


OWEN Electric

A Touchstone Energy Cooperative 

RECEIVED

APR 27 2018

PUBLIC SERVICE
COMMISSION

April 23, 2018

Ms. Gwen Pinson
Executive Director
Kentucky Public Service Commission
P.O. Box 615
Frankfort, Kentucky 40602-0615

RE: Administrative Case No. 2011-00450

Dear Ms. Pinson,

Enclosed are the original and one (1) electronic copy of the 2017 Distribution Reliability Report, for Owen Electric Cooperative, as requested in the revisions to the aforementioned order.

Should you have any questions or need further information, please contact our office at 1-800-372-7612.

Sincerely,



Andrew Long
System Engineer

Enclosures

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 1: CONTACT INFORMATION

UTILITY NAME	Owen Electric Cooperative
REPORT PREPARED BY	Drew Long
E-MAIL ADDRESS OF PREPARER	along@owenelectric.com
PHONE NUMBER OF PREPARER	(502) 563-3522

SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	2017
-------------------------	------

SECTION 3: MAJOR EVENT DAYS

T_{MED}	7.663
FIRST DATE USED TO DETERMINE T_{MED}	1-Jan-2012
LAST DATE USED TO DETERMINE T_{MED}	31-Dec-2016
NUMBER OF MED IN REPORT YEAR	1

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>60,855</u>	TOTAL CIRCUITS	<u>129</u>
Excluding MED			
5 YEAR AVERAGE		REPORTING YEAR	
SAIDI	<u>117.44</u>	SAIDI	<u>106.06</u>
SAIFI	<u>1.24</u>	SAIFI	<u>1.34</u>
Including MED			
5 YEAR AVERAGE		REPORTING YEAR	
SAIDI	<u>174.40</u>	SAIDI	<u>399.96</u>
SAIFI	<u>1.42</u>	SAIFI	<u>1.78</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 May 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

Circuit # 1

5.1.1	SUBSTATION NAME AND NUMBER	RICHARDSON II(55)
5.1.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.1.3	CIRCUIT NAME AND NUMBER	RICHARDSON II(55), Circuit 5, 5505
5.1.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.1.5	TOTAL CIRCUIT LENGTH (MILES)	9.2
5.1.6	CUSTOMER COUNT FOR THIS CIRCUIT	612
5.1.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.1.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	50.00%	36.42%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	50.00%	63.58%

5.1.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.291
5.1.10	REPORTING YEAR (SAIDI)	0.311
5.1.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.1.12	REPORTING YEAR (SAIFI)	0.004

5.1.13 CORRECTIVE ACTION PLAN:

A tree in a yard fell into the line, causing the majority of the SAIDI and half the SAIFI contributions for the year. The Right of Way was cut in 2017, but was cut in September and the outage was in July. Second outage was unknown cause, but on the same device just before the tree outage, which likely shows the tree may have caused the first outage as well.

Action Plan

None at this time. The right of way has since been cut on this circuit.

Circuit # 2

5.2.1	SUBSTATION NAME AND NUMBER	DURO II(54)
5.2.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.2.3	CIRCUIT NAME AND NUMBER	DURO II(54), Circuit 2, 5402
5.2.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.2.5	TOTAL CIRCUIT LENGTH (MILES)	12.5
5.2.6	CUSTOMER COUNT FOR THIS CIRCUIT	619
5.2.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.2.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	1.99%	1.33%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	2.52%	17.09%
Scheduled	0.00%	0.00%
Unknown	2.52%	3.56%
Weather	90.60%	70.50%
Age/Deterioration	0.53%	5.60%
R.O.W. Preventable	1.85%	1.93%

5.2.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.206
5.2.10	REPORTING YEAR (SAIDI)	0.632
5.2.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.2.12	REPORTING YEAR (SAIFI)	0.012

5.2.13 CORRECTIVE ACTION PLAN:

Outages from storms on two days, Nov. 18th and July 23rd, caused the majority of the SAIDI and SAIFI contributions, with wind and lightning being the major causes of the outages

Action Plan

Review lightning arrestor placement, as multiple outages were caused by lightning, also circuit trim was done in the fall of 2017, so newly trimmed circuit should also help prevent some outages that were caused by right of way.

Circuit # 3

5.3.1	SUBSTATION NAME AND NUMBER	SMOOT II(53)
5.3.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.3.3	CIRCUIT NAME AND NUMBER	SMOOT II(53), Circuit 5, 5305
5.3.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.3.5	TOTAL CIRCUIT LENGTH (MILES)	18.7
5.3.6	CUSTOMER COUNT FOR THIS CIRCUIT	1428
5.3.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.3.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	1.12%	2.59%
Equipment/Installation	1.65%	3.16%
Member/Public	46.09%	33.83%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	25.00%	9.14%
Weather	24.84%	32.75%
Age/Deterioration	1.09%	15.25%
R.O.W. Preventable	0.04%	0.08%

5.3.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.479
5.3.10	REPORTING YEAR (SAIDI)	2.787
5.3.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.012
5.3.12	REPORTING YEAR (SAIFI)	0.094

5.3.13 CORRECTIVE ACTION PLAN:

Circuit # 4

5.4.1	SUBSTATION NAME AND NUMBER	SMITH II(52)
5.4.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.4.3	CIRCUIT NAME AND NUMBER	SMITH II(52), Circuit 2, 5202
5.4.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.4.5	TOTAL CIRCUIT LENGTH (MILES)	4.1
5.4.6	CUSTOMER COUNT FOR THIS CIRCUIT	250
5.4.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.4.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	100.00%	100.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.4.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.314
5.4.10	REPORTING YEAR (SAIDI)	0.302
5.4.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.4.12	REPORTING YEAR (SAIFI)	0.004

5.4.13 CORRECTIVE ACTION PLAN:

There was one outage on this feeder for the year, due to an equipment malfunction of having the wire pull out of a quicksleeve.

Action Plan

None at this time, appears to be an isolated incident, continue with normal line inspection and installation practices.

Circuit # 5

5.5.1	SUBSTATION NAME AND NUMBER	GRANTSLICK II(51)
5.5.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.5.3	CIRCUIT NAME AND NUMBER	GRANTSLICK II(51), Circuit 1, 5101
5.5.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.5.5	TOTAL CIRCUIT LENGTH (MILES)	134.5
5.5.6	CUSTOMER COUNT FOR THIS CIRCUIT	1530
5.5.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.5.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.38%	0.38%
Equipment/Installation	0.19%	0.17%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	61.86%	66.22%
Scheduled	0.03%	0.02%
Unknown	0.96%	0.75%
Weather	36.31%	29.83%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.11%	0.11%

5.5.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	4.590
5.5.10	REPORTING YEAR (SAIDI)	6.484
5.5.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.037
5.5.12	REPORTING YEAR (SAIFI)	0.060

5.5.13 CORRECTIVE ACTION PLAN:

This is a long 14.4 circuit which causes a lot of exposure. Lightning and storm related outages were a large factor, that also influenced unpreventable R.O.W outages.

Action Plan:

Continue with Right of Way program and spot cut as determined necessary by Right of Way Manager. Implementing a recoordination scheme using all electronic reclosers to help limit outages and provide more information in the event an outage occurs.

Circuit # 6

5.6.1	SUBSTATION NAME AND NUMBER	RICHWOOD(26)
5.6.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.6.3	CIRCUIT NAME AND NUMBER	RICHWOOD(26), Circuit 4, 2604
5.6.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.6.5	TOTAL CIRCUIT LENGTH (MILES)	15.9
5.6.6	CUSTOMER COUNT FOR THIS CIRCUIT	463
5.6.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.6.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	19.67%	13.54%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	18.03%	19.24%
Scheduled	20.22%	28.54%
Unknown	20.22%	22.98%
Weather	21.31%	12.93%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.6.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.086
5.6.10	REPORTING YEAR (SAIDI)	0.251
5.6.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.6.12	REPORTING YEAR (SAIFI)	0.003

5.6.13 CORRECTIVE ACTION PLAN:

There were several different types of outages on this circuit, a scheduled outage to replace some cable in a subdivision accounted for nearly 20% of the SAIFI and SAIDI contribution, but also the unpreventable right of way, and weather were significant contributors.

Action Plan:
Continue to implement wildlife guards where appropriate and continue Right of Way schedule.

Circuit # 7

5.7.1	SUBSTATION NAME AND NUMBER	STERLING(25)
5.7.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.7.3	CIRCUIT NAME AND NUMBER	STERLING(25), Circuit 4, 2504
5.7.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.7.5	TOTAL CIRCUIT LENGTH (MILES)	0.6
5.7.6	CUSTOMER COUNT FOR THIS CIRCUIT	1
5.7.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.7.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	0.00%	0.00%
Age/Deterioration	100.00%	100.00%
R.O.W. Preventable	0.00%	0.00%

5.7.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.001
5.7.10	REPORTING YEAR (SAIDI)	0.001
5.7.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.7.12	REPORTING YEAR (SAIFI)	0.000

5.7.13 CORRECTIVE ACTION PLAN:

Circuit # 8

5.8.1	SUBSTATION NAME AND NUMBER	STERLING(25)
5.8.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.8.3	CIRCUIT NAME AND NUMBER	STERLING(25), Circuit 1, 2501
5.8.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.8.5	TOTAL CIRCUIT LENGTH (MILES)	44.3
5.8.6	CUSTOMER COUNT FOR THIS CIRCUIT	543
5.8.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.8.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.60%	0.22%
Equipment/Installation	0.13%	0.16%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	13.23%	25.92%
Scheduled	0.00%	0.00%
Unknown	4.17%	1.79%
Weather	60.45%	30.92%
Age/Deterioration	0.53%	0.56%
R.O.W. Preventable	18.85%	26.97%

5.8.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.552
5.8.10	REPORTING YEAR (SAIDI)	4.145
5.8.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.019
5.8.12	REPORTING YEAR (SAIFI)	0.025

5.8.13 CORRECTIVE ACTION PLAN:

Inclement weather caused this feeder to be over the SAIDI and SAIFI five year rolling average, by causing multiple outages throughout the year. A few lingering Ash trees also caused a few outages.

Action Plan:
 A new sectionizing study is scheduled to be completed in 2018 to help reduce duration and size of outages and right of way is scheduled to be cut in 2018 as well.

Circuit # 9

5.9.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.9.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.9.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 5, 2405
5.9.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.9.5	TOTAL CIRCUIT LENGTH (MILES)	7.4
5.9.6	CUSTOMER COUNT FOR THIS CIRCUIT	556
5.9.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.9.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	86.55%	98.03%
Scheduled	0.00%	0.00%
Unknown	13.45%	1.97%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.9.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.123
5.9.10	REPORTING YEAR (SAIDI)	1.247
5.9.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.9.12	REPORTING YEAR (SAIFI)	0.010

5.9.13 CORRECTIVE ACTION PLAN:

The main cause of the SAIDI and SAIFI being over the five year average was 547 members losing power due to a yard tree causing an outage.

Action Plan:

Right of way is scheduled to be cut in 2018.

Circuit # 10

5.10.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.10.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.10.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 4, 2404
5.10.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.10.5	TOTAL CIRCUIT LENGTH (MILES)	15.8
5.10.6	CUSTOMER COUNT FOR THIS CIRCUIT	412
5.10.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.10.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	74.87%	52.43%
Scheduled	0.00%	0.00%
Unknown	9.17%	6.71%
Weather	11.71%	5.39%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.10.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.941
5.10.10	REPORTING YEAR (SAIDI)	1.510
5.10.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.10.12	REPORTING YEAR (SAIFI)	0.010

5.10.13 CORRECTIVE ACTION PLAN:

In the month of May several outages caused the SAIDI and SAIFI to be over the last five year average. Most were due to unpreventable right of way getting into the lines.

Action Plan:
 This circuits Right of Way is planned to be cut in 2018, which will help with some right of way problems.

Circuit # 11

5.11.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.11.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.11.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 3, 2403
5.11.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.11.5	TOTAL CIRCUIT LENGTH (MILES)	13.5
5.11.6	CUSTOMER COUNT FOR THIS CIRCUIT	474
5.11.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.11.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	4.43%	4.79%
Equipment/Installation	2.48%	8.49%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	3.10%	5.46%
Scheduled	0.00%	0.00%
Unknown	3.10%	0.92%
Weather	0.09%	0.10%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	86.80%	80.23%

5.11.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.172
5.11.10	REPORTING YEAR (SAIDI)	0.937
5.11.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.11.12	REPORTING YEAR (SAIFI)	0.019

5.11.13 CORRECTIVE ACTION PLAN:

Right of Way was the largest contributor of SAIFI and SAIDI and was the cause of making this circuit have a worse than 5 year average performance.

Action Plan:

Right of Way is planned to be cut in 2018 which will reduce outages.

Circuit # 12

5.12.1	SUBSTATION NAME AND NUMBER	BAVARIAN(23)
5.12.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.12.3	CIRCUIT NAME AND NUMBER	BAVARIAN(23), Circuit 2, 2302
5.12.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.12.5	TOTAL CIRCUIT LENGTH (MILES)	35.2
5.12.6	CUSTOMER COUNT FOR THIS CIRCUIT	425
5.12.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.12.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	10.22%	4.23%
Equipment/Installation	4.92%	3.58%
Member/Public	54.08%	68.46%
R.O.W. Unpreventable	5.82%	6.96%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	16.17%	13.09%
Age/Deterioration	0.13%	0.11%
R.O.W. Preventable	8.67%	3.57%

5.12.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.539
5.12.10	REPORTING YEAR (SAIDI)	2.467
5.12.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.12.12	REPORTING YEAR (SAIFI)	0.013

5.12.13 CORRECTIVE ACTION PLAN:

A public caused outage caused approximately 400 members to be without power for a few hours in order to replace the damaged pole. This in addition to multiple storm related outages caused this feeder to have higher SAIFI and SAIDI than the previous five years.

Action Plan:

No additional action will be taken at this time, however, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 13

5.13.1	SUBSTATION NAME AND NUMBER	BAVARIAN(23)
5.13.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.13.3	CIRCUIT NAME AND NUMBER	BAVARIAN(23), Circuit 1, 2301
5.13.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.13.5	TOTAL CIRCUIT LENGTH (MILES)	25.6
5.13.6	CUSTOMER COUNT FOR THIS CIRCUIT	417
5.13.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.13.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	20.08%	23.10%
Equipment/Installation	0.27%	0.24%
Member/Public	58.09%	44.80%
R.O.W. Unpreventable	4.99%	4.72%
Scheduled	0.00%	0.00%
Unknown	1.21%	0.69%
Weather	13.61%	25.68%
Age/Deterioration	1.75%	0.77%
R.O.W. Preventable	0.00%	0.00%

5.13.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.488
5.13.10	REPORTING YEAR (SAIDI)	0.944
5.13.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.009
5.13.12	REPORTING YEAR (SAIFI)	0.012

5.13.13 CORRECTIVE ACTION PLAN:

An accident caused by the public breaking an A1, caused nearly half of the SAIDI and SAIFI contributions for the previous year. Weather was the other significant factor.

Action Plan:

Continue the current line inspection and review over-voltage protection. Engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 14

5.14.1	SUBSTATION NAME AND NUMBER	HEBRON(22)
5.14.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.14.3	CIRCUIT NAME AND NUMBER	HEBRON(22), Circuit 5, 2205
5.14.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.14.5	TOTAL CIRCUIT LENGTH (MILES)	5.2
5.14.6	CUSTOMER COUNT FOR THIS CIRCUIT	507
5.14.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.14.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	100.00%	100.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.14.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.001
5.14.10	REPORTING YEAR (SAIDI)	0.105
5.14.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.14.12	REPORTING YEAR (SAIFI)	0.002

5.14.13 CORRECTIVE ACTION PLAN:

Overall this is a very reliable circuit and is mostly underground. One lightning event caused an outage which contributed to all the SAIFI and SAID contributions

Action Plan:
There is not planned action at this time.

Circuit # 15

5.15.1	SUBSTATION NAME AND NUMBER	HEBRON(22)
5.15.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.15.3	CIRCUIT NAME AND NUMBER	HEBRON(22), Circuit 4, 2204
5.15.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.15.5	TOTAL CIRCUIT LENGTH (MILES)	31.4
5.15.6	CUSTOMER COUNT FOR THIS CIRCUIT	694
5.15.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.15.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	72.99%	63.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	8.81%	19.77%
Scheduled	0.00%	0.00%
Unknown	3.39%	3.74%
Weather	10.07%	9.86%
Age/Deterioration	2.23%	1.09%
R.O.W. Preventable	2.52%	2.55%

5.15.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.729
5.15.10	REPORTING YEAR (SAIDI)	1.672
5.15.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.006
5.15.12	REPORTING YEAR (SAIFI)	0.017

5.15.13 CORRECTIVE ACTION PLAN:

Wildlife outages were the main cause of outages and caused the incides to be higher than the five year rolling average

Action Plan:
Review wildlife guards in certain areas of the circuit to determine if additional or new protection is needed.

Circuit # 16

5.16.1	SUBSTATION NAME AND NUMBER	DOWNING(20)
5.16.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.16.3	CIRCUIT NAME AND NUMBER	DOWNING(20), Circuit 3, 2003
5.16.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.16.5	TOTAL CIRCUIT LENGTH (MILES)	3.1
5.16.6	CUSTOMER COUNT FOR THIS CIRCUIT	41
5.16.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.16.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	97.56%	95.03%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	2.44%	4.97%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.16.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.023
5.16.10	REPORTING YEAR (SAIDI)	0.107
5.16.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.16.12	REPORTING YEAR (SAIFI)	0.001

5.16.13 CORRECTIVE ACTION PLAN:

This circuit is relatively short and has few consumers, but several larger 3 phase accounts and about half is underground. A dead tree out of the Right of Way broke causing the whole feeder to lockout, causing the indices to be higher than the five year rolling average.

Action Plan:

There are no additional plans in addition to maintaining Right of Way Trim Schedule and line inspection schedule.

Circuit # 17

5.17.1	SUBSTATION NAME AND NUMBER	DOWNING(20)
5.17.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.17.3	CIRCUIT NAME AND NUMBER	DOWNING(20), Circuit 1, 2001
5.17.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.17.5	TOTAL CIRCUIT LENGTH (MILES)	17.5
5.17.6	CUSTOMER COUNT FOR THIS CIRCUIT	1158
5.17.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.17.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	50.37%	72.97%
Weather	49.63%	27.03%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.17.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.546
5.17.10	REPORTING YEAR (SAIDI)	2.853
5.17.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.047
5.17.12	REPORTING YEAR (SAIFI)	0.038

5.17.13 CORRECTIVE ACTION PLAN:

Lightning opened the substation breaker in one outage that was a significant contributor to the SAIDI and SAIFI metrics. While the largest portion is unknown outage causes. Also, there were two lightning arrestors that failed.

Action Plan:

Continue current line inspection program.

Circuit # 18

5.18.1	SUBSTATION NAME AND NUMBER	RICHARDSON(19)
5.18.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.18.3	CIRCUIT NAME AND NUMBER	RICHARDSON(19), Circuit 3, 1903
5.18.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.18.5	TOTAL CIRCUIT LENGTH (MILES)	18.2
5.18.6	CUSTOMER COUNT FOR THIS CIRCUIT	923
5.18.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.18.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	75.88%	72.55%
Birds/Animals	2.41%	0.57%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	10.85%	11.78%
Scheduled	0.00%	0.00%
Unknown	1.03%	0.57%
Weather	0.95%	2.00%
Age/Deterioration	0.09%	0.18%
R.O.W. Preventable	0.00%	0.00%

5.18.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.619
5.18.10	REPORTING YEAR (SAIDI)	1.956
5.18.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.017
5.18.12	REPORTING YEAR (SAIFI)	0.019

5.18.13 CORRECTIVE ACTION PLAN:

A transmission outage problem caused the majority of the SAIDI and SAIFI contributions for this circuit.

Action Plan:

There is no action planned on this circuit.

Circuit # 19

5.28.5	SUBSTATION NAME AND NUMBER	RICHARDSON(19)
5.28.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.28.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT(10), Circuit 2, 1002
5.28.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.28.5	TOTAL CIRCUIT LENGTH (MILES)	2.6
5.28.6	CUSTOMER COUNT FOR THIS CIRCUIT	157
5.28.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.28.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	100.00%	100.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.28.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.105
5.28.10	REPORTING YEAR (SAIDI)	0.087
5.28.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.28.12	REPORTING YEAR (SAIFI)	0.002

5.28.13 CORRECTIVE ACTION PLAN:

A high wind weather event caused the single outage on this circuit for the year.

Action Plan:
No additional action taken on this circuit.

Circuit # 20

5.20.1	SUBSTATION NAME AND NUMBER	GALLATIN(18)
5.20.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.20.3	CIRCUIT NAME AND NUMBER	GALLATIN(18), Circuit 2, 1802
5.20.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.20.5	TOTAL CIRCUIT LENGTH (MILES)	59.9
5.20.6	CUSTOMER COUNT FOR THIS CIRCUIT	745
5.20.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.20.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	9.26%	6.35%
Equipment/Installation	0.00%	0.00%
Member/Public	52.93%	49.50%
R.O.W. Unpreventable	7.02%	6.29%
Scheduled	0.00%	0.00%
Unknown	8.47%	10.35%
Weather	17.26%	21.16%
Age/Deterioration	1.63%	2.25%
R.O.W. Preventable	3.35%	1.94%

5.20.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.329
5.20.10	REPORTING YEAR (SAIDI)	3.019
5.20.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.026
5.20.12	REPORTING YEAR (SAIFI)	0.035

5.20.13 CORRECTIVE ACTION PLAN:

A member of the public accidentally fell a tree onto the distribution lines causing nearly 50% of the SAIDI and SAIFI contributions for the 2017 reporting year.

Action Plan:

No action at this time, however, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 21

5.21.1	SUBSTATION NAME AND NUMBER	DURO(17)
5.21.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.21.3	CIRCUIT NAME AND NUMBER	DURO(17), Circuit 6, 1706
5.21.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.21.5	TOTAL CIRCUIT LENGTH (MILES)	11.7
5.21.6	CUSTOMER COUNT FOR THIS CIRCUIT	423
5.21.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.21.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	5.56%	8.25%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	13.89%	31.20%
Scheduled	0.00%	0.00%
Unknown	8.33%	13.92%
Weather	72.22%	46.62%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.21.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.021
5.21.10	REPORTING YEAR (SAIDI)	0.032
5.21.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.21.12	REPORTING YEAR (SAIFI)	0.001

5.21.13 CORRECTIVE ACTION PLAN:

This circuit exceed the 5 yr rolling average due to mainly weather contributions

Action Plan:
Continue with over-voltage protection and the ROW management programs.

Circuit # 22

5.22.1	SUBSTATION NAME AND NUMBER	SMOOT(16)
5.22.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.22.3	CIRCUIT NAME AND NUMBER	SMOOT(16), Circuit 3, 1603
5.22.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.22.5	TOTAL CIRCUIT LENGTH (MILES)	5.0
5.22.6	CUSTOMER COUNT FOR THIS CIRCUIT	307
5.22.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.22.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	85.67%	31.93%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	14.33%	68.07%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.22.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.104
5.22.10	REPORTING YEAR (SAIDI)	0.126
5.22.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.22.12	REPORTING YEAR (SAIFI)	0.006

5.22.13 CORRECTIVE ACTION PLAN:

Necessary equipment maintenance required the circuit to be momentarily deenergized while switching took place.

Action Plan:

Continue with current line inspection plan to identify any equipment that may be failing prematurely.

Circuit # 23

5.23.1	SUBSTATION NAME AND NUMBER	BIG BONE(12)
5.23.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.23.3	CIRCUIT NAME AND NUMBER	BIG BONE(12), Circuit 4, 1204
5.23.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.23.5	TOTAL CIRCUIT LENGTH (MILES)	21.6
5.23.6	CUSTOMER COUNT FOR THIS CIRCUIT	198
5.23.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.23.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	1.12%	0.55%
Equipment/Installation	0.00%	0.00%
Member/Public	2.23%	2.27%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	19.70%	21.47%
Weather	76.95%	75.71%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.23.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.347
5.23.10	REPORTING YEAR (SAIDI)	0.373
5.23.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.23.12	REPORTING YEAR (SAIFI)	0.004

5.23.13 CORRECTIVE ACTION PLAN:

The circuit was affected mostly by inclement weather which contributed to a higher than rolling five year average of SAIDI.

Action Plan:

Change out remaining hydraulic reclosers to electronic to have better response times.

Circuit # 24

5.24.1	SUBSTATION NAME AND NUMBER	BIG BONE(12)
5.24.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.24.3	CIRCUIT NAME AND NUMBER	BIG BONE(12), Circuit 1, 1201
5.24.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.24.5	TOTAL CIRCUIT LENGTH (MILES)	48.9
5.24.6	CUSTOMER COUNT FOR THIS CIRCUIT	616
5.24.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.24.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	4.95%	3.02%
Equipment/Installation	0.12%	0.07%
Member/Public	1.77%	0.81%
R.O.W. Unpreventable	24.29%	35.59%
Scheduled	0.00%	0.00%
Unknown	6.13%	3.10%
Weather	33.14%	31.98%
Age/Deterioration	6.60%	10.67%
R.O.W. Preventable	22.88%	14.10%

5.24.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.516
5.24.10	REPORTING YEAR (SAIDI)	1.944
5.24.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.011
5.24.12	REPORTING YEAR (SAIFI)	0.014

5.24.13 CORRECTIVE ACTION PLAN:

This feeder was flagged as exceeding the 5 yr rolling average due multiple tree and weather related outages

Action Plan:

Continue with current right of way program, also plan to implement a new coordination scheme to help reduce number and duration of permanent outages.

Circuit # 25

5.25.1	SUBSTATION NAME AND NUMBER	CARSON(11)
5.25.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.25.3	CIRCUIT NAME AND NUMBER	CARSON(11), Circuit 3, 1103
5.25.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.25.5	TOTAL CIRCUIT LENGTH (MILES)	83.6
5.25.6	CUSTOMER COUNT FOR THIS CIRCUIT	835
5.25.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.25.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	1.42%	0.81%
Equipment/Installation	3.67%	0.81%
Member/Public	0.08%	0.02%
R.O.W. Unpreventable	35.06%	30.27%
Scheduled	0.00%	0.00%
Unknown	4.42%	1.84%
Weather	53.59%	55.78%
Age/Deterioration	0.08%	0.07%
R.O.W. Preventable	0.25%	0.13%

5.25.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	3.476
5.25.10	REPORTING YEAR (SAIDI)	4.057
5.25.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.030
5.25.12	REPORTING YEAR (SAIFI)	0.020

5.25.13 CORRECTIVE ACTION PLAN:

This feeder exceeds the 5 yr rolling average due to multiple weather events, appearing mostly to be lightning caused.

Action Plan:

A recoordination scheme is going to be studied to try to minimize impacts due to weather events.

Circuit # 26

5.26.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT(10)
5.26.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.26.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT(10), Circuit 4, 1004
5.26.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.26.5	TOTAL CIRCUIT LENGTH (MILES)	10.6
5.26.6	CUSTOMER COUNT FOR THIS CIRCUIT	975
5.26.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.26.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	32.92%	22.13%
Equipment/Installation	0.93%	1.67%
Member/Public	10.25%	5.03%
R.O.W. Unpreventable	2.64%	1.59%
Scheduled	0.00%	0.00%
Unknown	23.14%	17.51%
Weather	14.13%	25.57%
Age/Deterioration	15.99%	26.49%
R.O.W. Preventable	0.00%	0.00%

5.26.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.083
5.26.10	REPORTING YEAR (SAIDI)	0.863
5.26.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.26.12	REPORTING YEAR (SAIFI)	0.011

5.26.13 CORRECTIVE ACTION PLAN:

Several animal related outages caused the indices to be higher than the 5 year rolling average. along with some old wire breaking, which was replaced.

Action Plan:

Continue with line inspection and wildlife guards as well as conductor replacements as appropriate. Plan to replace all remaining hydraulic reclosers with electronic on this feeder in order to increase response times and coordination in outages.

Circuit # 27

5.27.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT(10)
5.27.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.27.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT(10), Circuit 3, 1003
5.27.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.27.5	TOTAL CIRCUIT LENGTH (MILES)	15.4
5.27.6	CUSTOMER COUNT FOR THIS CIRCUIT	827
5.27.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.27.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	7.70%	2.76%
Equipment/Installation	0.00%	0.00%
Member/Public	44.15%	47.78%
R.O.W. Unpreventable	44.04%	46.03%
Scheduled	0.00%	0.00%
Unknown	2.13%	1.29%
Weather	1.91%	1.93%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.27.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.360
5.27.10	REPORTING YEAR (SAIDI)	2.647
5.27.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.27.12	REPORTING YEAR (SAIFI)	0.030

5.27.13 CORRECTIVE ACTION PLAN:

The majority of the SAIDI and SAIFI contributions came from an outage caused by a tree out of the Right of Way taking out the 3 phase opening the substation and removing all consumers from service while power was restored

Action Plan:
Continue with line inspection program and right of way programs.

Circuit # 28

5.28.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT(10)
5.28.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.28.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT(10), Circuit 2, 1002
5.28.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.28.5	TOTAL CIRCUIT LENGTH (MILES)	2.6
5.28.6	CUSTOMER COUNT FOR THIS CIRCUIT	157
5.28.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.28.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	100.00%	100.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.28.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.105
5.28.10	REPORTING YEAR (SAIDI)	0.087
5.28.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.28.12	REPORTING YEAR (SAIFI)	0.002

5.28.13 CORRECTIVE ACTION PLAN:

High wind during inclement weather caused the single outage on this feeder.

Action Plan:
None at this time, however, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 29

5.29.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT(10)
5.29.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.29.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT(10), Circuit 1, 1001
5.29.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.29.5	TOTAL CIRCUIT LENGTH (MILES)	4.1
5.29.6	CUSTOMER COUNT FOR THIS CIRCUIT	269
5.29.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.29.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	50.00%	23.63%
Age/Deterioration	50.00%	76.37%
R.O.W. Preventable	0.00%	0.00%

5.29.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.006
5.29.10	REPORTING YEAR (SAIDI)	0.007
5.29.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.29.12	REPORTING YEAR (SAIFI)	0.000

5.29.13 CORRECTIVE ACTION PLAN:

Two separate single customer outages were the cause of the SAIDI to be higher than the rolling five year average.

Action Plan:

None at this time, continue line inspection program.

Circuit # 30

5.30.1	SUBSTATION NAME AND NUMBER	GRIFFIN(9)
5.30.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.30.3	CIRCUIT NAME AND NUMBER	GRIFFIN(9), Circuit 4, 0904
5.30.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.30.5	TOTAL CIRCUIT LENGTH (MILES)	63.8
5.30.6	CUSTOMER COUNT FOR THIS CIRCUIT	572
5.30.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.30.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	11.72%	6.91%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	3.66%	2.82%
Weather	84.25%	88.80%
Age/Deterioration	0.24%	0.17%
R.O.W. Preventable	0.00%	0.00%

5.30.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.490
5.30.10	REPORTING YEAR (SAIDI)	1.388
5.30.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.30.12	REPORTING YEAR (SAIFI)	0.013

5.30.13 CORRECTIVE ACTION PLAN:

This circuit has alot of right of way that is at times hard to access in a rural part of the cooperative. Weather was the main cause of outages on this circuit which caused the SAIDI and SAIFI to be higher than the rolling five year average.

Action Plan:
Continue with Right of Way program to help ensure trees remaining out of the right of way and look at current lightning protection on this circuit.

Circuit # 31

5.31.1	SUBSTATION NAME AND NUMBER	GRIFFIN(9)
5.31.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.31.3	CIRCUIT NAME AND NUMBER	GRIFFIN(9), Circuit 3, 0903
5.31.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.31.5	TOTAL CIRCUIT LENGTH (MILES)	22.2
5.31.6	CUSTOMER COUNT FOR THIS CIRCUIT	216
5.31.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.31.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	33.33%	19.18%
Weather	50.00%	60.20%
Age/Deterioration	16.67%	20.61%
R.O.W. Preventable	0.00%	0.00%

5.31.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.402
5.31.10	REPORTING YEAR (SAIDI)	0.225
5.31.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.31.12	REPORTING YEAR (SAIFI)	0.003

5.31.13 CORRECTIVE ACTION PLAN:

Mostly weather contributed to outages for the 2017 year along with one wire that pulled out of a sleeve in an isolated incident.

Action Plan:

Plans are in place to review coordination on this feeder to improve outage sizes and durations.

Circuit # 32

5.32.1	SUBSTATION NAME AND NUMBER	GRIFFIN(9)
5.32.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.32.3	CIRCUIT NAME AND NUMBER	GRIFFIN(9), Circuit 2, 0902
5.32.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.32.5	TOTAL CIRCUIT LENGTH (MILES)	36.6
5.32.6	CUSTOMER COUNT FOR THIS CIRCUIT	338
5.32.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.32.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	7.82%	10.18%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	60.55%	29.46%
Scheduled	0.00%	0.00%
Unknown	6.00%	7.65%
Weather	25.64%	52.71%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.32.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.704
5.32.10	REPORTING YEAR (SAIDI)	0.546
5.32.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.006
5.32.12	REPORTING YEAR (SAIFI)	0.009

5.32.13 CORRECTIVE ACTION PLAN:

There were several outages caused by high winds and lightning during a series of storms in this area.

Action Plan:

There are no plans at this time. However, OEC will continue the existing line inspection and RO W maintenance programs.

Circuit # 33

5.33.1	SUBSTATION NAME AND NUMBER	GRIFFIN(9)
5.33.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.33.3	CIRCUIT NAME AND NUMBER	GRIFFIN(9), Circuit 1, 0901
5.33.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.33.5	TOTAL CIRCUIT LENGTH (MILES)	68.8
5.33.6	CUSTOMER COUNT FOR THIS CIRCUIT	797
5.33.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.33.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.64%	0.30%
Member/Public	18.21%	11.76%
R.O.W. Unpreventable	50.00%	66.78%
Scheduled	0.00%	0.00%
Unknown	3.04%	0.95%
Weather	17.41%	7.62%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.33.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.310
5.33.10	REPORTING YEAR (SAIDI)	1.996
5.33.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.011
5.33.12	REPORTING YEAR (SAIFI)	0.010

5.33.13 CORRECTIVE ACTION PLAN:

There were several outages caused by high winds and lightning during a series of storms in this area.

Action Plan:

There are no plans at this time. However, OEC will continue the existing line inspection and ROW maintenance programs.

Circuit # 34

5.34.1	SUBSTATION NAME AND NUMBER	BULLITTSVILLE(8)
5.34.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.34.3	CIRCUIT NAME AND NUMBER	BULLITTSVILLE(8), Circuit 4, 0804
5.34.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.34.5	TOTAL CIRCUIT LENGTH (MILES)	5.5
5.34.6	CUSTOMER COUNT FOR THIS CIRCUIT	47
5.34.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.34.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	80.36%	77.82%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	19.64%	22.18%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.34.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.014
5.34.10	REPORTING YEAR (SAIDI)	0.333
5.34.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.34.12	REPORTING YEAR (SAIFI)	0.001

5.34.13 CORRECTIVE ACTION PLAN:

An incident where a truck struck a pole was the major cause of the SAIDI and SAIFI being higher than the 5 year rolling average.

Action Plan:

None at this time, however, Owen Electric adheres to NESC and RUS codes to ensure safe and reliable construction.

Circuit # 35

5.35.1	SUBSTATION NAME AND NUMBER	BULLITTSVILLE(8)
5.35.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.35.3	CIRCUIT NAME AND NUMBER	BULLITTSVILLE(8), Circuit 1, 0801
5.35.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.35.5	TOTAL CIRCUIT LENGTH (MILES)	9.9
5.35.6	CUSTOMER COUNT FOR THIS CIRCUIT	276
5.35.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

5.35.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	5.28%	0.69%
Equipment/Installation	0.00%	0.00%
Member/Public	91.42%	97.93%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	3.30%	1.38%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.35.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.158
5.35.10	REPORTING YEAR (SAIDI)	1.586
5.35.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.35.12	REPORTING YEAR (SAIFI)	0.005

5.35.13 CORRECTIVE ACTION PLAN:

A truck struck the CATV line, which as a result caused damage to Owen Electric lines causing an outage, which was the main contributor to the SAIDI and SAIFI being higher than the average rolling five years.

Action Plan:

No Action at this time, however, Owen Electric adheres to NESC and RUS codes to ensure safe and reliable construction.

Circuit # 36

5.36.1	SUBSTATION NAME AND NUMBER	PENN(7)
5.36.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.36.3	CIRCUIT NAME AND NUMBER	PENN(7), Circuit 2, 0702
5.36.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.36.5	TOTAL CIRCUIT LENGTH (MILES)	109.6
5.36.6	CUSTOMER COUNT FOR THIS CIRCUIT	747
5.36.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

5.36.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	39.77%	26.82%
Equipment/Installation	0.00%	0.00%
Member/Public	15.40%	8.05%
R.O.W. Unpreventable	1.15%	1.52%
Scheduled	4.14%	1.15%
Unknown	17.93%	7.66%
Weather	7.13%	2.76%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	4.60%	2.57%

5.36.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.860
5.36.10	REPORTING YEAR (SAIDI)	1.098
5.36.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.010
5.36.12	REPORTING YEAR (SAIFI)	0.007

5.36.13 CORRECTIVE ACTION PLAN:

There were several types of outages on this feeder, which is rural and relatively long. Wildlife was the main contributor however and caused multiple outages.

Action Plan:
Review lines wildlife protection scheme to see if further protection is needed in certain areas.

Circuit # 37

5.37.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN(5)
5.37.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.37.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN(5), Circuit 7, 0507
5.37.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.37.5	TOTAL CIRCUIT LENGTH (MILES)	57.0
5.37.6	CUSTOMER COUNT FOR THIS CIRCUIT	969
5.37.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.37.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	20.58%	13.26%
Equipment/Installation	10.29%	2.51%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	34.08%	28.86%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	34.41%	53.71%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.32%	0.47%

5.37.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.058
5.37.10	REPORTING YEAR (SAIDI)	0.370
5.37.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.37.12	REPORTING YEAR (SAIFI)	0.005

5.37.13 CORRECTIVE ACTION PLAN:

Weather was the major contributor to outages on this circuit along with some additional construction work and trees falling into the lines.

Action Plan:
 The right of way was cut in late 2017, which will aid in future tree outages as well as changing the hydraulic reclosers to new electronic reclosers.

Circuit # 38

5.38.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN(5)
5.38.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.38.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN(5), Circuit 3, 0503
5.38.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.38.5	TOTAL CIRCUIT LENGTH (MILES)	73.7
5.38.6	CUSTOMER COUNT FOR THIS CIRCUIT	682
5.38.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.38.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.44%	0.84%
Equipment/Installation	6.00%	11.53%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	5.93%	15.78%
Scheduled	0.00%	0.00%
Unknown	42.36%	36.92%
Weather	45.14%	33.92%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.38.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.941
5.38.10	REPORTING YEAR (SAIDI)	1.045
5.38.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.38.12	REPORTING YEAR (SAIFI)	0.026

5.38.13 CORRECTIVE ACTION PLAN:

This feeder exceed the 5 yr rolling average multiple weather related events that caused several outages.

Action Plan:
The right of way will be cut in 2018, there is no other action planned on this feeder.

Circuit # 39

5.39.1	SUBSTATION NAME AND NUMBER	MUNK(4)
5.39.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.39.3	CIRCUIT NAME AND NUMBER	MUNK(4), Circuit 6, 0406
5.39.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.39.5	TOTAL CIRCUIT LENGTH (MILES)	7.0
5.39.6	CUSTOMER COUNT FOR THIS CIRCUIT	69
5.39.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.39.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	66.09%	40.78%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.39.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.005
5.39.10	REPORTING YEAR (SAIDI)	0.487
5.39.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.39.12	REPORTING YEAR (SAIFI)	0.002

5.39.13 CORRECTIVE ACTION PLAN:

Lightning was the cause of this feeders higher than rolling 5 year average of SAIDI and SAIFI

Action Plan:
Review over voltage protection plan on this feeder.

Circuit # 40

5.40.1	SUBSTATION NAME AND NUMBER	MUNK(4)
5.40.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.40.3	CIRCUIT NAME AND NUMBER	MUNK(4), Circuit 3, 0403
5.40.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.40.5	TOTAL CIRCUIT LENGTH (MILES)	39.2
5.40.6	CUSTOMER COUNT FOR THIS CIRCUIT	431
5.40.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.40.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.16%	0.04%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	12.44%	10.24%
Scheduled	0.00%	0.00%
Unknown	9.76%	6.80%
Weather	49.92%	56.09%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	27.24%	23.21%

5.40.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.835
5.40.10	REPORTING YEAR (SAIDI)	1.636
5.40.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.40.12	REPORTING YEAR (SAIFI)	0.010

5.40.13 CORRECTIVE ACTION PLAN:

Inclement weather was the major cause of outages in addition to having Right of Way Problems

Action Plan:
A circuit tree trim is scheduled in 2018 which will help reduce outages in both bad weather and right of way outages.

Circuit # 41

5.41.1	SUBSTATION NAME AND NUMBER	GRANTSLICK(3)
5.41.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.41.3	CIRCUIT NAME AND NUMBER	GRANTSLICK(3), Circuit 4, 0304
5.41.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.41.5	TOTAL CIRCUIT LENGTH (MILES)	62.1
5.41.6	CUSTOMER COUNT FOR THIS CIRCUIT	631
5.41.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.41.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	1.01%	0.77%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	16.99%	4.33%
Scheduled	0.00%	0.00%
Unknown	5.26%	6.47%
Weather	74.92%	86.74%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	1.82%	1.70%

5.41.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.064
5.41.10	REPORTING YEAR (SAIDI)	1.361
5.41.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.41.12	REPORTING YEAR (SAIFI)	0.016

5.41.13 CORRECTIVE ACTION PLAN:

Inclement weather, lightning being the most identified cause was the major contributor to SAIFI and SAIDI

Action Plan:

Right of way is planned to be cut in 2018, also will review arrestor placement to see if any changes can be made that would help reduce lightning outages.

Circuit # 42

5.42.1	SUBSTATION NAME AND NUMBER	BANKLICK(2)
5.42.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.42.3	CIRCUIT NAME AND NUMBER	BANKLICK(2), Circuit 6, 0206
5.42.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.42.5	TOTAL CIRCUIT LENGTH (MILES)	16.7
5.42.6	CUSTOMER COUNT FOR THIS CIRCUIT	955
5.42.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.42.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.22%	0.16%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.43%	2.13%
Weather	99.35%	97.71%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.42.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.031
5.42.10	REPORTING YEAR (SAIDI)	0.500
5.42.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.42.12	REPORTING YEAR (SAIFI)	0.015

5.42.13 CORRECTIVE ACTION PLAN:

During an inclement weather event an ash tree fell on the line causing nearly all the SAIDI and SAIFI contributions for the year.

Action Plan:
 Right of way was called in and cleaned up the area, also the entire right of way is scheduled to be cut in 2018

Circuit # 43

5.43.1	SUBSTATION NAME AND NUMBER	BOONE(1)
5.43.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.43.3	CIRCUIT NAME AND NUMBER	BOONE(1), Circuit 5, 0105
5.43.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.43.5	TOTAL CIRCUIT LENGTH (MILES)	31.2
5.43.6	CUSTOMER COUNT FOR THIS CIRCUIT	1744
5.43.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.43.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	0.61%	0.14%
Equipment/Installation	0.61%	0.46%
Member/Public	83.01%	84.37%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	4.70%	2.48%
Weather	7.43%	10.59%
Age/Deterioration	2.93%	1.78%
R.O.W. Preventable	0.71%	0.19%

5.43.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.687
5.43.10	REPORTING YEAR (SAIDI)	5.545
5.43.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.028
5.43.12	REPORTING YEAR (SAIFI)	0.033

5.43.13 CORRECTIVE ACTION PLAN:

An outage caused by the public temporarily took nearly 1650 members offline. The pole fed a large section of underground and multiple switching had to be done while the pole was fixed in order to get members power.

Action Plan:
 Nothing at this time, however Owen Electric considers all NESC and RUS codes in design to help consturct a safe and robust system.

Circuit # 44

5.44.1	SUBSTATION NAME AND NUMBER	BOONE(1)
5.44.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.44.3	CIRCUIT NAME AND NUMBER	BOONE(1), Circuit 1, 0101
5.44.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.44.5	TOTAL CIRCUIT LENGTH (MILES)	30.6
5.44.6	CUSTOMER COUNT FOR THIS CIRCUIT	355
5.44.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

5.44.23 LIST OF OUTAGE CAUSES FOR CIRCUIT ALONG WITH PERCENTAGE OF TOTAL OUTAGE NUMBERS REPRESENTED BY EACH CAUSE

Outage Cause	SAIFI Contribution	SAIDI Contribution
Power Supplier	0.00%	0.00%
Birds/Animals	21.59%	8.99%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	1.10%	0.55%
Scheduled	3.74%	4.22%
Unknown	15.20%	8.49%
Weather	37.22%	51.03%
Age/Deterioration	1.32%	1.75%
R.O.W. Preventable	19.82%	24.98%

5.44.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.566
5.44.10	REPORTING YEAR (SAIDI)	1.033
5.44.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.44.12	REPORTING YEAR (SAIFI)	0.007

5.44.13 CORRECTIVE ACTION PLAN:

Weather and Right of Way problems were the cause of SAIDI and SAIFI being higher than the rolling five year average

Action plan:
 Right of way was cut in 2017, which will help with right of way issues and line inspection will continue as normal.

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

Additional pages may be attached as necessary

SECTION 6: VEGETATION MANAGEMENT PLAN REVIEW

INCLUDE CURRENT VEGETATION MANAGEMENT PLAN

Additional pages may be attached as necessary

OEC'S Vegetation Management Plan, depending on budget and need, is an aggressive 4-yr. trim cycle covering our operating territory. OEC maintains a 2-yr intermediate trim cycle on all three-phase line extending from the substation to at least the first set of breakers and generally includes all of the three-phase line.

In 2015 we developed a Dead Ash Tree Policy. Additional machinery and manpower were brought on board for what is expected to be a 2-yr. eradication process of all ash trees in OEC rights-of-ways. Three phase lines will be cleared of ash trees first, then an evaluation will be done on single phase lines, then single phase taps.

Owen Electric employs a comprehensive IVM program using manual, mechanical, and chemical methods to control problematic trees and brush based on environmental impact, safety, effectiveness, and cost. Our herbicide program is a 4-yr cycle also, allowing OEC to apply the proper herbicides to a circuit that was trimmed the previous year.

Our vegetation management plan is fluid and can be adjusted easily to allow for rainfall, drought, and differences in soil fertility and soil structure. If a circuit needs attention sooner than scheduled, or later, it can easily be done.

KENTUCKY PUBLIC SERVICE COMMISSION

SECTION 7: UTILITY COMMENTS

During the course of 2017 OEC continued to support several initiatives designed to minimize the extent of outages and speed in the restoration of outages caused by weather. Owen Electric's Feeder Hardening program is in its seventh year. OEC has also implemented an ongoing over-current protection review of each feeder prioritized by operational feedback and length of feeder. These programs will continue into the 2018-2019 Construction Work Plan.

We continue to operate two self healing sites to provide backup power to critical Sanitation District plants.

OEC, in cooperation with EKPC, has completed a new substation in our southern territory that reduced exposure on a long rural 25kv circuits which should improve reliability significantly for our membership in this area of our service territory. 2017 was the first full operating year of the LongLick Substation.

OEC continues working on future plans to address other feeders with plans for new substations that will shorten the feeder lengths and provide improvements in reliability. Until these substations can be implemented, initiatives such as feeder hardening, focused ROW clearing, and increased sectionalizing will continue to be considered.

A program to remove hydraulic reclosers and replace with electronic as well as increasing the number of new sectionalizing studies a year has also been implemented.