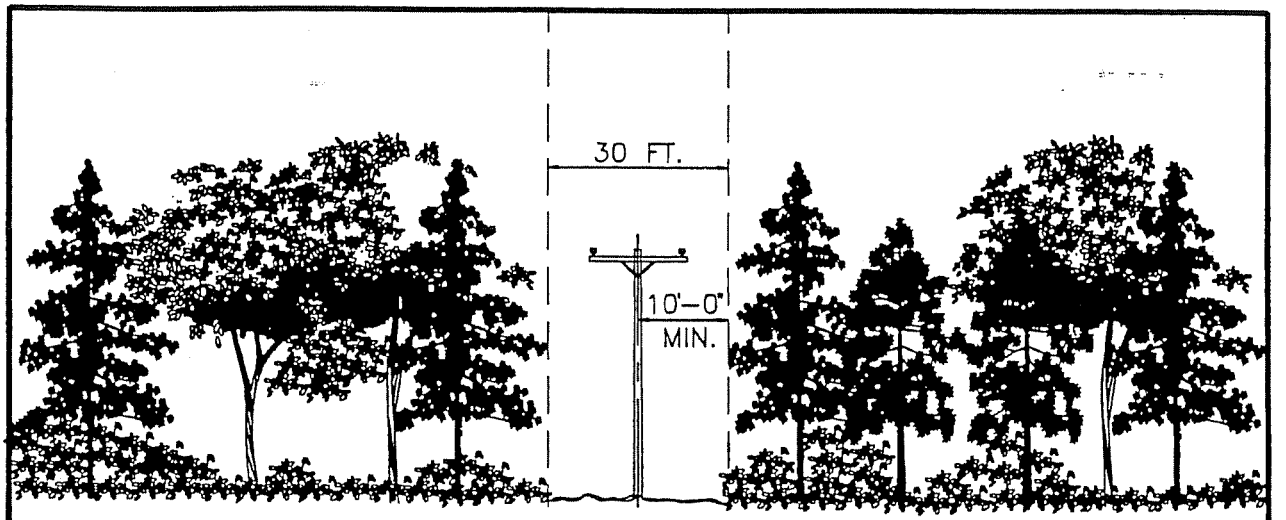
Shelby Energy regularly monitors outages to determine the cause. These findings are compared monthly, annually, and over a five (5) year period to determine if trends showing a decline in service quality or reliability are developing within an area of the cooperative's system. Employees of Shelby Energy's 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.

EXHIBIT 1

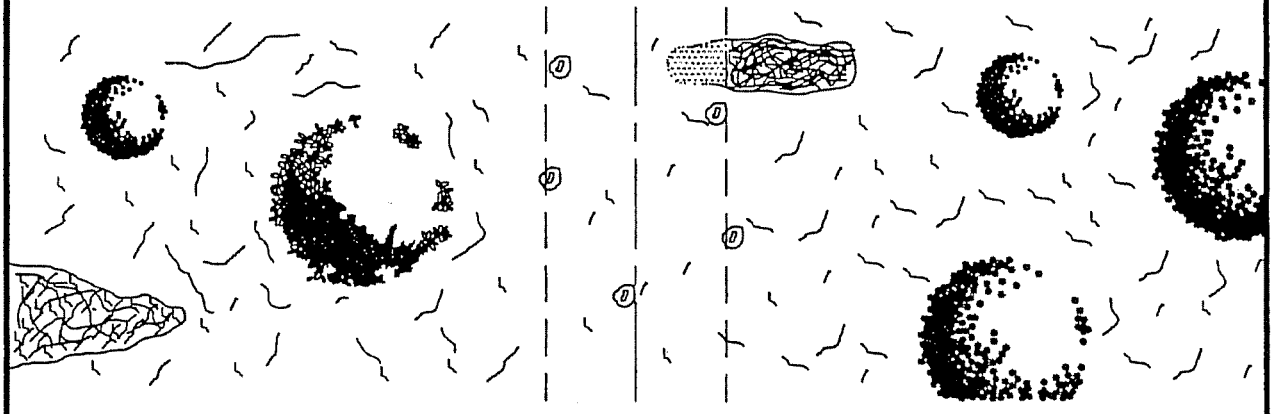


SHELBY ENERGY COOPERATIVE SERVICE AREA

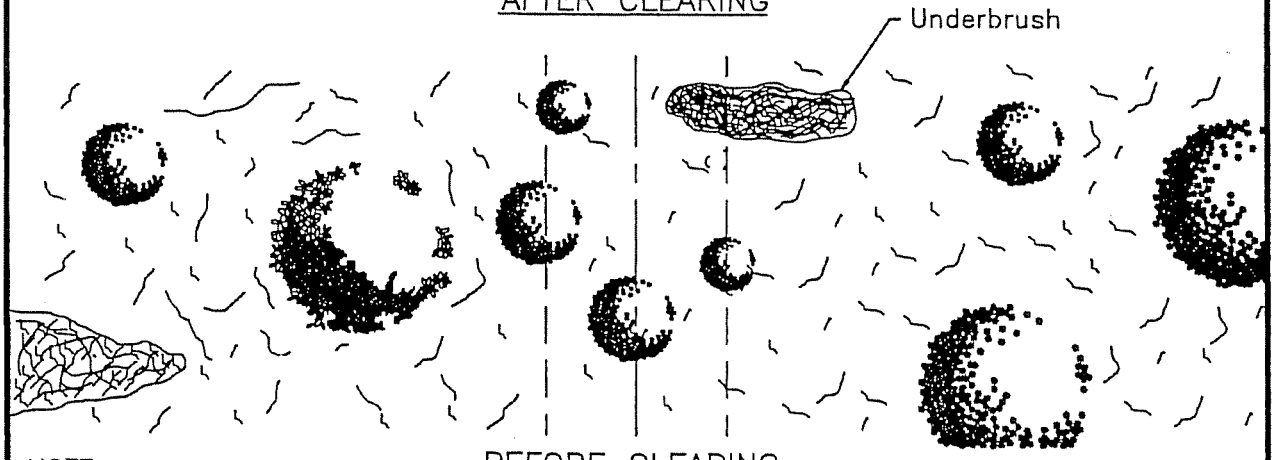
EXHIBIT 2



ELEVATION



AFTER CLEARING



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