



April 12, 2022

Linda C. Bridwell, P.E.
Executive Director
Kentucky Public Service Commission
P.O. Box 615
Frankfort, Kentucky 40602-0615

RE: Administrative Case No. 2011-00450

Dear Ms. Bridwell,

Enclosed are the original and one (1) electronic copy of the 2021 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	2022
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SECTION 3: MAJOR EVENT DAYS

T_{MED}	7.529
FIRST DATE USED TO DETERMINE T_{MED}	1-Jan-2017
LAST DATE USED TO DETERMINE T_{MED}	31-Dec-2021
NUMBER OF MED IN REPORT YEAR	2

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	64,310
TOTAL CIRCUITS	127
Excluding MED	
5 YEAR AVERAGE	REPORTING YEAR
SAIDI	114.07
SAIFI	1.10
SAIDI	102.40
SAIFI	1.35
Including MED	
5 YEAR AVERAGE	REPORTING YEAR
SAIDI	212.21
SAIFI	1.44
SAIDI	159.83
SAIFI	1.54

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	BRISTOW II(56)
5.1.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.1.3	CIRCUIT NAME AND NUMBER	BRISTOW II(56), Circuit 8, 5608
5.1.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Falcon Ridge
5.1.5	TOTAL CIRCUIT LENGTH (MILES)	10.0
5.1.6	CUSTOMER COUNT FOR THIS CIRCUIT	744
5.1.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

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	99.74%	99.69%
Weather	0.00%	0.00%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.26%	0.31%

5.1.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.008
5.1.10	REPORTING YEAR (SAIDI)	0.467
5.1.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.1.12	REPORTING YEAR (SAIFI)	0.012

5.1.13 CORRECTIVE ACTION PLAN:

One main outage, being a feeder outage lasting approximately 30 minutes, accounted for nearly all the SAIDI and SAIFI for this period. There was no reason found to be the culprit of the outage.

Action Plan

This feeder is finishing a circuit trim currently, which will help to prevent potential tree caused outages.

Circuit # 2

5.2.1	SUBSTATION NAME AND NUMBER	RICHARDSON II(55)
5.2.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.2.3	CIRCUIT NAME AND NUMBER	RICHARDSON II(55), Circuit 5, 5505
5.2.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Far Hill Dr.
5.2.5	TOTAL CIRCUIT LENGTH (MILES)	7.5
5.2.6	CUSTOMER COUNT FOR THIS CIRCUIT	453
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	26.97%	23.60%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	1.23%	0.84%
Scheduled	0.00%	0.00%
Unknown	10.84%	5.93%
Weather	60.96%	69.63%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.2.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.643
5.2.10	REPORTING YEAR (SAIDI)	0.704
5.2.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.009
5.2.12	REPORTING YEAR (SAIFI)	0.013

5.2.13 CORRECTIVE ACTION PLAN:

A total of 13 outages occurred on this feeder for the year 2021. Eight of those outages occurred on the same single phase tap. A three phase feeder outage was the main contributor to SAIDI and SAIFI for this period. A lightning event caused the main feeder breaker to open, causing an approximately 1 hour outage for all 453 members.

Action Plan

The single phase tap that had multiple outages is currently in the process of being reconducted, which will help reduce outages on this section.

Circuit # 3

5.3.1	SUBSTATION NAME AND NUMBER	DURO II(54)
5.3.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.3.3	CIRCUIT NAME AND NUMBER	DURO II(54), Circuit 2, 5402
5.3.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Maher Rd
5.3.5	TOTAL CIRCUIT LENGTH (MILES)	12.2
5.3.6	CUSTOMER COUNT FOR THIS CIRCUIT	618
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	0.55%	0.63%
Equipment/Installation	0.00%	0.00%
Member/Public	2.48%	0.87%
R.O.W. Unpreventable	2.48%	2.51%
Scheduled	0.00%	0.00%
Unknown	87.07%	76.45%
Weather	4.95%	5.62%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	2.48%	13.92%

5.3.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.395
5.3.10	REPORTING YEAR (SAIDI)	0.506
5.3.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.3.12	REPORTING YEAR (SAIFI)	0.011

5.3.13 CORRECTIVE ACTION PLAN:

There were several small outages on the feeder throughout the year, but there was one feeder outage, with an unknown cause, which contributed to most of the SAIDI and SAIFI for this reporting year. All 618 members were out, for nearly 40 minutes, until power was restored.

Action Plan:

Circuit overall remains reliable and has minimal exposure, no additional plans at this time.

Circuit # 4

5.4.1	SUBSTATION NAME AND NUMBER	SMOOT II(53)
5.4.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.4.3	CIRCUIT NAME AND NUMBER	SMOOT II(53), Circuit 8, 5308
5.4.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Pleasant Valley Rd
5.4.5	TOTAL CIRCUIT LENGTH (MILES)	22.1
5.4.6	CUSTOMER COUNT FOR THIS CIRCUIT	1580
5.4.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

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	0.59%	0.75%
Equipment/Installation	0.00%	0.00%
Member/Public	32.77%	30.05%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	31.75%	40.00%
Weather	34.89%	29.20%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.4.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.489
5.4.10	REPORTING YEAR (SAIDI)	4.313
5.4.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.4.12	REPORTING YEAR (SAIFI)	0.076

5.4.13 CORRECTIVE ACTION PLAN:

There were 8 outages on this feeder throughout the year, three of which were feeder outages. One of the largest events was public caused with a wreck resulting in a broken guy wire.

Action Plan

Due to highway relocations, a portion of this circuit is now moved and new, which should help reliability.

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 10, 5110
5.5.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Flagg Springs
5.5.5	TOTAL CIRCUIT LENGTH (MILES)	137.1
5.5.6	CUSTOMER COUNT FOR THIS CIRCUIT	1608
5.5.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	77.61%	73.51%
Equipment/Installation	0.56%	0.71%
Member/Public	0.02%	0.01%
R.O.W. Unpreventable	3.38%	2.61%
Scheduled	0.72%	1.13%
Unknown	1.79%	2.40%
Weather	12.35%	17.21%
Age/Deterioration	0.04%	0.02%
R.O.W. Preventable	3.52%	2.39%

5.5.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	5.124
5.5.10	REPORTING YEAR (SAIDI)	5.062
5.5.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.050
5.5.12	REPORTING YEAR (SAIFI)	0.069

5.5.13 CORRECTIVE ACTION PLAN:

Overall this is one of the longer feeders on the Owen Electric System and significant portions are cross country through woods and fields. This reporting year SAIDI and SAIFI is relatively on par compared to the previous 5 years, albeit slightly above on SAIFI. There are numerous outages at various locations all through the feeder. Overall this feeder is well fused to minimize the number of members affected per outage.

Action Plan:

Circuit Trim was completed in 2021, which should help reliability in terms of weather, right of way, and also removes access and nesting sites for birds and squirrels, which should also help reliability overall.

Circuit # 6

5.6.1	SUBSTATION NAME AND NUMBER	GRANTSLICK II(51)
5.6.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.6.3	CIRCUIT NAME AND NUMBER	GRANTSLICK II(51), Circuit 9, 5109
5.6.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Kenton Station
5.6.5	TOTAL CIRCUIT LENGTH (MILES)	73.1
5.6.6	CUSTOMER COUNT FOR THIS CIRCUIT	1316
5.6.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	29.33%	27.90%
Birds/Animals	30.13%	39.84%
Equipment/Installation	0.02%	0.03%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	5.84%	3.83%
Scheduled	0.00%	0.00%
Unknown	0.51%	0.55%
Weather	34.15%	27.82%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.02%	0.02%

5.6.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.272
5.6.10	REPORTING YEAR (SAIDI)	5.335
5.6.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.016
5.6.12	REPORTING YEAR (SAIFI)	0.070

5.6.13 CORRECTIVE ACTION PLAN:

This feeder is very similar in nature to the previous, in that it is long and goes through significant portions of right of way. This led to numerous small outages on the circuit throughout the year. There were a few feeder outages on this circuit for 2021. One was due to power supplier, while the others were wind from a weather event. Animals also caused a significant portion of the associated SAIDI and SAIFI

Action Plan:

There was additional reprogramming of downline reclosers, which should help with overall coordination of this circuit and enable additional fuse saving for temporary faults.

Circuit # 7

5.7.1	SUBSTATION NAME AND NUMBER	GRANTSLICK II(51)
5.7.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.7.3	CIRCUIT NAME AND NUMBER	GRANTSLICK II(51), Circuit 7, 5107
5.7.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Morning View
5.7.5	TOTAL CIRCUIT LENGTH (MILES)	75.7
5.7.6	CUSTOMER COUNT FOR THIS CIRCUIT	864
5.7.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	26.51%	18.51%
Birds/Animals	27.00%	41.53%
Equipment/Installation	0.89%	1.29%
Member/Public	5.82%	5.37%
R.O.W. Unpreventable	26.20%	10.81%
Scheduled	0.00%	0.00%
Unknown	0.86%	0.54%
Weather	8.70%	17.95%
Age/Deterioration	0.03%	0.04%
R.O.W. Preventable	3.98%	3.97%

5.7.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.957
5.7.10	REPORTING YEAR (SAIDI)	3.198
5.7.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.012
5.7.12	REPORTING YEAR (SAIFI)	0.051

5.7.13 CORRECTIVE ACTION PLAN:

This feeder is very similar in nature to the previous, in that it is long and goes through significant portions of right of way. Overall, there were numerous small outages on the circuit throughout the year. There were a few feeder outages on this circuit for 2021. One was due to power supplier, while the others were wind from a weather event. Animals also caused a significant portion of the associated SAIDI and SAIFI

Action Plan:

Recoordination Job was completed in 2021, this should help increase overall reliability on this feeder.

Circuit # 8

5.8.1	SUBSTATION NAME AND NUMBER	LONG LICK(29)
5.8.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.8.3	CIRCUIT NAME AND NUMBER	LONG LICK(29), Circuit 4, 2904
5.8.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Colony
5.8.5	TOTAL CIRCUIT LENGTH (MILES)	15.2
5.8.6	CUSTOMER COUNT FOR THIS CIRCUIT	736
5.8.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	0.97%	0.62%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	32.73%	3.11%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	33.61%	1.47%
Age/Deterioration	32.68%	94.79%
R.O.W. Preventable	0.00%	0.00%

5.8.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.009
5.8.10	REPORTING YEAR (SAIDI)	5.176
5.8.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.8.12	REPORTING YEAR (SAIFI)	0.035

5.8.13 CORRECTIVE ACTION PLAN:

There was an unusually high number of feeder outages on this circuit for 2021. One of those outages occurred from a guy wire breaking close to the substation. This caused a multi-hour outage contributing significantly to the overall SAIDI.

Action Plan:

A Circuit Trim was completed in 2021, which will help reduce exposure to potential outages.

Circuit # 9

5.9.1	SUBSTATION NAME AND NUMBER	LONG LICK(29)
5.9.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.9.3	CIRCUIT NAME AND NUMBER	LONG LICK(29), Circuit 3, 2903
5.9.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Glass Pike
5.9.5	TOTAL CIRCUIT LENGTH (MILES)	75.9
5.9.6	CUSTOMER COUNT FOR THIS CIRCUIT	657
5.9.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	5.18%	6.05%
Equipment/Installation	0.11%	0.10%
Member/Public	1.94%	1.94%
R.O.W. Unpreventable	0.06%	0.08%
Scheduled	0.00%	0.00%
Unknown	0.74%	0.92%
Weather	90.43%	89.53%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	1.54%	1.37%

5.9.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.669
5.9.10	REPORTING YEAR (SAIDI)	2.066
5.9.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.009
5.9.12	REPORTING YEAR (SAIFI)	0.027

5.9.13 CORRECTIVE ACTION PLAN:

This is another long feeder and all but two of the outages were smaller single phase occurrences. Weather events, seemingly mostly from lightning was the cause of most of these outages. There was one large storm event that caused a feeder outage, which was the main contributor to SAIDI and SAIFI for this period.

Action Plan:

A Circuit Trim was completed in 2021, which will help reduce exposure to potential outages.

Circuit # 10

5.10.1	SUBSTATION NAME AND NUMBER	BELLEVIEW(27)
5.10.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.10.3	CIRCUIT NAME AND NUMBER	BELLEVIEW(27), Circuit 3, 2703
5.10.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Botts Ln.
5.10.5	TOTAL CIRCUIT LENGTH (MILES)	19.2
5.10.6	CUSTOMER COUNT FOR THIS CIRCUIT	166
5.10.7	DATE OF LAST CIRCUIT TRIM (VM)	2019

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	44.03%	16.82%
Birds/Animals	6.63%	5.23%
Equipment/Installation	0.27%	0.60%
Member/Public	2.12%	1.06%
R.O.W. Unpreventable	43.50%	69.31%
Scheduled	0.00%	0.00%
Unknown	2.39%	2.53%
Weather	1.06%	4.44%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.10.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.603
5.10.10	REPORTING YEAR (SAIDI)	0.445
5.10.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.10.12	REPORTING YEAR (SAIFI)	0.006

5.10.13 CORRECTIVE ACTION PLAN:

This circuit had similar SAIDI and SAIFI numbers compared to the five year average, with SAIDI being slightly below the average and the SAIFI slightly higher. Overall trees outside of the right of way were the main culprit of outages in this instance.

Action Plan:

A recoordination plan was made in late 2021 to help minimize the effects of a potential outage.

Circuit # 11

5.11.1	SUBSTATION NAME AND NUMBER	STERLING(25)
5.11.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.11.3	CIRCUIT NAME AND NUMBER	STERLING(25), Circuit 3, 2503
5.11.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Big Bone
5.11.5	TOTAL CIRCUIT LENGTH (MILES)	31.0
5.11.6	CUSTOMER COUNT FOR THIS CIRCUIT	325
5.11.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	18.29%	10.56%
Equipment/Installation	0.00%	0.00%
Member/Public	54.53%	52.95%
R.O.W. Unpreventable	16.61%	15.84%
Scheduled	0.00%	0.00%
Unknown	1.68%	1.33%
Weather	8.56%	19.08%
Age/Deterioration	0.34%	0.25%
R.O.W. Preventable	0.00%	0.00%

5.11.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.210
5.11.10	REPORTING YEAR (SAIDI)	0.922
5.11.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.11.12	REPORTING YEAR (SAIFI)	0.009

5.11.13 CORRECTIVE ACTION PLAN:

This circuit had a SAIFI and SAIDI very close to the 5 year average with the current year SAIDI being less and the reporting year SAIFI being slightly higher. The main cause for the slightly increased SAIFI was due to a member caused outage when a commercial truck ran into a pole near their site.

Action Plan:

Overall, this feeder has remained essentially consistent compared to the five year average, there are no additional plans at this time.

Circuit # 12

5.12.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.12.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.12.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 5, 2405
5.12.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Burlington Woods
5.12.5	TOTAL CIRCUIT LENGTH (MILES)	7.1
5.12.6	CUSTOMER COUNT FOR THIS CIRCUIT	529
5.12.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	10.92%	3.73%
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	89.08%	96.27%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.12.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.382
5.12.10	REPORTING YEAR (SAIDI)	0.650
5.12.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.12.12	REPORTING YEAR (SAIFI)	0.009

5.12.13 CORRECTIVE ACTION PLAN:

Overall this is a short, reliable circuit. This feeder had 2 outages for 2021. There was one main outage that caused all 529 members to lose power for 75 minutes due to a switch failing during a snow event, which caused the substation circuit switcher to open. The other was a single phase tap that was caused by wildlife.

Action Plan:

This high density circuit has little exposure, there is no additional plans at this time.

Circuit # 13

5.13.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.13.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.13.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 4, 2404
5.13.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Hunters Ridge
5.13.5	TOTAL CIRCUIT LENGTH (MILES)	15.8
5.13.6	CUSTOMER COUNT FOR THIS CIRCUIT	411
5.13.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	5.18%	2.80%
Equipment/Installation	0.00%	0.00%
Member/Public	0.09%	0.07%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	89.27%	86.69%
Age/Deterioration	3.42%	4.25%
R.O.W. Preventable	2.04%	6.18%

5.13.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.699
5.13.10	REPORTING YEAR (SAIDI)	1.123
5.13.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.13.12	REPORTING YEAR (SAIFI)	0.017

5.13.13 CORRECTIVE ACTION PLAN:

Several outages occurred for this reporting period. The majority were smaller single phase outages, mainly smaller tree caused outages. However there was a feeder outage due to the previously mentioned failed switch which was a main cause for the increased SAIDI and SIAFI for this reporting period.

Action Plan:

This feeder was recoordinates in early 2022, which should help minimize member exposure to certain outages.

Circuit # 14

5.14.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.14.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.14.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 3, 2403
5.14.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Conrad Ln
5.14.5	TOTAL CIRCUIT LENGTH (MILES)	13.6
5.14.6	CUSTOMER COUNT FOR THIS CIRCUIT	497
5.14.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	10.92%	13.96%
Equipment/Installation	0.00%	0.00%
Member/Public	0.50%	1.75%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	88.40%	83.81%
Age/Deterioration	0.17%	0.48%
R.O.W. Preventable	0.00%	0.00%

5.14.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.421
5.14.10	REPORTING YEAR (SAIDI)	0.521
5.14.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.14.12	REPORTING YEAR (SAIFI)	0.009

5.14.13 CORRECTIVE ACTION PLAN:

There were 12 outages on this feeder for 2021, several of those affected one or two members at a time, with the vast majority affecting less than 20 members at a time. The same aforementioned switch outage did cause a feeder outage for all 497 members, which is what caused this feeder to have a SAIDI and SAIFI over the 5 year reporting average.

Action Plan:

This circuit is planned to be recoordinates in 2022, which could help with overall member exposure to certain outages.

Circuit # 15

5.15.1	SUBSTATION NAME AND NUMBER	BURLINGTON(24)
5.15.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.15.3	CIRCUIT NAME AND NUMBER	BURLINGTON(24), Circuit 2, 2402
5.15.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Hanover Park
5.15.5	TOTAL CIRCUIT LENGTH (MILES)	10.9
5.15.6	CUSTOMER COUNT FOR THIS CIRCUIT	767
5.15.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	0.00%	0.00%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.23%	0.12%
Unknown	0.00%	0.00%
Weather	99.77%	99.88%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.15.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.065
5.15.10	REPORTING YEAR (SAIDI)	1.026
5.15.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.001
5.15.12	REPORTING YEAR (SAIFI)	0.014

5.15.13 CORRECTIVE ACTION PLAN:

There were 5 outages on this circuit for 2021, but the only significant contributor to the SAIDI and SAIFI was again, the previously mentioned switch failure, which caused the station circuit switcher to open.

Action Plan:

Circuit still has few outages, no additional plans at this time.

Circuit # 16

5.16.1	SUBSTATION NAME AND NUMBER	HEBRON(22)
5.16.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.16.3	CIRCUIT NAME AND NUMBER	HEBRON(22), Circuit 4, 2204
5.16.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Williams Rd
5.16.5	TOTAL CIRCUIT LENGTH (MILES)	32.3
5.16.6	CUSTOMER COUNT FOR THIS CIRCUIT	747
5.16.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

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	7.71%	17.88%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	9.49%	22.12%
Scheduled	0.00%	0.00%
Unknown	2.67%	5.23%
Weather	79.74%	52.52%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.40%	2.25%

5.16.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.462
5.16.10	REPORTING YEAR (SAIDI)	0.675
5.16.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.012
5.16.12	REPORTING YEAR (SAIFI)	0.016

5.16.13 CORRECTIVE ACTION PLAN:

The SAIDI for this reporting period is about half of the 5 year average, with the SAIFI being slightly higher. The main contributor was a weather event that involved a tree falling close to the three phase, which required de-energization to safely remove.

Action Plan:

There are no additional plans as the current sectionalizing plan is minimizing the affected members during outage events.

Circuit # 17

5.17.1	SUBSTATION NAME AND NUMBER	NOEL(21)
5.17.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.17.3	CIRCUIT NAME AND NUMBER	NOEL(21), Circuit 3, 2103
5.17.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Dry Ridge
5.17.5	TOTAL CIRCUIT LENGTH (MILES)	61.0
5.17.6	CUSTOMER COUNT FOR THIS CIRCUIT	1172
5.17.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	1.53%	1.68%
Equipment/Installation	2.50%	3.57%
Member/Public	81.55%	58.37%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.55%	1.55%
Weather	12.21%	34.01%
Age/Deterioration	1.11%	0.21%
R.O.W. Preventable	0.55%	0.60%

5.17.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.950
5.17.10	REPORTING YEAR (SAIDI)	0.940
5.17.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.018
5.17.12	REPORTING YEAR (SAIFI)	0.022

5.17.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder, all but one of which were single phase outages. The largest contributor to SAIDI and SAIFI was a member involved car that broke a guy wire and caused the feeder breaker to open.

Action Plan:

Recoordination occurred in 2022 to add additional fuse saving capability to potentially prevent temporary outages from becoming permanent.

Circuit # 18

5.18.1	SUBSTATION NAME AND NUMBER	NOEL(21)
5.18.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.18.3	CIRCUIT NAME AND NUMBER	NOEL(21), Circuit 2, 2102
5.18.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Folsom
5.18.5	TOTAL CIRCUIT LENGTH (MILES)	84.5
5.18.6	CUSTOMER COUNT FOR THIS CIRCUIT	799
5.18.7	DATE OF LAST CIRCUIT TRIM (VM)	2019

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	40.89%	20.87%
Birds/Animals	0.61%	0.39%
Equipment/Installation	0.05%	0.03%
Member/Public	1.68%	1.21%
R.O.W. Unpreventable	3.52%	4.73%
Scheduled	0.46%	0.60%
Unknown	4.95%	10.03%
Weather	5.41%	7.14%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	42.42%	55.02%

5.18.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.705
5.18.10	REPORTING YEAR (SAIDI)	2.758
5.18.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.006
5.18.12	REPORTING YEAR (SAIFI)	0.030

5.18.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder, mainly being smaller individual single phase outages. However, there were two separate events, the first being a feeder outage caused by a fallen tree and another caused by the power suppliers failed switch that led to this reporting period having a higher than average SAIDI and SAIFI.

Action Plan:

None at this time.

Circuit # 19

5.28.5	SUBSTATION NAME AND NUMBER	DOWNING(20)
5.19.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.19.3	CIRCUIT NAME AND NUMBER	DOWNING(20), Circuit 1, 2001
5.19.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Ridgefield
5.19.5	TOTAL CIRCUIT LENGTH (MILES)	17.8
5.19.6	CUSTOMER COUNT FOR THIS CIRCUIT	1236
5.19.7	DATE OF LAST CIRCUIT TRIM (VM)	2020

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	0.16%	0.59%
Equipment/Installation	48.43%	27.48%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	51.41%	71.93%
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%

5.19.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.815
5.19.10	REPORTING YEAR (SAIDI)	1.329
5.19.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.027
5.19.12	REPORTING YEAR (SAIFI)	0.040

5.19.13 CORRECTIVE ACTION PLAN:

There were seven outages on this feeder. The two largest causes were feeder outages, but both were under 50 minutes. The first was due to a construction crew installing new wire when a roller failed causing an outage, which was rectified quickly. The second large outage was due to a tree outside of the right of way falling into the 3 phase section of line.

Action Plan:

A recoordination plan is scheduled for 2022, which should help minimize outage effects.

Circuit # 20

5.20.1	SUBSTATION NAME AND NUMBER	RICHARDSON(19)
5.20.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.20.3	CIRCUIT NAME AND NUMBER	RICHARDSON(19), Circuit 3, 1903
5.20.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Narrows Rd
5.20.5	TOTAL CIRCUIT LENGTH (MILES)	19.3
5.20.6	CUSTOMER COUNT FOR THIS CIRCUIT	1001
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	0.15%	0.88%
Equipment/Installation	95.70%	70.84%
Member/Public	0.34%	0.99%
R.O.W. Unpreventable	2.00%	16.89%
Scheduled	1.76%	10.00%
Unknown	0.00%	0.00%
Weather	0.05%	0.39%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.20.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.578
5.20.10	REPORTING YEAR (SAIDI)	0.515
5.20.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.027
5.20.12	REPORTING YEAR (SAIFI)	0.032

5.20.13 CORRECTIVE ACTION PLAN:

There were 12 outages for this reporting period and the main contributor to the SAIDI and SAIFI was a failure by a contracting crew to properly tie a jumper together, causing a feeder outage, removing the nearly 1,000 members offline.

Action Plan:

None at this time.

Circuit # 21

5.21.1	SUBSTATION NAME AND NUMBER	GALLATIN(18)
5.21.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.21.3	CIRCUIT NAME AND NUMBER	GALLATIN(18), Circuit 4, 1804
5.21.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Gallatin
5.21.5	TOTAL CIRCUIT LENGTH (MILES)	6.9
5.21.6	CUSTOMER COUNT FOR THIS CIRCUIT	48
5.21.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	94.00%	94.21%
Member/Public	6.00%	5.79%
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%

5.21.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.022
5.21.10	REPORTING YEAR (SAIDI)	0.116
5.21.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.000
5.21.12	REPORTING YEAR (SAIFI)	0.002

5.21.13 CORRECTIVE ACTION PLAN:

Overall, a short feeder with several industrial loads. Typically is very reliable, and this years reliability is only slightly lower than the reporting average. There were three total outages for the year. Two of those were feeder outages and failed equipment on the line was the cause of those outages.

Action Plan:

Have 2 year inspection cycle with the intent of potentially finding equipment issues before failure.

Circuit # 22

5.22.1	SUBSTATION NAME AND NUMBER	KEITH(13)
5.22.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Owen
5.22.3	CIRCUIT NAME AND NUMBER	KEITH(13), Circuit 2, 1302
5.22.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Elk Lake
5.22.5	TOTAL CIRCUIT LENGTH (MILES)	48.1
5.22.6	CUSTOMER COUNT FOR THIS CIRCUIT	389
5.22.7	DATE OF LAST CIRCUIT TRIM (VM)	2020

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	4.31%	2.66%
Equipment/Installation	0.21%	0.12%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	5.34%	7.28%
Weather	90.14%	89.94%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.22.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.439
5.22.10	REPORTING YEAR (SAIDI)	0.734
5.22.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.006
5.22.12	REPORTING YEAR (SAIFI)	0.008

5.22.13 CORRECTIVE ACTION PLAN:

There were several outages on this feeder, the majority were 1 or 2 member outages, showing a competent sectionalizing plan. There was one feeder outage of which lightning struck and damaged the pole requiring replacement.

Action Plan:

This circuit was recoordinates in 2021, which seems to have been effective in minimizing member exposure to outages.

Circuit # 23

5.23.1	SUBSTATION NAME AND NUMBER	KEITH(13)
5.23.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Owen
5.23.3	CIRCUIT NAME AND NUMBER	KEITH(13), Circuit 1, 1301
5.23.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Owenton
5.23.5	TOTAL CIRCUIT LENGTH (MILES)	87.2
5.23.6	CUSTOMER COUNT FOR THIS CIRCUIT	710
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	6.77%	14.58%
Equipment/Installation	59.81%	4.87%
Member/Public	17.34%	19.85%
R.O.W. Unpreventable	1.18%	6.51%
Scheduled	0.34%	1.79%
Unknown	4.06%	7.60%
Weather	10.24%	43.20%
Age/Deterioration	0.25%	1.58%
R.O.W. Preventable	0.00%	0.00%

5.23.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.920
5.23.10	REPORTING YEAR (SAIDI)	0.451
5.23.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.012
5.23.12	REPORTING YEAR (SAIFI)	0.018

5.23.13 CORRECTIVE ACTION PLAN:

This feeder is fairly long, and overall maintains good reliability. The SAIDI is about half of the 5 year average while the SAIFI is just slightly above. There were numerous single phase outages affecting 1 or 2 members at a time. Overall the main contributor was a feeder outage, which occurred when the feeder was in Hot Line Tag while a contract crew was working on the line. Also, a public incident caused an additional outage.

Action Plan:

Coordination study is planned for 2022, which could help reduce some of the smaller outages by implementing a fuse saving scheme.

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)	East Bend
5.24.5	TOTAL CIRCUIT LENGTH (MILES)	51.2
5.24.6	CUSTOMER COUNT FOR THIS CIRCUIT	624
5.24.7	DATE OF LAST CIRCUIT TRIM (VM)	2020

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	10.69%	1.51%
Equipment/Installation	1.15%	0.21%
Member/Public	0.42%	0.18%
R.O.W. Unpreventable	1.99%	0.40%
Scheduled	0.00%	0.00%
Unknown	7.65%	1.15%
Weather	68.66%	93.59%
Age/Deterioration	1.89%	0.22%
R.O.W. Preventable	7.55%	2.74%

5.24.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	5.023
5.24.10	REPORTING YEAR (SAIDI)	5.885
5.24.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.014
5.24.12	REPORTING YEAR (SAIFI)	0.015

5.24.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder for this time period, that overall closely matches the 5 year historic SAIDI and SAIFI. The majority of the outages are single phase, affecting a minimal amount of members at a time. The vast majority of the SAIDI is from a flooding event that caused several meters to be off for multiple days until the flood waters receded.

Action Plan:

The internal GIS department has made some maps to help find meters that will be affected by flood waters so we are able to disconnect power based on flood stages to prevent any flooding hazards; while this does not prevent an outage, it does increase overall safety of the event.

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)	Eagle Creek
5.25.5	TOTAL CIRCUIT LENGTH (MILES)	77.3
5.25.6	CUSTOMER COUNT FOR THIS CIRCUIT	852
5.25.7	DATE OF LAST CIRCUIT TRIM (VM)	2019

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	0.67%	0.25%
Equipment/Installation	0.07%	0.06%
Member/Public	56.43%	62.39%
R.O.W. Unpreventable	3.75%	1.60%
Scheduled	0.20%	0.11%
Unknown	5.29%	2.70%
Weather	4.96%	3.27%
Age/Deterioration	26.61%	27.50%
R.O.W. Preventable	2.01%	2.13%

5.25.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.469
5.25.10	REPORTING YEAR (SAIDI)	4.360
5.25.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.020
5.25.12	REPORTING YEAR (SAIFI)	0.022

5.25.13 CORRECTIVE ACTION PLAN:

The SAIDI is nearly twice as high as the five year historical average, mainly due to a member caused outage. A car accident caused damage to pole structures and it took several hours to clean the site and be able to restore power.

Action Plan:

This circuit was recoordinates in early 2022, which should help minimize member exposure to outages.

Circuit # 26

5.26.1	SUBSTATION NAME AND NUMBER	CARSON(11)
5.26.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.26.3	CIRCUIT NAME AND NUMBER	CARSON(11), Circuit 2, 1102
5.26.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Carrollton
5.26.5	TOTAL CIRCUIT LENGTH (MILES)	58.9
5.26.6	CUSTOMER COUNT FOR THIS CIRCUIT	609
5.26.7	DATE OF LAST CIRCUIT TRIM (VM)	2019

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	2.51%	0.61%
Equipment/Installation	0.00%	0.00%
Member/Public	34.13%	4.90%
R.O.W. Unpreventable	10.16%	6.44%
Scheduled	0.00%	0.00%
Unknown	7.21%	3.45%
Weather	6.65%	58.73%
Age/Deterioration	0.19%	0.15%
R.O.W. Preventable	39.15%	25.72%

5.26.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	4.741
5.26.10	REPORTING YEAR (SAIDI)	4.791
5.26.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.029
5.26.12	REPORTING YEAR (SAIFI)	0.025

5.26.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder, the vast majority were small single phase outages. There was one feeder outage for the year 2021, due to a fallen ash tree outside of the right of way. Overall this is a well sectionized feeder that reduces outages to the smallest number of members.

Action Plan:

This feeder was recoordinates in 2021, which should help reduce potential outage exposure to members.

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)	MeadowGlen
5.27.5	TOTAL CIRCUIT LENGTH (MILES)	16.8
5.27.6	CUSTOMER COUNT FOR THIS CIRCUIT	922
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	5.84%	8.48%
Equipment/Installation	9.09%	31.15%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	1.59%	1.78%
Scheduled	1.71%	11.54%
Unknown	4.13%	8.59%
Weather	75.87%	36.67%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	1.77%	1.78%

5.27.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.995
5.27.10	REPORTING YEAR (SAIDI)	0.848
5.27.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.015
5.27.12	REPORTING YEAR (SAIFI)	0.026

5.27.13 CORRECTIVE ACTION PLAN:

There were 25 outages on this feeder throughout the year, most were small single phase outages affecting 5 or less members at a time. Most outages were caused by a fuse opening during a weather event. Overall, well sectionized and most outages are minimized to a small number of members.

Action Plan:

Nothing additional at this time.

Circuit # 28

5.28.1	SUBSTATION NAME AND NUMBER	GRIFFIN(9)
5.28.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.28.3	CIRCUIT NAME AND NUMBER	GRIFFIN(9), Circuit 4, 0904
5.28.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	HWY 22
5.28.5	TOTAL CIRCUIT LENGTH (MILES)	66.0
5.28.6	CUSTOMER COUNT FOR THIS CIRCUIT	585
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	9.05%	6.75%
Equipment/Installation	62.83%	59.78%
Member/Public	2.88%	3.93%
R.O.W. Unpreventable	6.28%	5.75%
Scheduled	0.00%	0.00%
Unknown	8.31%	7.23%
Weather	3.83%	9.76%
Age/Deterioration	0.11%	0.15%
R.O.W. Preventable	6.71%	6.65%

5.28.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.615
5.28.10	REPORTING YEAR (SAIDI)	1.172
5.28.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.006
5.28.12	REPORTING YEAR (SAIFI)	0.014

5.28.13 CORRECTIVE ACTION PLAN:

There were several outages on this circuit, all but one was a single phase event. The three phase event was due to a failed connector which caused a phase to fall, opening the feeder breaker.

Action Plan:

Continue two year inspection on lines to potentially find failing equipment.

Circuit # 29

5.29.1	SUBSTATION NAME AND NUMBER	GRIFFIN(9)
5.29.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Pendelton
5.29.3	CIRCUIT NAME AND NUMBER	GRIFFIN(9), Circuit 2, 0902
5.29.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Pendelton
5.29.5	TOTAL CIRCUIT LENGTH (MILES)	37.5
5.29.6	CUSTOMER COUNT FOR THIS CIRCUIT	341
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	44.72%	82.09%
Birds/Animals	0.52%	0.17%
Equipment/Installation	0.00%	0.00%
Member/Public	48.89%	14.17%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.13%	0.03%
Weather	5.74%	3.54%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.29.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.596
5.29.10	REPORTING YEAR (SAIDI)	2.443
5.29.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.29.12	REPORTING YEAR (SAIFI)	0.012

5.29.13 CORRECTIVE ACTION PLAN:

There were 13 outages on this circuit for 2021. The largest individual outage was power provider caused; due to a transmission structure found on inspection that needed replaced. Member outages also caused a significant portion of SAIDI and SAIFI with one outage caused by a member accidentally pushing a tree into the line with a dozer.

Action Plan:

Circuit trim is currently ongoing, which will help reduce potential outages.

Circuit # 30

5.30.1	SUBSTATION NAME AND NUMBER	PENN(7)
5.30.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.30.3	CIRCUIT NAME AND NUMBER	PENN(7), Circuit 3, 0703
5.30.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Corinth
5.30.5	TOTAL CIRCUIT LENGTH (MILES)	57.2
5.30.6	CUSTOMER COUNT FOR THIS CIRCUIT	505
5.30.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	2.00%	1.16%
Equipment/Installation	0.50%	0.59%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	5.84%	5.00%
Scheduled	0.00%	0.00%
Unknown	0.83%	0.63%
Weather	32.22%	52.40%
Age/Deterioration	58.60%	40.22%
R.O.W. Preventable	0.00%	0.00%

5.30.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.558
5.30.10	REPORTING YEAR (SAIDI)	0.671
5.30.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.005
5.30.12	REPORTING YEAR (SAIFI)	0.009

5.30.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder, but there were no three phase outages for 2021. Overall, no consistent reason for outages, mostly weather caused either directly or indirectly.

Action Plan:

The circuit was trimmed in 2021, which should help reduce potential outages going forward.

Circuit # 31

5.31.1	SUBSTATION NAME AND NUMBER	PENN(7)
5.31.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Scott
5.31.3	CIRCUIT NAME AND NUMBER	PENN(7), Circuit 2, 0702
5.31.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Rockdale
5.31.5	TOTAL CIRCUIT LENGTH (MILES)	112.5
5.31.6	CUSTOMER COUNT FOR THIS CIRCUIT	772
5.31.7	DATE OF LAST CIRCUIT TRIM (VM)	2016

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	37.47%	35.20%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	5.19%	7.49%
Scheduled	0.00%	0.00%
Unknown	7.67%	10.27%
Weather	12.26%	19.01%
Age/Deterioration	28.44%	10.65%
R.O.W. Preventable	8.95%	17.39%

5.31.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.544
5.31.10	REPORTING YEAR (SAIDI)	1.511
5.31.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.012
5.31.12	REPORTING YEAR (SAIFI)	0.020

5.31.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder, all were single phase outages, with the majority only affecting 1 or 2 members at a time. Many of these were small transformer outages caused by wildlife.

Action Plan:

Overall this circuit remains well sectionalized and keeps outages to a minimum, no additional plans at this time.

Circuit # 32

5.32.1	SUBSTATION NAME AND NUMBER	BROMLEY(6)
5.32.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Owen
5.32.3	CIRCUIT NAME AND NUMBER	BROMLEY(6), Circuit 1, 0601
5.32.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Gallatin
5.32.5	TOTAL CIRCUIT LENGTH (MILES)	98.7
5.32.6	CUSTOMER COUNT FOR THIS CIRCUIT	934
5.32.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	17.24%	15.35%
Equipment/Installation	0.25%	0.29%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.08%	0.04%
Scheduled	2.58%	3.81%
Unknown	5.16%	2.73%
Weather	69.61%	75.34%
Age/Deterioration	0.08%	0.09%
R.O.W. Preventable	5.00%	2.36%

5.32.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.122
5.32.10	REPORTING YEAR (SAIDI)	2.355
5.32.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.014
5.32.12	REPORTING YEAR (SAIFI)	0.019

5.32.13 CORRECTIVE ACTION PLAN:

This is a rural feeder that had numerous outages, by a variety of causes. Most of the outages were contained in number of members affected. There was one feeder outage lasting a couple of hours due to a weather event, which contributed to the SAIDI and SAIFI for the reporting period.

Action Plan:

Some "Hot Spot" tree trimming was done in early 2022, to help reduce some outage exposure.

Circuit # 33

5.33.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN(5)
5.33.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.33.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN(5), Circuit 7, 0507
5.33.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Barnes Rd
5.33.5	TOTAL CIRCUIT LENGTH (MILES)	58.5
5.33.6	CUSTOMER COUNT FOR THIS CIRCUIT	990
5.33.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

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	4.77%	4.22%
Equipment/Installation	0.24%	0.23%
Member/Public	0.04%	0.05%
R.O.W. Unpreventable	0.28%	0.28%
Scheduled	0.00%	0.00%
Unknown	3.59%	5.08%
Weather	48.32%	59.78%
Age/Deterioration	1.85%	4.38%
R.O.W. Preventable	39.61%	18.89%

5.33.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.099
5.33.10	REPORTING YEAR (SAIDI)	2.269
5.33.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.018
5.33.12	REPORTING YEAR (SAIFI)	0.039

5.33.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder, most being under 10 members affected. There were two feeder outages, however, that mainly contributed to SAIDI and SAIFI. They both were mostly tied to weather events.

Action Plan:

The circuit had a vegetation spray applied to help reduce vegetation growing into distribution lines.

Circuit # 34

5.34.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN(5)
5.34.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.34.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN(5), Circuit 4, 0504
5.34.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Salem Pike
5.34.5	TOTAL CIRCUIT LENGTH (MILES)	35.1
5.34.6	CUSTOMER COUNT FOR THIS CIRCUIT	313
5.34.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	20.85%	10.82%
Equipment/Installation	4.68%	3.56%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	11.49%	8.97%
Weather	0.43%	0.61%
Age/Deterioration	57.45%	73.98%
R.O.W. Preventable	5.11%	2.06%

5.34.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.204
5.34.10	REPORTING YEAR (SAIDI)	0.399
5.34.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.002
5.34.12	REPORTING YEAR (SAIFI)	0.004

5.34.13 CORRECTIVE ACTION PLAN:

Historically this feeder does not have many outage minutes associated with it. This year the SAIDI and SAIFI are fairly consistent with the five year average, just slightly higher. All the outages were single phase , but there was one wire break that contributed to over half of the SAIDI and SAIFI for the period.

Action Plan:

Continue 2 year line inspection to potentially find issues that may lead to future outages.

Circuit # 35

5.35.1	SUBSTATION NAME AND NUMBER	WILLIAMSTOWN(5)
5.35.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Grant
5.35.3	CIRCUIT NAME AND NUMBER	WILLIAMSTOWN(5), Circuit 2, 0502
5.35.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Cordova Mason
5.35.5	TOTAL CIRCUIT LENGTH (MILES)	68.4
5.35.6	CUSTOMER COUNT FOR THIS CIRCUIT	625
5.35.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	8.99%	5.27%
Equipment/Installation	56.54%	58.90%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.36%	0.17%
Weather	30.01%	33.50%
Age/Deterioration	3.83%	2.04%
R.O.W. Preventable	0.00%	0.00%

5.35.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.728
5.35.10	REPORTING YEAR (SAIDI)	2.068
5.35.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.009
5.35.12	REPORTING YEAR (SAIFI)	0.017

5.35.13 CORRECTIVE ACTION PLAN:

Overall this feeder had 20 outages for the reporting period, the main contributor to SAIDI and SAIFI was an insulator failure outside of the substation which caused a nearly two hour outage for the feeder members.

Action Plan:

Continue two year line inspection to try to find potential issues. Additionally, a sectionalizing plan is scheduled to take place in 2022.

Circuit # 36

5.36.1	SUBSTATION NAME AND NUMBER	MUNK(4)
5.36.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.36.3	CIRCUIT NAME AND NUMBER	MUNK(4), Circuit 4, 0404
5.36.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Walnut Lick
5.36.5	TOTAL CIRCUIT LENGTH (MILES)	39.8
5.36.6	CUSTOMER COUNT FOR THIS CIRCUIT	442
5.36.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	24.14%	10.26%
Equipment/Installation	3.17%	1.11%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	6.07%	4.99%
Scheduled	10.21%	6.79%
Unknown	3.59%	2.07%
Weather	16.76%	17.91%
Age/Deterioration	0.14%	0.22%
R.O.W. Preventable	35.93%	56.66%

5.36.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.686
5.36.10	REPORTING YEAR (SAIDI)	2.891
5.36.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.014
5.36.12	REPORTING YEAR (SAIFI)	0.023

5.36.13 CORRECTIVE ACTION PLAN:

This feeder had numerous outages throughout the year, mainly smaller single phase outages. The largest single contributor however, was due to a tree in the right of way causing an extended outage for the majority of the members on this feeder.

Action Plan:

A circuit trim "Hot Spot" was completed in early 2022 to help reduce right of way outages.

Circuit # 37

5.37.1	SUBSTATION NAME AND NUMBER	MUNK(4)
5.37.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.37.3	CIRCUIT NAME AND NUMBER	MUNK(4), Circuit 3, 0403
5.37.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Spencer Rd
5.37.5	TOTAL CIRCUIT LENGTH (MILES)	52.9
5.37.6	CUSTOMER COUNT FOR THIS CIRCUIT	706
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	0.16%	0.16%
Equipment/Installation	0.16%	0.12%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	2.10%	6.59%
Scheduled	0.00%	0.00%
Unknown	78.02%	44.23%
Weather	2.74%	8.95%
Age/Deterioration	0.05%	0.26%
R.O.W. Preventable	16.77%	39.68%

5.37.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.778
5.37.10	REPORTING YEAR (SAIDI)	1.086
5.37.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.025
5.37.12	REPORTING YEAR (SAIFI)	0.029

5.37.13 CORRECTIVE ACTION PLAN:

Twenty Seven outages occurred on this feeder for 2021, which is approximately the same number as the historic average, there was one large outage though, that significantly increased the SAIDI for the year. A fault with an unknown cause removed the 706 members from service for over 30 minutes while the outage was diagnosed and re-energized.

Action Plan:

A circuit trim is currently underway, which will help reduce right of way outages.

Circuit # 38

5.38.1	SUBSTATION NAME AND NUMBER	MUNK(4)
5.38.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Gallatin
5.38.3	CIRCUIT NAME AND NUMBER	MUNK(4), Circuit 2, 0402
5.38.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Napoleon
5.38.5	TOTAL CIRCUIT LENGTH (MILES)	28.9
5.38.6	CUSTOMER COUNT FOR THIS CIRCUIT	333
5.38.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	9.85%	12.78%
Equipment/Installation	0.00%	0.00%
Member/Public	1.37%	0.68%
R.O.W. Unpreventable	38.49%	9.01%
Scheduled	0.00%	0.00%
Unknown	38.49%	36.32%
Weather	10.77%	40.09%
Age/Deterioration	0.23%	0.27%
R.O.W. Preventable	0.80%	0.85%

5.38.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.674
5.38.10	REPORTING YEAR (SAIDI)	1.036
5.38.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.004
5.38.12	REPORTING YEAR (SAIFI)	0.014

5.38.13 CORRECTIVE ACTION PLAN:

There were numerous single phase outages, but the main cause for SAIDI and SAIFI for this reporting period were a couple of feeder outages that removed all 333 members from service for over an hour.

Action Plan:

Coordination study to occur in 2022 to help reduce number of feeder outages and time of restoration.

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 1, 0401
5.39.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Concord Rd
5.39.5	TOTAL CIRCUIT LENGTH (MILES)	24.6
5.39.6	CUSTOMER COUNT FOR THIS CIRCUIT	416
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	9.12%	5.23%
Equipment/Installation	0.00%	0.00%
Member/Public	62.66%	61.31%
R.O.W. Unpreventable	3.18%	3.33%
Scheduled	0.00%	0.00%
Unknown	0.00%	0.00%
Weather	25.04%	30.12%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.39.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.508
5.39.10	REPORTING YEAR (SAIDI)	1.282
5.39.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.007
5.39.12	REPORTING YEAR (SAIFI)	0.011

5.39.13 CORRECTIVE ACTION PLAN:

Seventeen outages occurred for this reporting period, all but one of those were single phase outages affecting minimal members. The one multi-phase outage was caused by a member of the public damaging a structure.

Action Plan:

Sectionalizing seems adequate on this circuit, no additional plans at this time.

Circuit # 40

5.40.1	SUBSTATION NAME AND NUMBER	GRANTSLICK(3)
5.40.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Campbell
5.40.3	CIRCUIT NAME AND NUMBER	GRANTSLICK(3), Circuit 4, 0304
5.40.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Demossville
5.40.5	TOTAL CIRCUIT LENGTH (MILES)	63.0
5.40.6	CUSTOMER COUNT FOR THIS CIRCUIT	649
5.40.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	31.73%	12.73%
Equipment/Installation	0.00%	0.00%
Member/Public	4.02%	4.80%
R.O.W. Unpreventable	6.83%	14.75%
Scheduled	13.65%	14.48%
Unknown	9.04%	7.08%
Weather	34.34%	46.02%
Age/Deterioration	0.40%	0.14%
R.O.W. Preventable	0.00%	0.00%

5.40.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.667
5.40.10	REPORTING YEAR (SAIDI)	0.830
5.40.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.010
5.40.12	REPORTING YEAR (SAIFI)	0.008

5.40.13 CORRECTIVE ACTION PLAN:

There were numerous outages on this feeder for 2021, but all of them were single phase outages with the majority affecting a couple of members at a time, showing an adequate sectionizing plan.

Action Plan:

This circuit was sectionized in 2021, which can help with additional reliability.

Circuit # 41

5.41.1	SUBSTATION NAME AND NUMBER	BANKLICK(2)
5.41.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.41.3	CIRCUIT NAME AND NUMBER	BANKLICK(2), Circuit 5, 0205
5.41.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Bramlage Rd
5.41.5	TOTAL CIRCUIT LENGTH (MILES)	13.0
5.41.6	CUSTOMER COUNT FOR THIS CIRCUIT	203
5.41.7	DATE OF LAST CIRCUIT TRIM (VM)	2020

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	7.27%	9.09%
Equipment/Installation	0.36%	0.57%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	9.09%	6.06%
Weather	74.18%	75.13%
Age/Deterioration	9.09%	9.15%
R.O.W. Preventable	0.00%	0.00%

5.41.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.215
5.41.10	REPORTING YEAR (SAIDI)	0.353
5.41.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.003
5.41.12	REPORTING YEAR (SAIFI)	0.004

5.41.13 CORRECTIVE ACTION PLAN:

This is a fairly short, relatively reliable circuit. There were 8 outages that affected 25 members or less, but the main contributor to SAIDI and SAIFI was a three phase feeder outage lasting about an hour. It was caused due to high winds in the area.

Action Plan:

None at this time.

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 3, 0203
5.42.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Bird Rd
5.42.5	TOTAL CIRCUIT LENGTH (MILES)	38.5
5.42.6	CUSTOMER COUNT FOR THIS CIRCUIT	424
5.42.7	DATE OF LAST CIRCUIT TRIM (VM)	2021

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	4.17%	0.76%
Equipment/Installation	4.64%	3.50%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.00%	0.00%
Scheduled	0.00%	0.00%
Unknown	0.07%	0.15%
Weather	62.10%	76.42%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	29.03%	19.17%

5.42.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.415
5.42.10	REPORTING YEAR (SAIDI)	0.794
5.42.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.014
5.42.12	REPORTING YEAR (SAIFI)	0.023

5.42.13 CORRECTIVE ACTION PLAN:

This feeder had a few feeder outages that caused the SAIFI to be slightly higher than the 5 year average, while the SAIDI was a little less than half of the 5 year average. Mainly trees falling into the three phase outside of the sub, causing the feeder breaker to open is what added to the SAIFI minutes.

Action Plan:

Circuit Trim was completed in 2021, which will help reduce potential right of way outages in the future.

Circuit # 43

5.43.1	SUBSTATION NAME AND NUMBER	BANKLICK(2)
5.43.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Kenton
5.43.3	CIRCUIT NAME AND NUMBER	BANKLICK(2), Circuit 1, 0201
5.43.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Fowler Creek
5.43.5	TOTAL CIRCUIT LENGTH (MILES)	18.8
5.43.6	CUSTOMER COUNT FOR THIS CIRCUIT	973
5.43.7	DATE OF LAST CIRCUIT TRIM (VM)	2018

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	3.85%	2.62%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	23.70%	19.96%
Scheduled	0.00%	0.00%
Unknown	0.15%	0.10%
Weather	71.85%	76.27%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.47%	1.05%

5.43.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	1.330
5.43.10	REPORTING YEAR (SAIDI)	4.068
5.43.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.016
5.43.12	REPORTING YEAR (SAIFI)	0.063

5.43.13 CORRECTIVE ACTION PLAN:

There were several outages that occurred on this feeder, but mainly two outages were the cause for nearly all the outage minutes for this reporting period. The first being a tree on the line just outside the substation, and the other was a high wind event, which opened the feeder breaker and took about an hour to diagnose until the line could be re-energized.

Action Plan:

This feeder is planned to have a sectionlizing study completed in 2022, which will potentially reduce member exposure to outages.

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 5, 0105
5.44.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Long Branch Rd
5.44.5	TOTAL CIRCUIT LENGTH (MILES)	25.1
5.44.6	CUSTOMER COUNT FOR THIS CIRCUIT	1512
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	1.40%	0.60%
Equipment/Installation	1.04%	0.52%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	93.54%	96.18%
Scheduled	1.16%	0.63%
Unknown	2.13%	1.31%
Weather	0.06%	0.05%
Age/Deterioration	0.06%	0.15%
R.O.W. Preventable	0.61%	0.55%

5.44.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	2.452
5.44.10	REPORTING YEAR (SAIDI)	1.986
5.44.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.021
5.44.12	REPORTING YEAR (SAIFI)	0.026

5.44.13 CORRECTIVE ACTION PLAN:

Fourteen outages for this reporting period. There were two, three phase outages, one was a small, scheduled outage, while the other was the main contributor to SAIFI and SAIDI, with the SAIDI for this reporting period being under the 5 year average.

Action plan:
 This feeder had a vegetation spray applied in 2021, to help reduce vegetation growing into the distribution line potentially causing outages.

Circuit # 45

5.45.1	SUBSTATION NAME AND NUMBER	BOONE(1)
5.45.2	SUBSTATION LOCATION (COUNTY-ROAD-TOWN)	Boone
5.45.3	CIRCUIT NAME AND NUMBER	BOONE(1), Circuit 1, 0101
5.45.4	CIRCUIT LOCATION (TOWN-ROAD-GENERAL AREA)	Setters Rd
5.45.5	TOTAL CIRCUIT LENGTH (MILES)	29.1
5.45.6	CUSTOMER COUNT FOR THIS CIRCUIT	343
5.45.7	DATE OF LAST CIRCUIT TRIM (VM)	2017

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	4.31%	2.72%
Equipment/Installation	0.00%	0.00%
Member/Public	0.00%	0.00%
R.O.W. Unpreventable	0.16%	0.41%
Scheduled	0.00%	0.00%
Unknown	61.40%	28.71%
Weather	34.13%	68.16%
Age/Deterioration	0.00%	0.00%
R.O.W. Preventable	0.00%	0.00%

5.45.9	CIRCUIT 5 YEAR AVERAGE (SAIDI)	0.814
5.45.10	REPORTING YEAR (SAIDI)	0.948
5.45.11	CIRCUIT 5 YEAR AVERAGE (SAIFI)	0.008
5.45.12	REPORTING YEAR (SAIFI)	0.010

5.45.13 CORRECTIVE ACTION PLAN:

Numerous outages occurred on this feeder, most are single phase outages affecting a minimal amount of members at a time. There was one three phase outage that contributed to the majority of the SAIDI and SAIFI, its final cause was not found in the field, but did contribute to a 45 minute outage on all members of the circuit.

Action Plan:

Modified settings on some electronic reclosers to further insure proper coordination of the circuit, helping to mitigate potential outage effects on members.

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

Owen Electric's trim cycle prioritizes feeders that have the oldest trim date, have the most work requests for tree work and also are the worst performing in terms of reliability. Two years following the trimming and mowing cycle a low volume herbicide treatment is performed to control undesirable brush in the right of ways. One year after a feeder is sprayed, we perform a mid-cycle hotspot trim; this typically addresses yard trees that have vigorously re-sprouted and hazard trees that have developed since the last trim cycle.

KENTUCKY PUBLIC SERVICE COMMISSION

SECTION 7: UTILITY COMMENTS

During the course of 2021 OEC continued to support several initiatives designed to minimize the extent of outages and speed in the restoration of outages caused by weather. OEC has implemented an ongoing over-current protection review of each feeder. A five year plan was in place in 2018 to review all feeders sectionalizing plans.

A three year plan was put in place in 2018 to replace all hydraulic reclosers on the feeder to electronic, this was mostly complete by the end of 2020 and has been fully realized in 2021.

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

OEC continues working on future plans to address other feeders with plans for a new substation 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.