


OWEN Electric

A Touchstone Energy[®] Cooperative 

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COMMISSION

April 29, 2016

Mr. Aaron Greenwell
Deputy Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
P.O. Box 615
Frankfort, Kentucky 40602-0615

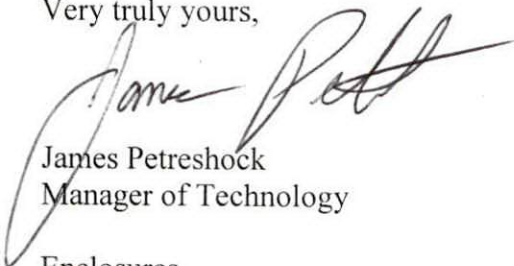
Re: Administrative Case No. 2011-00450

Dear Mr. Greenwell:

Please find enclosed for filing with the Commission in the above-referenced case, an original and an electronic copy of the 2015 Annual Reliability Report for Owen Electric Cooperative, Inc.

Please contact me if you have questions.

Very truly yours,


James Petreshock
Manager of Technology

Enclosures

KENTUCKY PUBLIC SERVICE COMMISSION

Electric Distribution Utility Annual Reliability Report

SECTION 1: CONTACT INFORMATION

UTILITY NAME	<u>Owen Electric Cooperative</u>
REPORT PREPARED BY	<u>James Petreshock</u>
E-MAIL ADDRESS OF PREPARER	<u>jpetreshock@owenelectric.com</u>
PHONE NUMBER OF PREPARER	<u>(502) 563-3492</u>

SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	<u>2015</u>
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SECTION 3: MAJOR EVENT DAYS

T_{MED}	<u>10.589</u>
FIRST DATE USED TO DETERMINE T_{MED}	<u>1-Jan-2010</u>
LAST DATE USED TO DETERMINE T_{MED}	<u>31-Dec-2014</u>
NUMBER OF MED IN REPORT YEAR	<u>1</u>

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

SECTION 4: SYSTEM RELIABILITY INFORMATION AND RESULTS

System-wide Information			
TOTAL CUSTOMERS	<u>59,409</u>	TOTAL CIRCUITS	<u>123</u>
Excluding MED			
5 YEAR AVERAGE		REPORTING YEAR	
SAIDI	<u>135.65</u>	SAIDI	<u>116.00</u>
SAIFI	<u>1.365</u>	SAIFI	<u>1.56</u>
Including MED			
5 YEAR AVERAGE		REPORTING YEAR	
SAIDI	<u>187.326</u>	SAIDI	<u>157.59</u>
SAIFI	<u>1.516</u>	SAIFI	<u>1.56</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

Circuit # 1

5.1.1	SUBSTATION NAME AND NUMBER	KEITH II, Sub No. 58
5.1.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Owen
5.1.3	CIRCUIT NAME AND NUMBER	KEITH II, Circuit 5, 5805
5.1.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.1.5	TOTAL CIRCUIT LENGTH (MILES)	13.5
5.1.6	CUSTOMER COUNT FOR THIS CIRCUIT	1
5.1.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	100.00%	100.00%
Unknown	0.00%	0.00%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.1.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.001
5.1.10	REPORTING YEAR (SAIDI)	0.009
5.1.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.1.12	REPORTING YEAR (SAIFI)	0.000

5.1.13 CORRECTIVE ACTION PLAN:

There was a scheduled outage for a single customer for line relocation by construction crews.

Action Plan

None at this time. This industrial member had a diesel generator for operating power during this outage.

Circuit # 2

5.2.1	SUBSTATION NAME AND NUMBER	BRISTOW II, Sub No. 56
5.2.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.2.3	CIRCUIT NAME AND NUMBER	BRISTOW II, Circuit 8, 5608
5.2.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.2.5	TOTAL CIRCUIT LENGTH (MILES)	9.2
5.2.6	CUSTOMER COUNT FOR THIS CIRCUIT	709
5.2.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	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	100.00%	100.00%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.2.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.182
5.2.10	REPORTING YEAR (SAIDI)	0.250
5.2.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.2.12	REPORTING YEAR (SAIFI)	0.002

5.2.13 CORRECTIVE ACTION PLAN:

There was a transformer failure servicing a large number of members.

Action Plan
Continue line inspection program and maintenance program to inspect U/G transformers.

Circuit # 3

5.3.1	SUBSTATION NAME AND NUMBER	RICHARDSON II, Sub No. 55
5.3.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.3.3	CIRCUIT NAME AND NUMBER	RICHARDSON II, Circuit 4, 5504
5.3.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.3.5	TOTAL CIRCUIT LENGTH (MILES)	7.7
5.3.6	CUSTOMER COUNT FOR THIS CIRCUIT	461
5.3.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	6.92%	14.55%
Equipment/Installation	6.63%	18.93%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.59%	1.81%
Unknown	19.15%	50.71%
Weather	66.72%	14.01%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.3.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.631
5.3.10	REPORTING YEAR (SAIDI)	0.272
5.3.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.3.12	REPORTING YEAR (SAIFI)	0.011

5.3.13 CORRECTIVE ACTION PLAN:

There was a feeder level outage caused by a large yard tree that fell across the 3ph main line.

Action Plan
 Continue line inspection program and ROW maintenance program. Continue ROW hot spot program to address Emerald Ash Borer problem.

Circuit # 4

5.4.1	SUBSTATION NAME AND NUMBER	DURO II, Sub No. 54
5.4.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.4.3	CIRCUIT NAME AND NUMBER	DURO II, Circuit 3, 5403
5.4.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.4.5	TOTAL CIRCUIT LENGTH (MILES)	2.4
5.4.6	CUSTOMER COUNT FOR THIS CIRCUIT	414
5.4.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	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%

5.4.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.140
5.4.10	REPORTING YEAR (SAIDI)	0.211
5.4.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.4.12	REPORTING YEAR (SAIFI)	0.007

5.4.13 CORRECTIVE ACTION PLAN:

There were three weather related outages; extreme cold transformer overload, lightning and high winds knocking down a tree into the 3ph main line.

Action Plan

There are no plans at this time besides continuing the existing line inspection and ROW maintenance programs.

Circuit # 5

5.5.1	SUBSTATION NAME AND NUMBER	DURO II, Sub No. 54
5.5.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.5.3	CIRCUIT NAME AND NUMBER	DURO II, Circuit 2, 5402
5.5.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.5.5	TOTAL CIRCUIT LENGTH (MILES)	12.8
5.5.6	CUSTOMER COUNT FOR THIS CIRCUIT	619
5.5.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	33.33%	18.33%
Equipment/Installation	46.20%	68.42%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	1.17%	0.82%
Unknown	16.37%	8.27%
Weather	2.92%	4.16%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.5.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.156
5.5.10	REPORTING YEAR (SAIDI)	0.255
5.5.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.5.12	REPORTING YEAR (SAIFI)	0.003

5.5.13 CORRECTIVE ACTION PLAN:

There were two large outages due to a bad lightning arrester and an OCR. Without this outage, which was unpreventable, this circuit would have been below the limit for reporting.

Action Plan:

No action at this time.

Circuit # 6

5.6.1	SUBSTATION NAME AND NUMBER	SMITH II, Sub No. 52
5.6.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.6.3	CIRCUIT NAME AND NUMBER	SMITH II, Circuit 1, 5201
5.6.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.6.5	TOTAL CIRCUIT LENGTH (MILES)	6.0
5.6.6	CUSTOMER COUNT FOR THIS CIRCUIT	111
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	82.61%	92.86%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	17.39%	7.14%
Unknown	0.00%	0.00%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.6.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.068
5.6.10	REPORTING YEAR (SAIDI)	0.075
5.6.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.6.12	REPORTING YEAR (SAIFI)	0.001

5.6.13 CORRECTIVE ACTION PLAN:

The primary cause of this feeder being flagged as exceeding the 5yr reliability indices was a long duration outage due to a squirrel making contact on transformer. The extended nature of the outage was due to the difficulty locating the cause.

Action Plan:

Continue to evaluate construction designs.

Circuit # 7

5.7.1	SUBSTATION NAME AND NUMBER	GRANTSLICK II, Sub No. 51
5.7.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.7.3	CIRCUIT NAME AND NUMBER	GRANTSLICK II, Circuit 1, 5101
5.7.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.7.5	TOTAL CIRCUIT LENGTH (MILES)	133.4
5.7.6	CUSTOMER COUNT FOR THIS CIRCUIT	1582
5.7.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	0.69%	0.23%
Equipment/Installation	11.30%	16.85%
Member/Public	0.80%	0.45%
R.O.W. Unpreventable	11.68%	15.53%
Scheduled	3.16%	1.23%
Unknown	7.45%	6.04%
Weather	64.26%	58.71%
Age/Deterioration	0.41%	0.35%
R.O.W. Preventable	0.26%	0.60%

5.7.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	6.166
5.7.10	REPORTING YEAR (SAIDI)	14.697
5.7.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.037
5.7.12	REPORTING YEAR (SAIFI)	0.102

5.7.13 CORRECTIVE ACTION PLAN:

This feeder was flagged for exceeding the 5yr average performance due to a feeder outage caused by a pole fire that was caused by a lightning strike. This outage lasted nearly 8 hours.

Action Plan:
 There are no plans at this time for corrective action. However, OEC continues to work with EKPC to construct new substations whenever reliability of load justifications warrant.

Circuit # 8

5.8.1	SUBSTATION NAME AND NUMBER	BELLEVIEW, Sub No. 27
5.8.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.8.3	CIRCUIT NAME AND NUMBER	BELLEVIEW, Circuit 3, 2703
5.8.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.8.5	TOTAL CIRCUIT LENGTH (MILES)	18.6
5.8.6	CUSTOMER COUNT FOR THIS CIRCUIT	164
5.8.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	1.74%	1.00%
Equipment/Installation	34.20%	17.87%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.22%	0.11%
Weather	50.98%	75.59%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	12.85%	5.44%

5.8.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.072
5.8.10	REPORTING YEAR (SAIDI)	1.242
5.8.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.8.12	REPORTING YEAR (SAIFI)	0.008

5.8.13 CORRECTIVE ACTION PLAN:

Two outages resulted in this feeder being flagged as exceeding the 5yr reliability indices. One was due to an early morning outage caused by high winds which resulted in both phase and neutral conductors being knocked to the ground. The second was due to another early morning outage caused by high winds knocking a tree from outside the ROW into the 3ph main line.

Action Plan:

Continue to follow the current line inspection program and ROW trimming program.

Circuit # 9

5.9.1	SUBSTATION NAME AND NUMBER	RICHWOOD, Sub No. 26
5.9.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.9.3	CIRCUIT NAME AND NUMBER	RICHWOOD, Circuit 5, 2605
5.9.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.9.5	TOTAL CIRCUIT LENGTH (MILES)	9.5
5.9.6	CUSTOMER COUNT FOR THIS CIRCUIT	733
5.9.7	DATE OF LAST CIRCUIT TRIM (VM)	2011

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	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%

5.9.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.309
5.9.10	REPORTING YEAR (SAIDI)	0.436
5.9.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.9.12	REPORTING YEAR (SAIFI)	0.003

5.9.13 CORRECTIVE ACTION PLAN:

During a period of warm weather a series of underground elbows failed resulting in this feeder exceeding the 5yr rolling average performance.

Action Plan:

The underground elbows were shipped back to the manufacturer for analysis. Their report indicated that there were manufacturing defects within this equipment.

Circuit # 10

5.10.1	SUBSTATION NAME AND NUMBER	RICHWOOD, Sub No. 26
5.10.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.10.3	CIRCUIT NAME AND NUMBER	RICHWOOD, Circuit 4, 2604
5.10.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.10.5	TOTAL CIRCUIT LENGTH (MILES)	15.9
5.10.6	CUSTOMER COUNT FOR THIS CIRCUIT	461
5.10.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	0.19%	0.49%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	4.60%	6.14%
Scheduled	86.59%	11.57%
Unknown	0.19%	3.29%
Weather	0.77%	2.57%
Age/Deterioration	0.57%	1.11%
R.O.W. Preventable	7.09%	74.82%

5.10.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.418
5.10.10	REPORTING YEAR (SAIDI)	0.132
5.10.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.10.12	REPORTING YEAR (SAIFI)	0.009

5.10.13 CORRECTIVE ACTION PLAN:

There was a scheduled outage on this feeder that resulted in the worse performance than the previous 5yr average. In this outage a limb from a large tree was brushing the phase and the circuit needed to be de-energized to safely remove the tree.

Action Plan:

Continue the current line inspection and ROW maintenance programs,

Circuit # 11

5.11.1	SUBSTATION NAME AND NUMBER	STERLING, Sub No. 25
5.11.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.11.3	CIRCUIT NAME AND NUMBER	STERLING, Circuit 2, 2502
5.11.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.11.5	TOTAL CIRCUIT LENGTH (MILES)	0.1
5.11.6	CUSTOMER COUNT FOR THIS CIRCUIT	1
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	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	100.00%	100.00%
Unknown	0.00%	0.00%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.11.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.001
5.11.10	REPORTING YEAR (SAIDI)	0.005
5.11.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.11.12	REPORTING YEAR (SAIFI)	0.000

5.11.13 CORRECTIVE ACTION PLAN:

This customer requested an outage for maintenance of their equipment.

Action Plan:
No Action Necessary.

Circuit # 12

5.12.1	SUBSTATION NAME AND NUMBER	STERLING, Sub No. 25
5.12.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.12.3	CIRCUIT NAME AND NUMBER	STERLING, Circuit 1, 2501
5.12.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.12.5	TOTAL CIRCUIT LENGTH (MILES)	43.7
5.12.6	CUSTOMER COUNT FOR THIS CIRCUIT	604
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	2.93%	1.08%
Equipment/Installation	14.29%	13.18%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	7.08%	8.15%
Scheduled	0.19%	0.10%
Unknown	40.43%	24.73%
Weather	18.94%	41.80%
Age/Deterioration	12.37%	9.14%
R.O.W. Preventable	3.76%	1.83%

5.12.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	6.889
5.12.10	REPORTING YEAR (SAIDI)	4.819
5.12.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.022
5.12.12	REPORTING YEAR (SAIFI)	0.036

5.12.13 CORRECTIVE ACTION PLAN:

Multiple unknown outages.

Action Plan:

This circuit covers rugged and rural terrain in Gallatin county which can be difficult to access under good conditions. We will continue our line inspection and maintenance programs.

Circuit # 13

5.13.1	SUBSTATION NAME AND NUMBER	BURLINGTON, Sub No. 24
5.13.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.13.3	CIRCUIT NAME AND NUMBER	BURLINGTON, Circuit 4, 2404
5.13.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.13.5	TOTAL CIRCUIT LENGTH (MILES)	15.8
5.13.6	CUSTOMER COUNT FOR THIS CIRCUIT	386
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	7.81%	7.19%
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	73.24%	69.25%
Weather	6.05%	7.29%
Age/Deterioration	10.35%	11.94%
R.O.W. Preventable	2.54%	4.34%

5.13.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.245
5.13.10	REPORTING YEAR (SAIDI)	0.474
5.13.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.13.12	REPORTING YEAR (SAIFI)	0.009

5.13.13 CORRECTIVE ACTION PLAN:

There was a feeder outage that affected all 386 members which resulted in this feeder exceeding the 5 yrs SAIFI index. There was no cause identified with this outage and it was determined that the outage may have been caused by lightning as there were storms in the area at the time.

Action Plan:
Continue the current line inspection and ROW maintenance programs, and where possible expand over-voltage protection.

Circuit # 14

5.14.1	SUBSTATION NAME AND NUMBER	HEBRON, Sub No. 22
5.14.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.14.3	CIRCUIT NAME AND NUMBER	HEBRON, Circuit 4, 2204
5.14.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.14.5	TOTAL CIRCUIT LENGTH (MILES)	30.7
5.14.6	CUSTOMER COUNT FOR THIS CIRCUIT	678
5.14.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	0.12%	7.04%
Birds/Animals	4.96%	10.22%
Equipment/Installation	75.18%	12.43%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	1.18%	7.94%
Scheduled	0.00%	0.00%
Unknown	0.47%	1.24%
Weather	14.54%	52.64%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	3.55%	8.48%

5.14.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.766
5.14.10	REPORTING YEAR (SAIDI)	0.583
5.14.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.14.12	REPORTING YEAR (SAIFI)	0.015

5.14.13 CORRECTIVE ACTION PLAN:

There was a large outage as a result of a bad underground terminal block.

Action Plan:
Continue the current line inspection and ROW maintenance programs as well as the underground program to inspect underground transformers and switch cabinets. OEC also conducts IR imaging to detect hot spots that may lead to premature equipment failures.

Circuit # 15

5.15.1	SUBSTATION NAME AND NUMBER	HEBRON, Sub No. 22
5.15.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.15.3	CIRCUIT NAME AND NUMBER	HEBRON, Circuit 3, 2203
5.15.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.15.5	TOTAL CIRCUIT LENGTH (MILES)	27.5
5.15.6	CUSTOMER COUNT FOR THIS CIRCUIT	1507
5.15.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	0.69%	0.98%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	1.39%	0.47%
Unknown	3.60%	6.17%
Weather	93.62%	89.15%
Age/Deterioration	0.13%	0.96%
R.O.W. Preventable	0.57%	2.27%

5.15.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.706
5.15.10	REPORTING YEAR (SAIDI)	1.047
5.15.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.013
5.15.12	REPORTING YEAR (SAIFI)	0.027

5.15.13 CORRECTIVE ACTION PLAN:

There were several lightning related outages as a result of storms moving through this area of our territory which contributed to the circuit indices exceeding the 5 yr rolling averages.

Action Plan:

Continue with the existing lightning protection program of adding lightning arrestors where applicable. Continue existing line inspection and maintenance programs.

Circuit # 16

5.16.1	SUBSTATION NAME AND NUMBER	NOEL, Sub No. 21
5.16.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.16.3	CIRCUIT NAME AND NUMBER	NOEL, Circuit 4, 2104
5.16.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.16.5	TOTAL CIRCUIT LENGTH (MILES)	37.6
5.16.6	CUSTOMER COUNT FOR THIS CIRCUIT	516
5.16.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	4.63%	3.45%
Equipment/Installation	6.69%	12.06%
Member/Public	2.19%	1.79%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	7.21%	3.51%
Unknown	0.39%	0.35%
Weather	78.51%	78.56%
Age/Deterioration	0.39%	0.27%
R.O.W. Preventable	0.00%	0.00%

5.16.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.913
5.16.10	REPORTING YEAR (SAIDI)	1.074
5.16.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.009
5.16.12	REPORTING YEAR (SAIFI)	0.013

5.16.13 CORRECTIVE ACTION PLAN:

High winds resulted in a neutral conductor breaking off a 3ph primary pole. This resulted in a substation outage that affected all 516 members.

Action Plan:

Continue with the existing line inspections program and maintenance program. As part of our 3ph circuit main line hardening program we identify key spans that are longer than the average circuit spans and jobs are requested to install in-line poles to shorten spans and improve circuit resiliency.

Circuit # 17

5.17.1	SUBSTATION NAME AND NUMBER	GALLATIN, Sub No. 18
5.17.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.17.3	CIRCUIT NAME AND NUMBER	GALLATIN, Circuit 3, 1803
5.17.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.17.5	TOTAL CIRCUIT LENGTH (MILES)	7.1
5.17.6	CUSTOMER COUNT FOR THIS CIRCUIT	58
5.17.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	83.33%	84.18%
Weather	16.67%	15.82%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.17.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.004
5.17.10	REPORTING YEAR (SAIDI)	0.012
5.17.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.17.12	REPORTING YEAR (SAIFI)	0.000

5.17.13 CORRECTIVE ACTION PLAN:

An outage of unknown cause resulted in this circuit being flagged as exceeding the 5 yr rolling average for SAIDI.

Action Plan:
 The service technician responding to this outage requested that the engineering department analyze this feeder tap and determine if the fuse sizing was correct. Engineering recommended increasing the fuse size to prevent outages from load.

Circuit # 18

5.18.1	SUBSTATION NAME AND NUMBER	SMOOT, Sub No. 16
5.18.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.18.3	CIRCUIT NAME AND NUMBER	SMOOT, Circuit 3, 1603
5.18.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.18.5	TOTAL CIRCUIT LENGTH (MILES)	5.0
5.18.6	CUSTOMER COUNT FOR THIS CIRCUIT	301
5.18.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	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	100.00%	100.00%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.18.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.005
5.18.10	REPORTING YEAR (SAIDI)	0.045
5.18.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.18.12	REPORTING YEAR (SAIFI)	0.005

5.18.13 CORRECTIVE ACTION PLAN:

This outage was caused by a phasing discrepancy between the field and maps during a construction job.

Action Plan:

Phasing sticks were used to determine phasing and phasing tags on the mapping system updated to correctly reflect that in the field.

Circuit # 19

5.19.1	SUBSTATION NAME AND NUMBER	SMOOT, Sub No. 16
5.19.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.19.3	CIRCUIT NAME AND NUMBER	SMOOT, Circuit 2, 1602
5.19.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.19.5	TOTAL CIRCUIT LENGTH (MILES)	18.7
5.19.6	CUSTOMER COUNT FOR THIS CIRCUIT	1344
5.19.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

5.19.23 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	5.58%	4.36%
Equipment/Installation	0.48%	0.94%
Member/Public	89.65%	90.54%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	1.43%	1.30%
Weather	2.45%	2.73%
Age/Deterioration	0.41%	0.12%
R.O.W. Preventable	0.00%	0.00%

5.19.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.548
5.19.10	REPORTING YEAR (SAIDI)	1.871
5.19.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.013
5.19.12	REPORTING YEAR (SAIFI)	0.025

5.19.13 CORRECTIVE ACTION PLAN:

This circuit exceeded the 5 yr rolling outage due to a drunk driver hitting a 3ph mainline pole which resulted in a feeder outage.

Action Plan:

No action was required for this feeder. However, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 20

5.20.1	SUBSTATION NAME AND NUMBER	SMITH, Sub No. 15
5.20.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.20.3	CIRCUIT NAME AND NUMBER	SMITH, Circuit 5, 1505
5.20.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.20.5	TOTAL CIRCUIT LENGTH (MILES)	8.2
5.20.6	CUSTOMER COUNT FOR THIS CIRCUIT	102
5.20.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	4.62%	4.71%
Scheduled	4.62%	3.39%
Unknown	0.00%	0.00%
Weather	65.90%	63.16%
Age/Deterioration	23.12%	24.78%
R.O.W. Preventable	1.73%	3.97%

5.20.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.151
5.20.10	REPORTING YEAR (SAIDI)	0.254
5.20.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.20.12	REPORTING YEAR (SAIFI)	0.003

5.20.13 CORRECTIVE ACTION PLAN:

Tree limbs had fallen during thunderstorms and made contact with our primary conductor resulting in outages.

Action Plan:
 We will continue with our ROW and equipment maintenance program as well as our line inspection program.

Circuit # 21

5.21.1	SUBSTATION NAME AND NUMBER	BRISTOW, Sub No. 14
5.21.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.21.3	CIRCUIT NAME AND NUMBER	BRISTOW, Circuit 4, 1404
5.21.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.21.5	TOTAL CIRCUIT LENGTH (MILES)	23.5
5.21.6	CUSTOMER COUNT FOR THIS CIRCUIT	1853
5.21.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	32.10%	20.02%
Equipment/Installation	0.00%	0.00%
Member/Public	30.09%	49.08%
R.O.W. Unpreventable	0.63%	0.29%
Scheduled	0.00%	0.00%
Unknown	2.86%	1.52%
Weather	31.65%	21.93%
Age/Deterioration	2.66%	7.16%
R.O.W. Preventable	0.00%	0.00%

5.21.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.737
5.21.10	REPORTING YEAR (SAIDI)	8.499
5.21.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.032
5.21.12	REPORTING YEAR (SAIFI)	0.101

5.21.13 CORRECTIVE ACTION PLAN:

This circuit exceed the 5 yr rolling average due to a large tree falling through the 3ph main line.

Action Plan:
Continue with line inspection program and the ROW management programs.

Circuit # 22

5.22.1	SUBSTATION NAME AND NUMBER	BRISTOW, Sub No. 14
5.22.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.22.3	CIRCUIT NAME AND NUMBER	BRISTOW, Circuit 2, 1402
5.22.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.22.5	TOTAL CIRCUIT LENGTH (MILES)	6.2
5.22.6	CUSTOMER COUNT FOR THIS CIRCUIT	265
5.22.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	40.69%	48.88%
Birds/Animals	41.90%	20.27%
Equipment/Installation	0.00%	0.00%
Member/Public	17.07%	30.51%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	0.34%	0.34%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.22.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.120
5.22.10	REPORTING YEAR (SAIDI)	0.683
5.22.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.22.12	REPORTING YEAR (SAIFI)	0.010

5.22.13 CORRECTIVE ACTION PLAN:

There was an outage as a result of a raccoon making contact with a primary bushing on a substation OCR. This resulted in a feeder outage affecting all 265 members served by this feeder.

Action Plan:

Continue with wildlife protection equipment installation. Continue working with EKPC to evaluate options to reduce wildlife impact on substation equipment.

Circuit # 23

5.23.1	SUBSTATION NAME AND NUMBER	KEITH, Sub No. 13
5.23.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Owen
5.23.3	CIRCUIT NAME AND NUMBER	KEITH, Circuit 2, 1302
5.23.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.23.5	TOTAL CIRCUIT LENGTH (MILES)	68.4
5.23.6	CUSTOMER COUNT FOR THIS CIRCUIT	679
5.23.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	6.96%	5.07%
Equipment/Installation	19.89%	12.09%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.37%	0.22%
Unknown	11.77%	7.12%
Weather	41.86%	68.49%
Age/Deterioration	19.15%	7.02%
R.O.W. Preventable	0.00%	0.00%

5.23.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	3.171
5.23.10	REPORTING YEAR (SAIDI)	5.538
5.23.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.028
5.23.12	REPORTING YEAR (SAIFI)	0.056

5.23.13 CORRECTIVE ACTION PLAN:

This circuit was affected by a tree falling through the 3ph mainline that resulted in a broken primary pole and this resulted in the circuit exceeding the 5yr rolling average.

Action Plan:

Continue the existing ROW and equipment management programs as well as the line inspection program.

Circuit # 24

5.24.1	SUBSTATION NAME AND NUMBER	BIG BONE, Sub No. 12
5.24.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.24.3	CIRCUIT NAME AND NUMBER	BIG BONE, Circuit 4, 1204
5.24.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.24.5	TOTAL CIRCUIT LENGTH (MILES)	21.4
5.24.6	CUSTOMER COUNT FOR THIS CIRCUIT	191
5.24.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	17.51%	24.91%
Equipment/Installation	43.32%	16.18%
Member/Public	10.37%	10.41%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	14.29%	24.75%
Weather	4.15%	12.37%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	10.37%	11.38%

5.24.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.317
5.24.10	REPORTING YEAR (SAIDI)	0.727
5.24.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.24.12	REPORTING YEAR (SAIFI)	0.010

5.24.13 CORRECTIVE ACTION PLAN:

This feeder was flagged as exceeding the 5 yr rolling average due to a feeder level outage that resulted from a jumper burning up on EKPC's equipment within the substation.

Action Plan:

EKPC and OEC conduct substation inspections. IR imaging of substation equipment is conducted periodically.

Circuit # 25

5.25.1	SUBSTATION NAME AND NUMBER	BIG BONE, Sub No. 12
5.25.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.25.3	CIRCUIT NAME AND NUMBER	BIG BONE, Circuit 1, 1201
5.25.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.25.5	TOTAL CIRCUIT LENGTH (MILES)	42.5
5.25.6	CUSTOMER COUNT FOR THIS CIRCUIT	600
5.25.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	3.79%	1.10%
Equipment/Installation	0.24%	0.11%
Member/Public	42.50%	51.43%
R.O.W. Unpreventable	6.64%	8.25%
Scheduled	0.55%	0.58%
Unknown	2.61%	0.89%
Weather	13.98%	5.47%
Age/Deterioration	27.25%	30.91%
R.O.W. Preventable	2.45%	1.26%

5.25.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	3.484
5.25.10	REPORTING YEAR (SAIDI)	19.751
5.25.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.010
5.25.12	REPORTING YEAR (SAIFI)	0.022

5.25.13 CORRECTIVE ACTION PLAN:

This feeder exceed the 5 yr rolling average due to a large outage as a result of the MVA with a primary power pole.

Action Plan:

No action was required for this feeder. However, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 26

5.26.1	SUBSTATION NAME AND NUMBER	CARSON, Sub No. 11
5.26.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.26.3	CIRCUIT NAME AND NUMBER	CARSON, Circuit 2, 1102
5.26.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.26.5	TOTAL CIRCUIT LENGTH (MILES)	57.9
5.26.6	CUSTOMER COUNT FOR THIS CIRCUIT	759
5.26.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	0.60%	0.09%
Equipment/Installation	0.15%	0.06%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	22.74%	5.91%
Scheduled	0.00%	0.00%
Unknown	7.98%	0.96%
Weather	31.02%	76.93%
Age/Deterioration	37.35%	16.01%
R.O.W. Preventable	0.15%	0.05%

5.26.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	3.864
5.26.10	REPORTING YEAR (SAIDI)	4.124
5.26.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.026
5.26.12	REPORTING YEAR (SAIFI)	0.011

5.26.13 CORRECTIVE ACTION PLAN:

A jumper sleeve failed and a conductor dropped to the ground.

Action Plan:

The sleeve was inspected and it was determined to be an isolated event. Continue with line inspection program.

Circuit # 27

5.27.1	SUBSTATION NAME AND NUMBER	CARSON, Sub No. 11
5.27.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.27.3	CIRCUIT NAME AND NUMBER	CARSON, Circuit 1, 1101
5.27.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.27.5	TOTAL CIRCUIT LENGTH (MILES)	32.3
5.27.6	CUSTOMER COUNT FOR THIS CIRCUIT	303
5.27.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	7.02%	3.19%
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	6.47%	3.64%
Weather	84.57%	91.78%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	1.93%	1.39%

5.27.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.687
5.27.10	REPORTING YEAR (SAIDI)	1.191
5.27.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.010
5.27.12	REPORTING YEAR (SAIFI)	0.012

5.27.13 CORRECTIVE ACTION PLAN:

A 3ph primary pole was hit by lightning and a polymer insulator was damaged.

Action Plan:
Continue with lightning protection program and line inspection program.

Circuit # 28

5.28.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT, Sub No. 10
5.28.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.28.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT, Circuit 3, 1003
5.28.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.28.5	TOTAL CIRCUIT LENGTH (MILES)	15.4
5.28.6	CUSTOMER COUNT FOR THIS CIRCUIT	819
5.28.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	7.69%	4.15%
Equipment/Installation	1.41%	0.17%
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	89.08%	53.87%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	1.81%	41.81%

5.28.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.054
5.28.10	REPORTING YEAR (SAIDI)	1.472
5.28.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.28.12	REPORTING YEAR (SAIFI)	0.030

5.28.13 CORRECTIVE ACTION PLAN:

This outage occurred during an extremely cold period.

Action Plan:

Engineering evaluates outages that may be a result of load imbalance, equipment coordination errors and voltage problems.

Circuit # 29

5.29.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT, Sub No. 10
5.29.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.29.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT, Circuit 2, 1002
5.29.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.29.5	TOTAL CIRCUIT LENGTH (MILES)	2.6
5.29.6	CUSTOMER COUNT FOR THIS CIRCUIT	156
5.29.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	100.00%	100.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.29.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.242
5.29.10	REPORTING YEAR (SAIDI)	0.086
5.29.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.29.12	REPORTING YEAR (SAIFI)	0.003

5.29.13 CORRECTIVE ACTION PLAN:

High wind which caused the primary lines to slap together resulting in an outage.

Action Plan:
 Line crews resagged the primary lines to eliminate the possibility of the lines slapping together in high winds.

Circuit # 30

5.30.1	SUBSTATION NAME AND NUMBER	TURKEYFOOT, Sub No. 10
5.30.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.30.3	CIRCUIT NAME AND NUMBER	TURKEYFOOT, Circuit 1, 1001
5.30.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.30.5	TOTAL CIRCUIT LENGTH (MILES)	4.0
5.30.6	CUSTOMER COUNT FOR THIS CIRCUIT	274
5.30.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	42.86%	28.85%
Equipment/Installation	57.14%	71.15%
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%

5.30.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.001
5.30.10	REPORTING YEAR (SAIDI)	0.016
5.30.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.30.12	REPORTING YEAR (SAIFI)	0.000

5.30.13 CORRECTIVE ACTION PLAN:

Outages were due to broken porcelain cut-outs.

Action Plan:

OEC is aware of a manufacturing defect that causes porcelain cut-outs to break that can result in outages. OEC is halfway through a program to remove this equipment from the field and replace with polymer insulator cutouts.

Circuit # 31

5.31.1	SUBSTATION NAME AND NUMBER	GRIFFIN, Sub No. 9
5.31.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.31.3	CIRCUIT NAME AND NUMBER	GRIFFIN, Circuit 2, 0902
5.31.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.31.5	TOTAL CIRCUIT LENGTH (MILES)	36.6
5.31.6	CUSTOMER COUNT FOR THIS CIRCUIT	360
5.31.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	12.48%	5.84%
Equipment/Installation	2.67%	1.37%
Member/Public	3.39%	3.69%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	9.98%	2.42%
Weather	71.48%	86.68%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.31.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.834
5.31.10	REPORTING YEAR (SAIDI)	1.664
5.31.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.31.12	REPORTING YEAR (SAIFI)	0.009

5.31.13 CORRECTIVE ACTION PLAN:

This outage was a result of extremely high winds that blew a mobile home into our power lines.

Action Plan:
 There are no plans at this time, but we will continue with the line inspection and ROW maintenance programs.

Circuit # 32

5.32.1	SUBSTATION NAME AND NUMBER	GRIFFIN, Sub No. 9
5.32.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.32.3	CIRCUIT NAME AND NUMBER	GRIFFIN, Circuit 1, 0901
5.32.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.32.5	TOTAL CIRCUIT LENGTH (MILES)	68.5
5.32.6	CUSTOMER COUNT FOR THIS CIRCUIT	839
5.32.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	1.17%	0.31%
Equipment/Installation	14.97%	9.04%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	22.72%	22.20%
Scheduled	0.00%	0.00%
Unknown	3.93%	2.41%
Weather	56.26%	65.26%
Age/Deterioration	0.96%	0.77%
R.O.W. Preventable	0.00%	0.00%

5.32.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.179
5.32.10	REPORTING YEAR (SAIDI)	3.142
5.32.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.017
5.32.12	REPORTING YEAR (SAIFI)	0.021

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	PENN, Sub No. 7
5.33.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.33.3	CIRCUIT NAME AND NUMBER	PENN, Circuit 3, 0703
5.33.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.33.5	TOTAL CIRCUIT LENGTH (MILES)	54.4
5.33.6	CUSTOMER COUNT FOR THIS CIRCUIT	546
5.33.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	10.30%	7.91%
Equipment/Installation	64.97%	63.37%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	1.24%	0.95%
Unknown	10.44%	9.17%
Weather	10.58%	17.12%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	2.47%	1.47%

5.33.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.710
5.33.10	REPORTING YEAR (SAIDI)	1.130
5.33.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.33.12	REPORTING YEAR (SAIFI)	0.013

5.33.13 CORRECTIVE ACTION PLAN:

This feeder was flagged as exceeding the 5 yr rolling average due to a feeder level outage that resulted from a jumper burning up on EKPC's equipment within the substation.

Action Plan:

EKPC and OEC conduct substation inspections. IR imaging of substation equipment is conducted periodically.

Circuit # 34

5.34.1	SUBSTATION NAME AND NUMBER	PENN, Sub No. 7
5.34.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.34.3	CIRCUIT NAME AND NUMBER	PENN, Circuit 2, 0702
5.34.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.34.5	TOTAL CIRCUIT LENGTH (MILES)	109.3
5.34.6	CUSTOMER COUNT FOR THIS CIRCUIT	871
5.34.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	7.69%	8.36%
Equipment/Installation	3.63%	4.97%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	6.05%	2.20%
Unknown	15.03%	15.28%
Weather	63.89%	65.05%
Age/Deterioration	0.28%	0.53%
R.O.W. Preventable	3.42%	3.60%

5.34.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.401
5.34.10	REPORTING YEAR (SAIDI)	1.910
5.34.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.011
5.34.12	REPORTING YEAR (SAIFI)	0.024

5.34.13 CORRECTIVE ACTION PLAN:

Heavy snow caused the primary lines to sag causing the conductors to make contact resulting in an outage.

Action Plan:

Line crews resagged the primary lines to eliminate the possibility of the lines making contact.

Circuit # 35

5.35.1	SUBSTATION NAME AND NUMBER	PENN, Sub No. 7
5.35.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.35.3	CIRCUIT NAME AND NUMBER	PENN, Circuit 1, 0701
5.35.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.35.5	TOTAL CIRCUIT LENGTH (MILES)	45.3
5.35.6	CUSTOMER COUNT FOR THIS CIRCUIT	423
5.35.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	9.00%	5.69%
Equipment/Installation	8.33%	8.23%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	3.92%	4.16%
Unknown	4.33%	3.27%
Weather	40.67%	73.38%
Age/Deterioration	31.08%	3.51%
R.O.W. Preventable	2.67%	1.76%

5.35.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.211
5.35.10	REPORTING YEAR (SAIDI)	2.175
5.35.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.011
5.35.12	REPORTING YEAR (SAIFI)	0.021

5.35.13 CORRECTIVE ACTION PLAN:

Ice storm affected this feeder resulting in the feeder exceeding the 5 yr rolling average.

Action Plan:

No action is necessary at this time.

Circuit # 36

5.36.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN, Sub No. 5
5.36.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.36.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN, Circuit 6, 0506
5.36.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.36.5	TOTAL CIRCUIT LENGTH (MILES)	57.2
5.36.6	CUSTOMER COUNT FOR THIS CIRCUIT	1018
5.36.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	13.65%	7.74%
Equipment/Installation	0.29%	0.33%
Member/Public	0.06%	0.06%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.63%	1.11%
Unknown	9.50%	7.95%
Weather	73.27%	81.83%
Age/Deterioration	0.17%	0.09%
R.O.W. Preventable	2.42%	0.88%

5.36.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.706
5.36.10	REPORTING YEAR (SAIDI)	2.660
5.36.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.019
5.36.12	REPORTING YEAR (SAIFI)	0.029

5.36.13 CORRECTIVE ACTION PLAN:

During an extreme cold event a dead-end shoe broke and a primary line fell to the ground.

Action Plan:

This appears to be a unique event and no action is recommended at this time.

Circuit # 37

5.37.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN, Sub No. 5
5.37.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.37.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN, Circuit 1, 0501
5.37.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.37.5	TOTAL CIRCUIT LENGTH (MILES)	66.1
5.37.6	CUSTOMER COUNT FOR THIS CIRCUIT	645
5.37.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	0.12%	0.11%
Equipment/Installation	23.55%	8.16%
Member/Public	48.34%	71.12%
R.O.W. Unpreventable	0.24%	0.33%
Scheduled	0.00%	0.00%
Unknown	25.03%	18.21%
Weather	1.68%	1.95%
Age/Deterioration	1.04%	0.13%
R.O.W. Preventable	0.00%	0.00%

5.37.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.306
5.37.10	REPORTING YEAR (SAIDI)	2.480
5.37.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.37.12	REPORTING YEAR (SAIFI)	0.042

5.37.13 CORRECTIVE ACTION PLAN:

An outside contractor got a crane into our primary line.

Action Plan:

OEC personnel advised contractor of the dangers involved. OEC continues to maintain a educational program about avoiding primary lines.

Circuit # 38

5.38.1	SUBSTATION NAME AND NUMBER	MUNK, Sub No. 4
5.38.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.38.3	CIRCUIT NAME AND NUMBER	MUNK, Circuit 7, 0407
5.38.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.38.5	TOTAL CIRCUIT LENGTH (MILES)	25.0
5.38.6	CUSTOMER COUNT FOR THIS CIRCUIT	428
5.38.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	12.62%	4.34%
Equipment/Installation	0.00%	0.00%
Member/Public	38.45%	55.21%
R.O.W. Unpreventable	0.78%	0.54%
Scheduled	0.00%	0.00%
Unknown	7.77%	3.96%
Weather	2.14%	2.14%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	38.25%	33.81%

5.38.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.928
5.38.10	REPORTING YEAR (SAIDI)	2.450
5.38.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.010
5.38.12	REPORTING YEAR (SAIFI)	0.018

5.38.13 CORRECTIVE ACTION PLAN:

This feeder exceed the 5 yr rolling average due to a large outage as a result of the MVA with a primary double circuit power pole.

Action Plan:

No action was required for this feeder. However, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 39

5.39.1	SUBSTATION NAME AND NUMBER	MUNK, Sub No. 4
5.39.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.39.3	CIRCUIT NAME AND NUMBER	MUNK, Circuit 5, 0405
5.39.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.39.5	TOTAL CIRCUIT LENGTH (MILES)	36.5
5.39.6	CUSTOMER COUNT FOR THIS CIRCUIT	786
5.39.7	DATE OF LAST CIRCUIT TRIM (VM)	2015

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	2.11%	1.17%
Equipment/Installation	0.13%	0.08%
Member/Public	48.55%	57.91%
R.O.W. Unpreventable	2.57%	0.68%
Scheduled	0.00%	0.00%
Unknown	6.64%	5.56%
Weather	16.45%	28.74%
Age/Deterioration	0.07%	0.04%
R.O.W. Preventable	23.49%	5.81%

5.39.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.070
5.39.10	REPORTING YEAR (SAIDI)	2.595
5.39.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.015
5.39.12	REPORTING YEAR (SAIFI)	0.026

5.39.13 CORRECTIVE ACTION PLAN:

This feeder exceed the 5 yr rolling average due to a large outage as a result of the MVA with a primary double circuit power pole.

Action Plan:

No action was required for this feeder. However, engineering takes into consideration all NESC codes and RUS construction standards to ensure that power lines are constructed safely.

Circuit # 40

5.40.1	SUBSTATION NAME AND NUMBER	MUNK, Sub No. 4
5.40.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.40.3	CIRCUIT NAME AND NUMBER	MUNK, Circuit 4, 0404
5.40.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.40.5	TOTAL CIRCUIT LENGTH (MILES)	1.8
5.40.6	CUSTOMER COUNT FOR THIS CIRCUIT	20
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	0.00%	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%	38.05%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	50.00%	61.95%

5.40.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.016
5.40.10	REPORTING YEAR (SAIDI)	0.019
5.40.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.40.12	REPORTING YEAR (SAIFI)	0.000

5.40.13 CORRECTIVE ACTION PLAN:

Outages due to vines growing up in to the primary lines and unknown outages resulted in this feeder exceeding the 5 year rolling average.

Action Plan:

We will continue our line inspection and maintenance programs.

Circuit # 41

5.41.1	SUBSTATION NAME AND NUMBER	MUNK, Sub No. 4
5.41.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.41.3	CIRCUIT NAME AND NUMBER	MUNK, Circuit 2, 0402
5.41.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.41.5	TOTAL CIRCUIT LENGTH (MILES)	51.4
5.41.6	CUSTOMER COUNT FOR THIS CIRCUIT	734
5.41.7	DATE OF LAST CIRCUIT TRIM (VM)	2012

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	0.33%	0.20%
Equipment/Installation	29.70%	37.47%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	22.14%	36.03%
Unknown	21.63%	9.32%
Weather	23.23%	14.69%
Age/Deterioration	2.98%	2.30%
R.O.W. Preventable	0.00%	0.00%

5.41.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.165
5.41.10	REPORTING YEAR (SAIDI)	6.064
5.41.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.019
5.41.12	REPORTING YEAR (SAIFI)	0.046

5.41.13 CORRECTIVE ACTION PLAN:

There were two equipment issues on this circuit; a broken insulator and a copper conductor that broke.

Action Plan:

Continue with the line inspection program and maintenance programs. Continue with the aged conductor (Copper) replacement program.

Circuit # 42

5.42.1	SUBSTATION NAME AND NUMBER	GRANTSlick, Sub No. 3
5.42.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.42.3	CIRCUIT NAME AND NUMBER	GRANTSlick, Circuit 3, 0303
5.42.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.42.5	TOTAL CIRCUIT LENGTH (MILES)	42.4
5.42.6	CUSTOMER COUNT FOR THIS CIRCUIT	562
5.42.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	61.92%	57.28%
Equipment/Installation	2.05%	1.20%
Member/Public	3.17%	2.79%
R.O.W. Unpreventable	2.05%	1.38%
Scheduled	4.91%	9.14%
Unknown	10.64%	8.46%
Weather	13.00%	17.08%
Age/Deterioration	2.15%	2.56%
R.O.W. Preventable	0.10%	0.13%

5.42.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.718
5.42.10	REPORTING YEAR (SAIDI)	1.485
5.42.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.012
5.42.12	REPORTING YEAR (SAIFI)	0.017

5.42.13 CORRECTIVE ACTION PLAN:

Various wildlife outages occurred on this feeder including a circuit level outage that was caused by wildlife contact on unfused single phase tap that resulted in a feeder outage.

Action Plan:

This tap was fused as a result of this outage as part of a continuing program of sectionalizing and hardening our circuits. However, there are taps that are single or double spans with clear line of sight still remain exposed. Continue with a line inspection and wildlife guard installation.

Circuit # 43

5.43.1	SUBSTATION NAME AND NUMBER	GRANTSLICK, Sub No. 3
5.43.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.43.3	CIRCUIT NAME AND NUMBER	GRANTSLICK, Circuit 2, 0302
5.43.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.43.5	TOTAL CIRCUIT LENGTH (MILES)	57.7
5.43.6	CUSTOMER COUNT FOR THIS CIRCUIT	718
5.43.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

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	7.16%	3.77%
Equipment/Installation	0.37%	0.15%
Member/Public	4.41%	1.97%
R.O.W. Unpreventable	5.51%	6.81%
Scheduled	1.19%	1.78%
Unknown	8.54%	5.65%
Weather	70.80%	78.99%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	2.02%	0.89%

5.43.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	14.478
5.43.10	REPORTING YEAR (SAIDI)	4.415
5.43.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.019
5.43.12	REPORTING YEAR (SAIFI)	0.031

5.43.13 CORRECTIVE ACTION PLAN:

Various outages due to high winds affected this outage including an outage that was a result of a tree getting in the primary line and breaking the phase and neutral conductors.

Action Plan:

Continue with the ROW maintenance program and line inspection program.

Circuit # 44

5.44.1	SUBSTATION NAME AND NUMBER	BANKLICK, Sub No. 2
5.44.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.44.3	CIRCUIT NAME AND NUMBER	BANKLICK, Circuit 5, 0205
5.44.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.44.5	TOTAL CIRCUIT LENGTH (MILES)	12.2
5.44.6	CUSTOMER COUNT FOR THIS CIRCUIT	202
5.44.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

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	1.98%	2.81%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	96.35%	74.68%
Unknown	0.10%	0.63%
Weather	0.21%	1.23%
Age/Deterioration	1.36%	20.66%
R.O.W. Preventable	0.00%	0.00%

5.44.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.693
5.44.10	REPORTING YEAR (SAIDI)	0.194
5.44.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.011
5.44.12	REPORTING YEAR (SAIFI)	0.016

5.44.13 CORRECTIVE ACTION PLAN:

Various scheduled outages affect this circuit.

Action plan:

None at this time. This scheduled work is part of on going OEC construction work plan upgrades to improve overall reliability to the system.

Circuit # 45

5.45.1	SUBSTATION NAME AND NUMBER	BANKLICK, Sub No. 2
5.45.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.45.3	CIRCUIT NAME AND NUMBER	BANKLICK, Circuit 3, 0203
5.45.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.45.5	TOTAL CIRCUIT LENGTH (MILES)	38.2
5.45.6	CUSTOMER COUNT FOR THIS CIRCUIT	424
5.45.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.45.23 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	37.32%	39.33%
Equipment/Installation	14.36%	22.74%
Member/Public	3.90%	2.12%
R.O.W. Unpreventable	0.09%	0.06%
Scheduled	0.27%	0.44%
Unknown	9.84%	7.76%
Weather	15.51%	5.04%
Age/Deterioration	14.72%	16.27%
R.O.W. Preventable	3.99%	6.26%

5.45.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.482
5.45.10	REPORTING YEAR (SAIDI)	2.133
5.45.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.009
5.45.12	REPORTING YEAR (SAIFI)	0.024

5.45.13 CORRECTIVE ACTION PLAN:

There were various wildlife related outages.

Action Plan:

Continue with the wildlife guard installation program.

Circuit # 46

5.46.1	SUBSTATION NAME AND NUMBER	BANKLICK, Sub No. 2
5.46.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.46.3	CIRCUIT NAME AND NUMBER	BANKLICK, Circuit 2, 0202
5.46.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.46.5	TOTAL CIRCUIT LENGTH (MILES)	66.4
5.46.6	CUSTOMER COUNT FOR THIS CIRCUIT	1024
5.46.7	DATE OF LAST CIRCUIT TRIM (VM)	2014

5.46.23 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	8.67%	3.50%
Equipment/Installation	0.55%	0.45%
Member/Public	3.20%	2.54%
R.O.W. Unpreventable	0.61%	0.19%
Scheduled	0.00%	0.00%
Unknown	64.97%	75.05%
Weather	16.04%	11.34%
Age/Deterioration	2.52%	1.55%
R.O.W. Preventable	3.44%	5.39%

5.46.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.313
5.46.10	REPORTING YEAR (SAIDI)	3.407
5.46.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.021
5.46.12	REPORTING YEAR (SAIFI)	0.028

5.46.13 CORRECTIVE ACTION PLAN:

This circuit exceeded the 5 yr rolling outages indices due to several porcelain cutout failures and a primary 3ph pole fire that resulted in a feeder level outage.

Action Plan:

Continue the line inspection program and the porcelain change out program.

Circuit # 47

5.47.1	SUBSTATION NAME AND NUMBER	BOONE, Sub No. 1
5.47.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.47.3	CIRCUIT NAME AND NUMBER	BOONE, Circuit 1, 0101
5.47.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	See Coop.
5.47.5	TOTAL CIRCUIT LENGTH (MILES)	25.9
5.47.6	CUSTOMER COUNT FOR THIS CIRCUIT	283
5.47.7	DATE OF LAST CIRCUIT TRIM (VM)	2013

5.47.23 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	15.48%	8.26%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	1.39%	0.61%
Scheduled	0.00%	0.00%
Unknown	6.35%	4.89%
Weather	70.44%	79.53%
Age/Deterioration	1.59%	0.83%
R.O.W. Preventable	4.76%	5.89%

5.47.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.725
5.47.10	REPORTING YEAR (SAIDI)	0.830
5.47.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.006
5.47.12	REPORTING YEAR (SAIFI)	0.008

5.47.13 CORRECTIVE ACTION PLAN:

Several outage that were weather related affected this circuit including lightning and high winds. One outage due to a tree falling through the primary line resulted in a outage.

Action Plan:

Continue the Line Inspection and ROW maintenance programs.

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.

New in 2015 was a need for 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 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 2015 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 2014-2017 Construction Work Plan.

We continue to operate a State-funded (DEDI) "smart-grid" self-healing project which was deployed in April of 2011 and two additional sites through a Federally funded DOE grant, to provide backup power to critical Sanitation District plants.

OEC, in cooperation with EKPC, has completed planning on a new substation in our southern territory that will reduce exposure on our long rural 25kv circuits which should improve reliability significantly for our membership in this area of our service territory. This substation is scheduled for completion in December of 2016. 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.