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of Service

April 23, 2020

Ms. Rosemary Chiavetta
Pennsylvania Public Utility Commission
PO Box 3265
Harrisburg, PA 17105-3265

RE: Docket No. M-2016-2522508 – Annual Reliability Report

Dear Secretary Chiavetta,

Enclosed please find the 2019 Annual Reliability Report for Citizens' Electric Company. Please contact me at 570-522-6143 or johnsonn@citizenselectric.com if I can answer any questions.

Best Regards,

A handwritten signature in black ink, appearing to read "Nathan Johnson", written over a light blue horizontal line.

Nathan Johnson, PE

Sr. Director of Engineering & Operations

cc: Dan Searfoorce (via email)
Dave Washko (via email)

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Serving the Wonderful Lewisburg-Buffalo Valley since 1911

Citizens' Electric Company
Annual Electric Service Reliability Report
2019

Prepared by Nathan Johnson, PE
Sr. Director of Engineering & Operations
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04/23/2020

§ 57.195(b)(1) - An overall current assessment of the state of the system reliability in the EDC's service territory including a discussion of the EDC's current programs and procedures for providing reliable electric service.

Overall, Citizens' Electric saw a slight downward trend in reliability indices from 2018 to 2019. These figures, however, are within typical levels for the company, and do not represent a substantial change in customer experience. As discussed further in the Outage Analysis section, the year's performance was greatly impacted by an approximately 6-week period of higher outage activity.

While not reflected in reported indices—as an excluded 'major event'—the Company experienced its second most severe weather event on record in terms of overall customer impact. The event began on April 15th, when an EF-1 tornado, accompanied by wider spread severe winds, heavy rain and hail, touched down and traveled nearly two miles through the geographical center of the Company's territory. The 'area of most intense damage,' as reported by the National Weather Service, encompassed the entirety of the Company's service area. Despite this, all customers were restored in less than two days, with over 90% restored within the first 12 hours. This was accomplished by mobilizing crews from affiliates within C&T Enterprises and staggering shifts to provide 24/7 manpower for restoration. Due to Citizens' relatively small footprint, storms of this magnitude are rare for the Company. The quick overall restoration, speedy mobilization of mutual aid, and exceptional performance of internal staff, however, demonstrate the Company's preparation and training efforts, and persistent readiness for such events.

The Company again continued its commitment to a responsible vegetation management program as evidenced by its 17th consecutive year to be recognized as a "Tree Line USA" utility by the National Arbor Day Foundation. This award recognizes utilities for their use of nationally approved trimming techniques and vegetation management procedures. Of particular value within the Company's 'Tree Line' effort is its annual educational session hosted in cooperation with the Penn State Extension. This event provides education not only for Company employees, but also the current vegetation management contractor, and local municipal road and public works crews. Topics covered include directional pruning techniques, 'Right Tree in the Right Place' planning, and updates on current and expected threats to Pennsylvania forests. By inviting local municipalities, we encourage cooperative relationships, as well as garner the mutual benefits of consistent vegetation management practices throughout the area.

The Company continues to evaluate, compare and improve its practices through participation in a variety of industry peer groups. Its unique connection to both the rural electric and investor owned utility groups allow staff to tap a wide knowledge base, including the Pennsylvania Rural Electric Association, the Energy Association of Pennsylvania, the National Rural Electric Cooperative Association and the International Association of Arboriculture.

Citizens' Electric Company does not own or maintain any transmission facilities.

Current Maintenance Program		
Program	Description	Cycle
Infrared Inspection	All substation equipment biennially, and 1/3 of all overhead lines each year.	3 years
Vegetation Management	Each year, all primary lines are visually inspected. This comprehensive field inspection allows us to identify areas that require trimming. We maintain a 4-year trimming cycle, but all areas are inspected annually to help identify unexpected “hot spots.” All areas needing attention are trimmed by the end of the 3 rd quarter.	Annual
Visual Line Inspection	All distribution lines and pole hardware are visually inspected during preparation of tree trimming contract. Line sections receiving infrared inspection are also inspected visually during that process.	Annual
Padmount Equipment Inspection	Padmounted equipment is visually inspected to identify and correct any developing problems or safety concerns.	4 Years
3Ø Padmount Transformer Oil Test	Insulating oil is tested from every 3Ø padmounted transformer on our system, and all substation power transformers.	Annual
Line Equipment Inspection	All air switches, circuit tie switches, capacitors, regulators, and reclosers are visually inspected. Where applicable, proper operation of control equipment is verified and counter readings are recorded.	Annual
Pole Inspection and Treatment	Poles are inspected and treated at the ground line. External and/or internal decay inhibitors are applied where appropriate.	10 Years
Danger & Reject Pole Replacements	Replace condemned poles identified during pole inspection.	As needed, annually
Substation Equipment Inspection	Entire station is visually inspected. Equipment batteries are tested, communications equipment operation is verified, fans are tested, various gauge and counter readings are recorded. An infrared inspection is performed on all equipment twice a year.	Monthly
Recloser Maintenance	Change oil, check and adjust mechanism, check contacts, test operation.	5 Years

§ 57.195(b)(2) - A description of each major event that occurred during the year being reported on, including the time and duration of the event, the number of customers affected, the cause of the event and any modified procedures adopted to avoid or minimize the impact of similar events in the future.

Date	Time	Duration (Minutes)	Customers Affected	Cause
1/8/2019	6:25 PM	153	1,811	While restoring circuits to normal configuration, a lightning arrestor failed when re-energized, causing a substation recloser to lock out, interrupting all of the Rt 45 Distribution line, as well as 369 customers transferred to it from an adjacent circuit.
4/15/2019	12:37 AM	2,342	2,695	An EF-1 tornado touched down within Citizens' Electric service area and traveled approximately 1.8 miles, accompanied by severe winds throughout the service area.
5/29/2019	4:04 PM	522	1,379	A severe storm producing winds in excess of 80mph, accompanied by lightning and heavy rain crossed the Citizens' Electric service area.
6/26/2019	4:44 PM	76	868	A severe storm blew debris into a 3ph distribution line, interrupting the entire circuit.
9/11/2019	4:13 PM	374	1,114	A strong storm cell developed to the northwest of Citizens' service area, tracking east-southeast. The storm produced heavy rain and damaging winds, measured at 58mph as it passed over Citizens' headquarters. As the storm moved through, scattered outages were reported across the service area, including one of the nine distribution circuits tripping to lockout. The majority of damage was reported as due to tree limbs broken free and propelled into lines by the winds.

§ 57.195(b)(3) - A table showing the actual values of each of the reliability indices (SAIFI, CAIDI, SAIDI, and if available, MAIFI) for the EDC's service territory for each of the preceding 3 calendar years. The report shall include the data used in calculating the indices, namely the average number of customers served, the number of sustained customer minutes interruptions, the number of customers affected and the minutes of interruption. If MAIFI values are provided, the number of customer momentary interruptions shall also be reported.

Prior 3 Years Reliability Indices							
Year	SAIFI	SAIDI	CAIDI	Avg # of Customers Served	# of Interruptions	# of Customers Interrupted	Customer Interruption Minutes
2019	0.28	22	78	7060	59	1,982	154,257
2018	0.21	16	76	7,056	49	1,449	109,478
2017	0.45	84	185	7,035	58	3,180	588,067

§ 57.195(b)(4) - A breakdown and analysis of outage causes during the year being reported on, including the number and percentage of service outages, the number of customers interrupted, and customer interruption minutes categorized by outage cause such as equipment failure, animal contact, tree related, and so forth. Proposed solutions to identified service problems shall be reported.

Outage Analysis by Cause				
Outage Cause	Number of Interruptions	% of Interruptions	Number of Customers Affected	Customer Interruption Minutes
Off R/W Trees	15	25%	1,068	80,968
On R/W Trees	5	8%	144	15,473
Animal	11	19%	149	7,460
Weather	6	10%	124	12,676
Equipment	19	32%	465	33,555
Vehicle	1	2%	17	3,379
Other	2	3%	15	746
Total	59		1,982	154,257

As mentioned in the overall assessment, Citizens’ customers experienced a slight decline in reliability in 2019 compared to 2018. This can be primarily attributed to the months of February and March, which accounted for approximately half of all customer minutes interrupted during the year. This stormy late winter season caused a number of long duration outages, largely related to off-ROW trees. Outside of this period, the remainder of the year followed a relatively steady and less impactful outage trend.

Trees were again the most impactful cause of outages in 2019. Accounting for 33% of total outages, but over 60% of customer minutes interrupted. The company continues to emphasize hazard tree identification and removal with employees, tree contractors and customers. The volume of such trees, however, combined with the inherent difficulties in identifying and predicting the potential impact of individual trees, remains a significant challenge. Over the past year, the Company has seen a shift in tree-related outages. As the trees killed by the Emerald Ash Borer have been largely identified and removed or fallen due to decay, their impact has lessened. The emerging challenge is that of apparently healthy trees uprooting in saturated soil, or due to root decay exacerbated by the exceptionally wet spring and summer of 2018. These trees show no observable signs of failure, making them a challenge for proactive removal. Citizens’ personnel and tree contractors have shifted hazard tree removal to areas prone to uprooting, such as side-banks and drainage areas.

The Company continues to build its system to standards that typically exceed the NESC and to monitor industry best-practices regarding storm-hardening. New equipment, techniques and trends will be evaluated for their benefit to reliability.

§ 57.195(b)(6) - A comparison of established transmission and distribution inspection and maintenance goals/objectives versus actual results achieved during the year being reported on. Explanations of any variances shall be included.

Program	Goal	Completed	Comment
Infrared Inspection	Substation and 1/3 of all overhead lines	100%	Substation, all three phase line and 1/3 of single phase line inspected.
Vegetation Management	Entire System (9 circuits), as needed	100%	9 circuits inspected, trimmed as needed.
Visual Line Inspection	Entire System (9 circuits)	100%	9 circuits inspected.
Padmount Equipment Inspection	185	100%	180 locations inspected. Quantity revised to reflect actual quantity in service at time of inspection.
3Ø Padmount Transformer Oil Test	44	100%	44 transformers tested.
Line Equipment Inspection	156	100%	156 locations inspected. <ul style="list-style-type: none"> • 22 Capacitors • 48 Reclosers • 12 Regulators • 74 Switches
Pole Inspection and Treatment	832	100%	898 Poles Inspected. Quantity revised to reflect the actual quantity of poles in service at time of inspection.
Danger and Reject Pole Replacement	“Danger” poles identified: 2 “Reject” poles identified: 13	19%	2 “danger” poles replaced, and 7 “rejects” replaced. Remaining engineered and scheduled for replacement within 12 months of inspection date.
Substation Equipment Inspection	12 Monthly Inspections	100%	12 inspections completed.
Recloser Maintenance	10 Reclosers	100%	Completed maintenance on 10 units.

§ 57.195(b)(7) - A comparison of budgeted versus actual transmission and distribution operation and maintenance expenses for the year being reported on in total and detailed by the EDC's own functional account code or FERC account code as available. Explanations of any variances 10% or greater shall be included.

Program	Budget \$	Actual \$	Comment
Infrared Inspection		7,310	Not budgeted individually. 100% completed.
Vegetation Management	183,000	130,698	Contractor incorrectly calculated bid, resulting in highly favorable pricing for Company. 100% completed.
Visual Line Inspection			Not budgeted individually, included in Vegetation Management accounting. 100% completed.
Padmount Equipment Inspection		8,673	Not budgeted individually. 100% completed.
3Ø Padmount Transformer Oil Test		3,867	Not budgeted individually. 100% Completed.
Line Equipment Inspection		14,406	Not budgeted individually. 100% completed.
Pole Inspection and Treatment	36,200	32,599	100% completed. Variance within 10% of budget amount.
Substation Equipment Inspection		4,251	Not budgeted individually. 100% completed.
Recloser Maintenance		6,447	Not budgeted individually. 100% completed.
Total		208,251	

§ 57.195(b)(8) - A comparison of budgeted versus actual transmission and distribution capital expenditures for the year being reported on in total and detailed by the EDC's own functional account code or FERC account code as available. Explanations of any variances 10% or greater shall be included.

Project	Budget Amount \$	Actual Expenditures \$	Variance \$	Comment
General Construction	842,614	850,486	7,872	
Transformers	84,343	69,070	-15,273	Transformer order expected in December was not received until 2020.
Meters	190,472	167,387	-23,085	Planned meter replacements goal met at lower than expected meter cost.
Rt 15 Rebuild	163,381	130,430	-32,951	Portion of project scope deferred to 2020 in order to offset cost of scope change on Moore Rebuild
Moore Rebuild	59,559	170,768	111,209	Several factors contributed to overrun: Record rainfall forced frequent multiple setup/teardowns at individual work locations, also prevented trucks from parking off road, greatly increasing traffic control costs. Significant temporary service work added to maintain service to customers while pulling wire.
S 16 th /17 th St UG Cable Replacement	40,287	50,927	10,640	Overrun due to additional restoration work required for customers.
Total	1,380,656	1,439,068	58,412	

§ 57.195(b)(9) - Quantified transmission and distribution inspection and maintenance goals/objectives for the current calendar year detailed by system area (that is, transmission, substation and distribution).

Program	Goal
Infrared Inspection	Substation and 3 circuits
Vegetation Management	Entire System (9 circuits), as needed
Visual Line Inspection	Entire System (9 circuits)
Padmount Equipment Inspection	185 Locations
3Ø Padmount Transformer Oil Test	44 Transformers
Line Equipment Inspection	156 Locations
Pole Inspection and Treatment	832 Poles
Danger and Reject Poles	To be determined from pole inspections
Substation Equipment Inspection	12 Monthly Inspections
Recloser Maintenance	10 Reclosers

All goals are in the substation and distribution areas. The Company does not own or operate any transmission facilities.

§ 57.195(b)(10) - Budgeted transmission and distribution operation and maintenance expenses for the current year in total and detailed by the EDC's own functional account code or FERC account code as available.

(These items are not budgeted by FERC account.)

Program	Budget \$	Comment
Infrared Inspection	N/A	Not budgeted individually
Vegetation Management	\$183,000	
Visual Line Inspection	N/A	Not budgeted individually
Padmount Transformer Inspection	N/A	Not budgeted individually
3Ø Padmount Transformer Oil Test	\$3,500 (estimated)	Not budgeted individually
Line Equipment Inspection	N/A	Not budgeted individually
Pole Inspection and Treatment	\$36,200	
Danger and Reject Poles	N/A	Not budgeted individually
Substation Equipment Inspection	N/A	Not budgeted individually
Recloser Maintenance	N/A	Not budgeted individually
Total		

§ 57.195(b)(11) - Budgeted transmission and distribution capital expenditures for the current year in total and detailed by the EDC's own functional account code or FERC account code as available.

(These items are not budgeted by FERC account.)

Project	Budget Amount \$
General Construction	842,614
Transformers	84,343
Meters	190,472
Rt 15 Rebuild	163,381
Moore Rebuild	59,559
S 16 th /17 th St UG Cable Replacement	40,287
Total	1,380,656

§ 57.195(b)(12) - Significant changes, if any, to the transmission and distribution inspection and maintenance programs previously submitted to the Commission.

No significant changes.