




Shelby Energy  
Cooperative

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COMMISSION

March 25, 2014

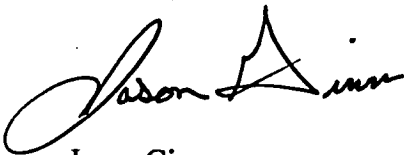
Director of Engineering  
Public Service Commission  
P.O. Box 615  
Frankfort, KY 40602-0615

RE: Administrative Case No. 2011-00450

Enclosed is the original paper copy of the 2013 Distribution Reliability Report for Shelby Energy Cooperative as requested in the above order dated May 30, 2013. We have also included (1) one electronic copy of the report.

Should you have any questions or need further information, please feel free to contact us.

Sincerely,



Jason Ginn  
V.P. of Operations & Engineering

Enclosures

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[www.shelbyenergy.com](http://www.shelbyenergy.com)

620 Old Finchville Road · Shelbyville, Kentucky 40065-1714

Shelby Co. (502)633-4420 · Trimble Co. (502)255-3260 · Henry Co. (502)845-2845

# Electric Distribution Utility Annual Reliability Report

## SECTION 1: CONTACT INFORMATION

UTILITY NAME	Shelby Energy Cooperative, Inc.
REPORT PREPARED BY	Distribution System Solutions, Inc. and Shelby Energy Cooperative
E-MAIL ADDRESS OF PREPARER	davidg@shelbyenergy.com
PHONE NUMBER OF PREPARER	502 633-4420

## SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	2013
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## SECTION 3: MAJOR EVENT DAYS

$T_{MED}$	14.31
FIRST DATE USED TO DETERMINE $T_{MED}$	1-Jan-08
LAST DATE USED TO DETERMINE $T_{MED}$	31-Dec-12
NUMBER OF MED IN REPORT YEAR	0

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 INFORMATION AND RESULTS

System-wide Information			
TOTAL CUSTOMERS	<u>15,501</u>	TOTAL CIRCUITS	<u>40</u>
Excluding MED			
5 YEAR AVERAGE		REPORTING YEAR	
SAIDI	<u>98.71</u>	SAIDI	<u>114.5</u>
SAIFI	<u>0.86</u>	SAIFI	<u>1.13</u>
Including MED			
5 YEAR AVERAGE		REPORTING YEAR	
SAIDI	<u>1,012.28</u>	SAIDI	<u>114.5</u>
SAIFI	<u>1.79</u>	SAIFI	<u>1.13</u>

- Notes:
- 1) All duration indices (SAIDI) 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, and  $T_{MED}$

# Electric Distribution Utility Annual Reliability Report

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## SECTION 5: Circuit Reporting

Circuits with SAIDI / SAIFI Exceeding Five Year Average Excluding MED

The percentages described in Item 8 of each response are the percentages of total annual minutes that the event took place compared to the circuit total of annual outage minutes.

1	Substation Name and Number	Logan #1
2	Substation Location	Brunerstown Rd
3	Circuit Number and Name	Feeder #4 Bullsken / Todd's Point
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	52
6	Customers on Circuit	413
7	Date of last circuit trim (VM)	2010
8	Outage Causes for Circuit along with Percentages	73% weather, 20% Trees
9	SAIDI 5 Year Average	126.66
10	Reporting Year SAIDI	111.6
11	SAIFI 5 Year Average	0.89
12	Reporting Year SAIFI	1.07
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes
1	Substation Name and Number	Clayvillage #2
2	Substation Location	Benson Rd
3	Circuit Number and Name	Feeder #1 Stapleton Rd
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	61
6	Customers on Circuit	397
7	Date of last circuit trim (VM)	2008
8	Outage Causes for Circuit along with Percentages	6% weather, 40% trees, 27% Equip Fault, 23% power supplier
9	SAIDI 5 Year Average	89.02
10	Reporting Year SAIDI	234.11
11	SAIFI 5 Year Average	1.24
12	Reporting Year SAIFI	2.56
13	Corrective Action Plan	Substation and transmission line upgraded 2013 and early 2014. Monitor circuit for additional outages and evaluate causes

<b>1</b>	<b>Substation Name and Number</b>	Clayvillage #2
<b>2</b>	<b>Substation Location</b>	Benson Rd
<b>3</b>	<b>Circuit Number and Name</b>	Feeder #2 Christianburg
<b>4</b>	<b>Circuit Location</b>	Shelby County
<b>5</b>	<b>Total Circuit Length (miles)</b>	54
<b>6</b>	<b>Customers on Circuit</b>	420
<b>7</b>	<b>Date of last circuit trim (VM)</b>	2013
<b>8</b>	<b>Outage Causes for Circuit along with Percentages</b>	65% weather, 24% trees, 8% power supplier
<b>9</b>	<b>SAIDI 5 Year Average</b>	172.41
<b>10</b>	<b>Reporting Year SAIDI</b>	663.31
<b>11</b>	<b>SAIFI 5 Year Average</b>	1.1
<b>12</b>	<b>Reporting Year SAIFI</b>	6.01
<b>13</b>	<b>Corrective Action Plan</b>	Substation and transmission line upgraded 2013 and early 2014. Monitor circuit for additional outages and evaluate causes

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<b>1</b>	<b>Substation Name and Number</b>	Clayvillage #2
<b>2</b>	<b>Substation Location</b>	Benson Rd
<b>3</b>	<b>Circuit Number and Name</b>	Feeder #3 Cedarmore
<b>4</b>	<b>Circuit Location</b>	Shelby County
<b>5</b>	<b>Total Circuit Length (miles)</b>	149
<b>6</b>	<b>Customers on Circuit</b>	1130
<b>7</b>	<b>Date of last circuit trim (VM)</b>	2006
<b>8</b>	<b>Outage Causes for Circuit along with Percentages</b>	43% weather, 13% trees, 29% power supplier
<b>9</b>	<b>SAIDI 5 Year Average</b>	106.86
<b>10</b>	<b>Reporting Year SAIDI</b>	188.33
<b>11</b>	<b>SAIFI 5 Year Average</b>	1.13
<b>12</b>	<b>Reporting Year SAIFI</b>	1.99
<b>13</b>	<b>Corrective Action Plan</b>	Substation and transmission line upgraded 2013 and early 2014. Monitor circuit for additional outages and evaluate causes

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<b>1</b>	<b>Substation Name and Number</b>	<b>Clayvillage #2</b>
<b>2</b>	<b>Substation Location</b>	<b>Benson Rd</b>
<b>3</b>	<b>Circuit Number and Name</b>	<b>Feeder #4 Knobs</b>
<b>4</b>	<b>Circuit Location</b>	<b>Shelby County</b>
<b>5</b>	<b>Total Circuit Length (miles)</b>	<b>36</b>
<b>6</b>	<b>Customers on Circuit</b>	<b>241</b>
<b>7</b>	<b>Date of last circuit trim (VM)</b>	<b>2012</b>
<b>8</b>	<b>Outage Causes for Circuit along with Percentages</b>	<b>56% weather, 14% trees, 24% power supplier</b>
<b>9</b>	<b>SAIDI 5 Year Average</b>	<b>155.5</b>
<b>10</b>	<b>Reporting Year SAIDI</b>	<b>225.39</b>
<b>11</b>	<b>SAIFI 5 Year Average</b>	<b>1.39</b>
<b>12</b>	<b>Reporting Year SAIFI</b>	<b>1.97</b>
<b>13</b>	<b>Corrective Action Plan</b>	<b>Substation and transmission line upgraded 2013 and early 2014. Monitor circuit for additional outages and evaluate causes</b>

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<b>1</b>	<b>Substation Name and Number</b>	<b>Clayvillage #2</b>
<b>2</b>	<b>Substation Location</b>	<b>Benson Rd</b>
<b>3</b>	<b>Circuit Number and Name</b>	<b>Feeder #5 Wright Elem/Rocket Ln</b>
<b>4</b>	<b>Circuit Location</b>	<b>Shelby County</b>
<b>5</b>	<b>Total Circuit Length (miles)</b>	<b>10</b>
<b>6</b>	<b>Customers on Circuit</b>	<b>266</b>
<b>7</b>	<b>Date of last circuit trim (VM)</b>	<b>2008</b>
<b>8</b>	<b>Outage Causes for Circuit along with Percentages</b>	<b>7% weather, 81% power supplier</b>
<b>9</b>	<b>SAIDI 5 Year Average</b>	<b>28.95</b>
<b>10</b>	<b>Reporting Year SAIDI</b>	<b>67.92</b>
<b>11</b>	<b>SAIFI 5 Year Average</b>	<b>0.44</b>
<b>12</b>	<b>Reporting Year SAIFI</b>	<b>1.07</b>
<b>13</b>	<b>Corrective Action Plan</b>	<b>Substation and transmission line upgraded 2013 and early 2014. Monitor circuit for additional outages and evaluate causes</b>

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1	Substation Name and Number	New Castle #3
2	Substation Location	South Property Rd
3	Circuit Number and Name	Feeder #2 Point Pleasant
4	Circuit Location	Henry County
5	Total Circuit Length (miles)	111
6	Customers on Circuit	562
7	Date of last circuit trim (VM)	2006
8	Outage Causes for Circuit along with Percentages	37% weather, 53% trees
9	SAIDI 5 Year Average	151.45
10	Reporting Year SAIDI	380.64
11	SAIFI 5 Year Average	1.39
12	Reporting Year SAIFI	1.59
13	Corrective Action Plan	Tree trimming scheduled for 2014. Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Campbellsburg #4
2	Substation Location	Orem Ln
3	Circuit Number and Name	Feeder #1 Mound Hill
4	Circuit Location	Henry County / Carroll County
5	Total Circuit Length (miles)	93
6	Customers on Circuit	674
7	Date of last circuit trim (VM)	2010
8	Outage Causes for Circuit along with Percentages	11% weather, 19% trees, 58% small animals
9	SAIDI 5 Year Average	122.83
10	Reporting Year SAIDI	152.69
11	SAIFI 5 Year Average	0.97
12	Reporting Year SAIFI	2.35
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Campbellsburg #4
2	Substation Location	Orem Ln
3	Circuit Number and Name	Feeder #2 Perry Park
4	Circuit Location	Henry County / Owen County
5	Total Circuit Length (miles)	100
6	Customers on Circuit	591
7	Date of last circuit trim (VM)	2008
8	Outage Causes for Circuit along with Percentages	1% weather, 7% trees, 76% equipment fault
9	SAIDI 5 Year Average	66.57
10	Reporting Year SAIDI	187.15
11	SAIFI 5 Year Average	0.71
12	Reporting Year SAIFI	1.2
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Campbellsburg #4
2	Substation Location	Orem Ln
3	Circuit Number and Name	Feeder #3 Hillsborough Rd
4	Circuit Location	Henry County
5	Total Circuit Length (miles)	58
6	Customers on Circuit	469
7	Date of last circuit trim (VM)	2013
8	Outage Causes for Circuit along with Percentages	3% weather, 72% trees, 7% small animals
9	SAIDI 5 Year Average	58.43
10	Reporting Year SAIDI	155.17
11	SAIFI 5 Year Average	0.6
12	Reporting Year SAIFI	2.46
13	Corrective Action Plan	Trees trimmed in 2013. Monitor circuit for additional outages and evaluate causes
<hr/>		
1	Substation Name and Number	Campbellsburg #4
2	Substation Location	Orem Ln
3	Circuit Number and Name	Feeder #4 C-burg Ind Park / State Police Post
4	Circuit Location	Henry County / Trimble County
5	Total Circuit Length (miles)	20
6	Customers on Circuit	479
7	Date of last circuit trim (VM)	2011
8	Outage Causes for Circuit along with Percentages	2% weather, 21% trees, 43% small animals
9	SAIDI 5 Year Average	70.55
10	Reporting Year SAIDI	204.95
11	SAIFI 5 Year Average	0.9
12	Reporting Year SAIFI	3.1
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes
<hr/>		
1	Substation Name and Number	Bedford #5
2	Substation Location	Cutshaw Ln
3	Circuit Number and Name	Feeder #3 Bray's Ridge
4	Circuit Location	Trimble County
5	Total Circuit Length (miles)	74
6	Customers on Circuit	372
7	Date of last circuit trim (VM)	2009
8	Outage Causes for Circuit along with Percentages	8% weather, 86% trees
9	SAIDI 5 Year Average	98.42
10	Reporting Year SAIDI	118.04
11	SAIFI 5 Year Average	0.96
12	Reporting Year SAIFI	0.87
13	Corrective Action Plan	Trees trimming scheduled for 2014. Monitor circuit for additional outages and evaluate causes

1	Substation Name and Number	Southville #6
2	Substation Location	Hempridge Rd
3	Circuit Number and Name	Feeder #2 Pea Ridge
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	40
6	Customers on Circuit	243
7	Date of last circuit trim (VM)	2012
8	Outage Causes for Circuit along with Percentages	38% weather, 47% equipment fault
9	SAIDI 5 Year Average	72.14
10	Reporting Year SAIDI	126.94
11	SAIFI 5 Year Average	0.58
12	Reporting Year SAIFI	1.51
13	Corrective Action Plan	OCR replaced in substation. Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Southville #6
2	Substation Location	Hempridge Rd
3	Circuit Number and Name	Feeder #3 Zaring Mill Rd
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	55
6	Customers on Circuit	480
7	Date of last circuit trim (VM)	2011
8	Outage Causes for Circuit along with Percentages	22% weather, 31% Scheduled Maint., 13% animal, 13% power supplier
9	SAIDI 5 Year Average	51.59
10	Reporting Year SAIDI	6.97
11	SAIFI 5 Year Average	0.45
12	Reporting Year SAIFI	1.65
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Milton #7
2	Substation Location	Peck's Pike Rd
3	Circuit Number and Name	Feeder #2 New Hope Rd / Milton Elementary
4	Circuit Location	Trimble County
5	Total Circuit Length (miles)	54
6	Customers on Circuit	679
7	Date of last circuit trim (VM)	2009
8	Outage Causes for Circuit along with Percentages	1% weather, 95% equipment fault
9	SAIDI 5 Year Average	99.16
10	Reporting Year SAIDI	98.18
11	SAIFI 5 Year Average	0.79
12	Reporting Year SAIFI	0.91
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Milton #7
2	Substation Location	Peck's Pike Rd
3	Circuit Number and Name	Feeder #3 Peck's Pike
4	Circuit Location	Trimble County
5	Total Circuit Length (miles)	22
6	Customers on Circuit	241
7	Date of last circuit trim (VM)	2011
8	Outage Causes for Circuit along with Percentages	2% weather, 84% vehicle, 11% animal
9	SAIDI 5 Year Average	119.8
10	Reporting Year SAIDI	71.26
11	SAIFI 5 Year Average	0.87
12	Reporting Year SAIFI	0.9
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes
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1	Substation Name and Number	Jericho #11
2	Substation Location	Lake Jericho Rd
3	Circuit Number and Name	Feeder #2 Pendleton
4	Circuit Location	Henry County
5	Total Circuit Length (miles)	29
6	Customers on Circuit	513
7	Date of last circuit trim (VM)	2011
8	Outage Causes for Circuit along with Percentages	4% weather, 24% trees, 43% vehicle, 15% animal
9	SAIDI 5 Year Average	30.98
10	Reporting Year SAIDI	61.5
11	SAIFI 5 Year Average	0.35
12	Reporting Year SAIFI	0.45
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes
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1	Substation Name and Number	Jericho #11
2	Substation Location	Lake Jericho Rd
3	Circuit Number and Name	Feeder #3 Smithfield
4	Circuit Location	Henry County
5	Total Circuit Length (miles)	51
6	Customers on Circuit	439
7	Date of last circuit trim (VM)	2010
8	Outage Causes for Circuit along with Percentages	33% weather, 36% unknown, 16% equipment fault, 11% animal
9	SAIDI 5 Year Average	125.63
10	Reporting Year SAIDI	43.55
11	SAIFI 5 Year Average	0.46
12	Reporting Year SAIFI	0.49
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes

1	Substation Name and Number	Bekaert #2 Substation #12
2	Substation Location	Shelby County Industrial Park
3	Circuit Number and Name	Feeder #2 Lowes / Walmart
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	6
6	Customers on Circuit	12
7	Date of last circuit trim (VM)	2013
8	Outage Causes for Circuit along with Percentages	100% animal
9	SAIDI 5 Year Average	26.52
10	Reporting Year SAIDI	112
11	SAIFI 5 Year Average	0.35
12	Reporting Year SAIFI	1.17
13	Corrective Action Plan	Installed additional cover-up material to prevent animal contact in substation. Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Bekaert #2 Substation #12
2	Substation Location	Shelby County Industrial Park
3	Circuit Number and Name	Feeder #3 Omega #1
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	1.5
6	Customers on Circuit	12
7	Date of last circuit trim (VM)	2013
8	Outage Causes for Circuit along with Percentages	79% equipment fault, 16% animal
9	SAIDI 5 Year Average	39.62
10	Reporting Year SAIDI	96.35
11	SAIFI 5 Year Average	0.51
12	Reporting Year SAIFI	0.92
13	Corrective Action Plan	Monitor circuit for additional outages and evaluate causes

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1	Substation Name and Number	Bekaert #3 Substation #14
2	Substation Location	Shelby County Industrial Park
3	Circuit Number and Name	Feeder #2 Sigma
4	Circuit Location	Shelby County
5	Total Circuit Length (miles)	0.6
6	Customers on Circuit	4
7	Date of last circuit trim (VM)	2013
8	Outage Causes for Circuit along with Percentages	100% equipment fault
9	SAIDI 5 Year Average	0
10	Reporting Year SAIDI	61.5
11	SAIFI 5 Year Average	0
12	Reporting Year SAIFI	0.5
13	Corrective Action Plan	Equipment fault was due to temporary jumper failure while extending the 3-phase line. Monitor circuit for additional outages and evaluate causes

# **ELECTRIC DISTRIBUTION UTILITY ANNUAL RELIABILITY REPORT**

## **SECTION 6: VEGETATION MANAGEMENT REVIEW AND PLAN**

### **VEGETATION MANAGEMENT PLAN (VMP)**

Shelby Energy Cooperative ("Shelby") is an electric distribution system serving ten (10) counties in north-central Kentucky: Shelby, Henry, Trimble, Carroll, Owen, Oldham, Jefferson, Franklin, Spencer, and Anderson. The system consists of approximately 16,029 meters/accounts and approximately 1,831 miles of overhead and underground primary conductor. Shelby has approximately 376 miles of secondary and services. Members are served by fourteen (14) 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 the mission statement for Shelby Energy Cooperative:

*"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 safe environment within Shelby's territory. VM reduces the possibility of accidental contact with energized power lines thus providing safer conditions for the public, for employees and contractors. Reliability and power quality enhancements are also afforded by proper VM.

### **RIGHT OF WAY (ROW) CLEARING CYCLE**

Shelby uses a clearing cycle of five (5) to six (6) years that combines ROW trimming, spraying and mowing. The variance of five (5) to six (6) years is used to adjust the clearing cycle based on yearly growing conditions. This in turn helped Shelby prioritize the circuits to be managed. Hourly contract cutting crews are utilized by Shelby with no less than one (1) crew working year around as weather and/or work permits.

Routinely one (1) spray crew is used several months during the summer season to control undergrowth in areas where the ROW was trimmed /cut the previous year. The spraying is focused in cross country areas where high undergrowth problems are recognized. On average, 350 circuit-miles are cleared of vegetation by trimming, cutting and/or spraying annually. Shelby re-bid their ROW in 2013 with several different

# **ELECTRIC DISTRIBUTION UTILITY ANNUAL RELIABILITY REPORT**

## **SECTION 6: VEGETATION MANAGEMENT REVIEW AND PLAN**

tree service companies. Multiple companies were selected for the following two (2) year contract. These companies utilize their employees as well as various types of equipment to ensure the ROW is maintained in the manner we require. These crews and equipment enables Shelby to cover additional rough terrain and clear ROW issues in many cross country locations.

### **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 O&E 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 the severity of the issue.

### **RELIABILITY CRITERIA AND REPORTS**

Shelby's Operations and Engineering (O&E) employees 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.

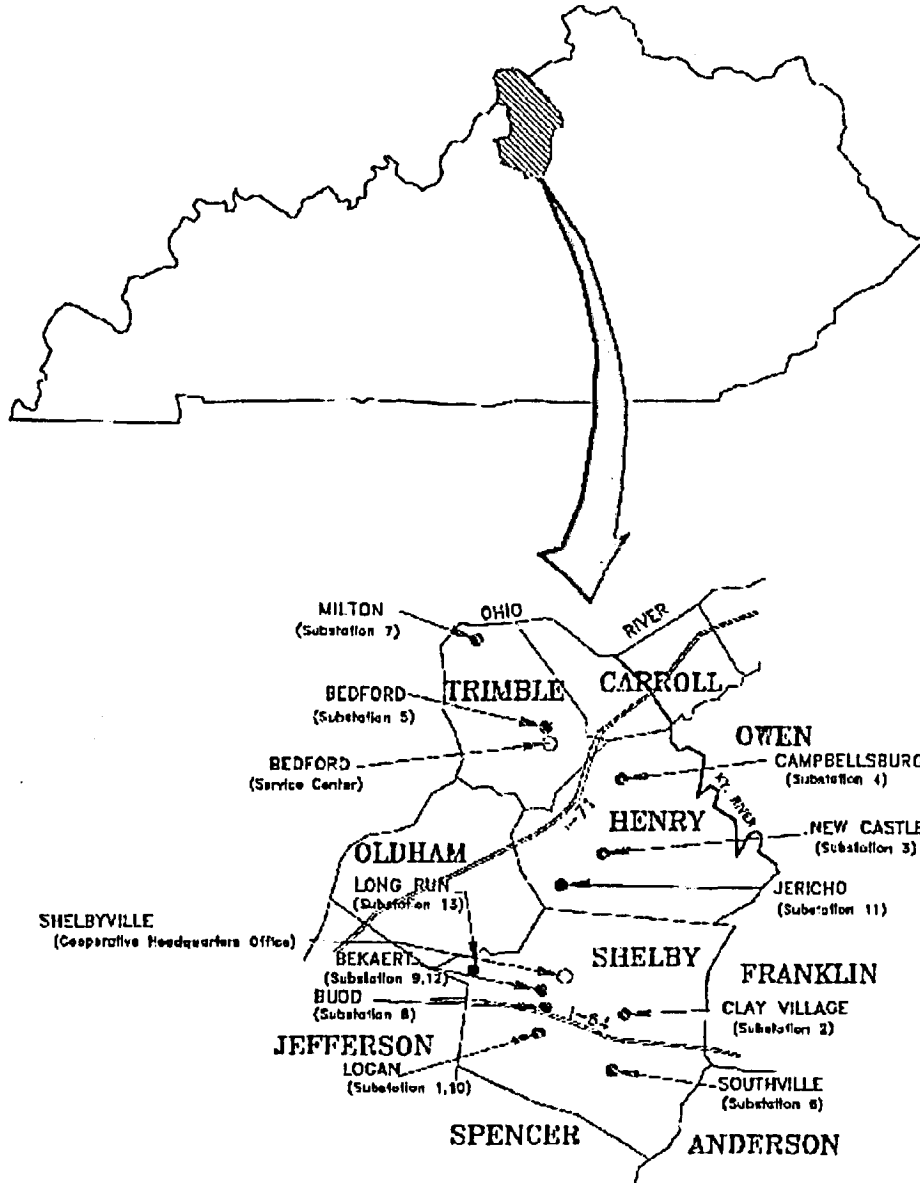
### **PLAN EVALUATION**

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 O&E department work with a professional engineering consultant to calculate, review, and evaluate standard reliability indices of SAIFI, SAIDI, and CAIDI. Shelby's O&E personnel and its professional engineering consultant continuously monitor and verify that reliability issues are resolved in such a manner that best benefits the members of the cooperative.

**ELECTRIC DISTRIBUTION UTILITY ANNUAL RELIABILITY REPORT**

**SECTION 6: VEGETATION MANAGEMENT REVIEW AND PLAN**

Exhibit # 1

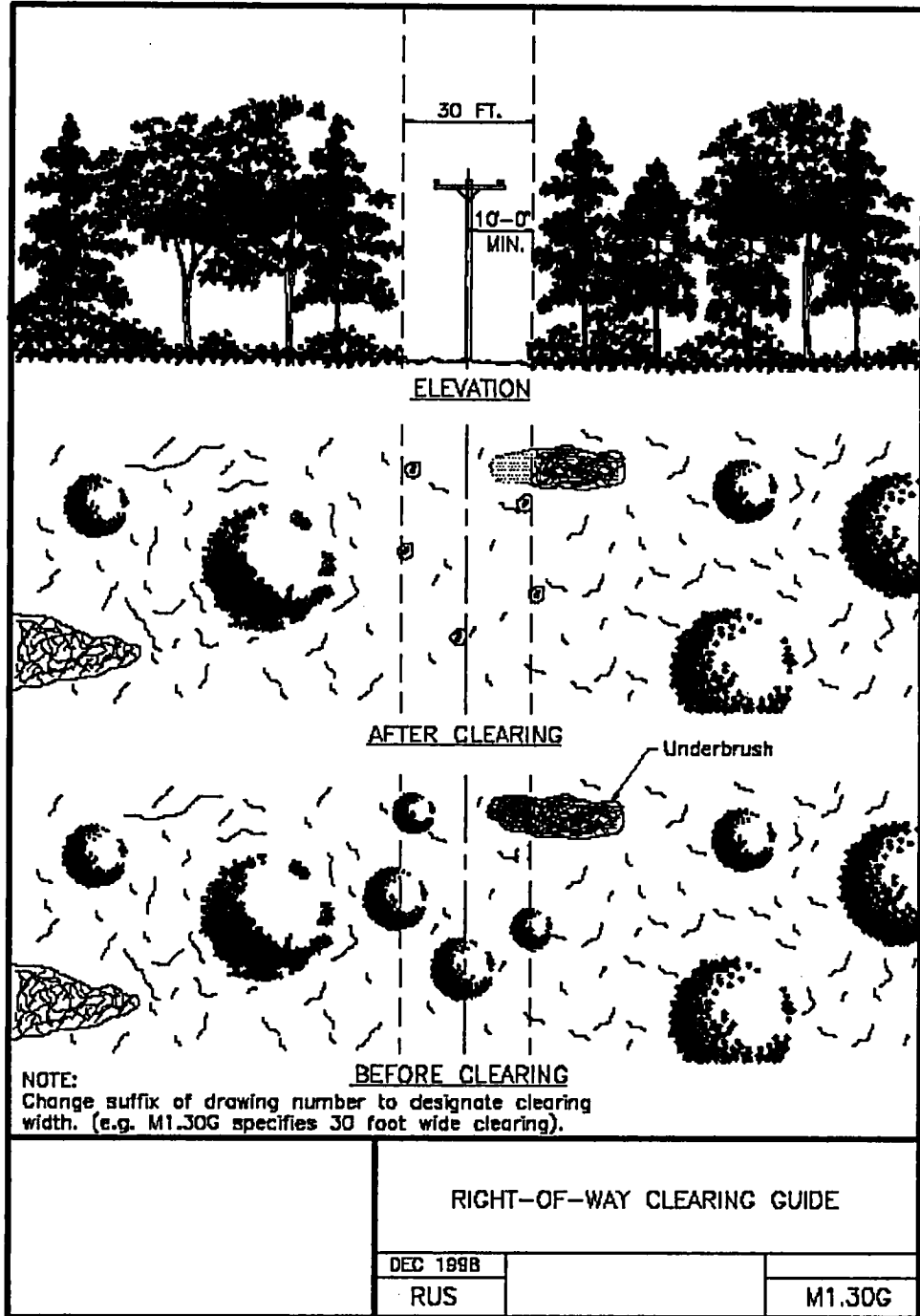


**SHELBY ENERGY COOPERATIVE  
SERVICE AREA**

**ELECTRIC DISTRIBUTION UTILITY ANNUAL RELIABILITY REPORT**

**SECTION 6: VEGETATION MANAGEMENT REVIEW AND PLAN**

**Exhibit #2**



**ELECTRIC DISTRIBUTION UTILITY ANNUAL RELIABILITY REPORT**

**SECTION 7: UTILITY COMMENTS**

**Shelby Energy Cooperative has no additional comments at this time.**