



Over a Century  
of Service

April 25<sup>th</sup>, 2019

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 2018 Annual Reliability Report for Citizens' Electric Company. Please contact me at 570-522-6143 or [johnsonn@citizenselectric.com](mailto: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)

1775 Industrial Blvd., Lewisburg, PA 17837  
570-524-2231 ♦ [www.citizenselectric.com](http://www.citizenselectric.com) ♦ Fax 570-524-5887

*Serving the Wonderful Lewisburg-Buffalo Valley since 1911*

Citizens' Electric Company  
Annual Electric Service Reliability Report  
2018

Prepared by Nathan Johnson, PE  
Sr. Director of Engineering & Operations  
570-522-6143  
[johnsonn@citizenselectric.com](mailto:johnsonn@citizenselectric.com)  
04/25/2018

**§ 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.**

Citizens' Electric Company saw a recovery in its reliability indices from a storm heavy 2017 to a more moderate 2018. The Company still did see notable outages resulting from an especially wet summer and fall. These wet conditions led to saturated ground—causing numerous outages due to off right-of-way trees—and aggressive tree growth. Overall this led to a slight increase in the volume of tree related outages; the total minutes interrupted as a result, however, were reduced significantly. The Company will continue to aggressively identify and remove off right-of-way hazard trees and is expanding its distribution tree clearances in 2019 to further reduce these outages.

The Company's commitment to a responsible vegetation management program is evidenced by its 16<sup>th</sup> 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.

Citizens' Electric expanded its utilization of mobile technology in 2018 to include 4G connected tablets, allowing for updates to outages, inspections and workflows while crews are in the field. With the implementation of this technology, a mobile meter exchange workflow was introduced, and includes service inspection tasks for every meter replaced.

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.

<b>Current Maintenance Program</b>		
<b>Program</b>	<b>Description</b>	<b>Cycle</b>
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 <sup>rd</sup> 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.**

<b>Date</b>	<b>Time</b>	<b>Duration (Minutes)</b>	<b>Customers Affected</b>	<b>Cause</b>
3/2/2018	9:07 AM	1,417	1,541	Winter storm Riley brought a period of rain, high wind and snow through the region on March 1st and 2nd. The Company measured 1.12 inches of rain, followed by wind gusts exceeding 40 mph and ending with a period of heavy wet snow. Numerous trees were uprooted or broken across the territory as the storm progressed, causing scattered outages throughout the day.
5/15/2018	2:42 PM	284	2,535	Strong storms moved across the state causing multiple outages across Citizens' territory. The Company recorded a peak wind gust of 45 mph and a rainfall rate of 1.57 in/hr.
7/21/2018	7:25 PM	90	1,026	A large ash tree from approximately 25ft outside the right-of-way fell during a period of extended heavy rainfall.
8/4/2018	12:28 AM	74	1,022	A large ash tree from approximately 25ft outside the right-of-way fell during a period of heavy rainfall.
9/10/2018	2:51 AM	124	2,172	During a period of steady rainfall, a racoon climbed over existing animal guard onto the energized 12kV substation bus, then contacted another phase, causing a fault that expanded to the remaining phase and ground. The fault resulted in the operation of 69kV transformer fuses, de-energizing one bus section and its three connected distribution circuits.
11/15/2018	10:19 PM	800	7,036	A period of wet heavy snow and ice accumulation cause outages across the Citizen's Electric territory, as well as interrupting both transmission sources from PPL.

**§ 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
2018	0.21	16	76	7,056	49	1,449	109,478
2017	0.45	84	185	7,035	58	3,180	588,067
2016	0.26	28	108	6,963	52	1,787	192,235

**§ 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.**

<b>Outage Analysis by Cause</b>				
<b>Outage Cause</b>	<b>Number of Interruptions</b>	<b>% of Interruptions</b>	<b>Number of Customers Affected</b>	<b>Customer Interruption Minutes</b>
On R/W Trees	3	6	59	5,065
Animals	7	14	262	7,583
Equipment	18	37	274	28,930
Off R/W Trees	13	27	511	27,638
Weather	6	12	311	37,677
Vehicle	0	0	0	0
Other	2	4	32	2,585
<b>Total</b>	<b>49</b>		<b>1,449</b>	<b>109,478</b>

The overall quantity and impact of outages reduced significantly from 2017 to 2018. Notably, while the number of outages was reduced by 16%, the impact in Customer Minutes Interrupted dropped by 81%. This highlights the difference in impact of a storm heavy 2017 versus a rainy, saturated 2018. Fewer instances of multi-outage events allowed for quicker response times from crews. The implementation of connected mobile outage dispatching also allows for crews to quickly assess the scope of outages visually, rather than depending on radio communications to convey changes.

As noted on page one of this report, tree related outages continue to pose a challenge to reliability. While the impact of tree related outages was lessened, the increased quantity of off right-of-way tree outages shows that continued effort is necessary to protect the Company’s system. Sustaining the focus of staff and contractors on identifying and removing ‘hazard’ trees, as well as expanding tree clearances will position the Company to continue to improve its metrics in this area.

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.**

<b>Program</b>	<b>Goal</b>	<b>Completed</b>	<b>Comment</b>
Infrared Inspection	Substation and 1/3 of all overhead lines	95%	Specific areas deferred to 2019 due to inclement weather and capital work. Sections to be reconducted and relocated 2018 were omitted.
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	203	100%	203 locations inspected.
3Ø Padmount Transformer Oil Test	42	100%	44 transformers tested. Quantity revised to reflect actual quantity in service at time of inspection.
Line Equipment Inspection	155	100%	155 locations inspected. <ul style="list-style-type: none"> <li>• 22 Capacitors</li> <li>• 46 Reclosers</li> <li>• 12 Regulators</li> <li>• 75 Switches</li> </ul>
Pole Inspection and Treatment	726	100%	724 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: 0 “Reject” poles identified: 26	19%	5 reject poles replaced. Remaining rejects scheduled for replacement prior to 7/31/19.
Substation Equipment Inspection	12 Monthly Inspections	100%	12 inspections completed.
Recloser Maintenance	8 Reclosers	100%	Completed maintenance on 8 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.**

<b>Program</b>	<b>Budget \$</b>	<b>Actual \$</b>	<b>Comment</b>
Infrared Inspection		7,381	Not budgeted individually. 100% completed.
Vegetation Management	162,000	177,102	A significant number of priority Ash trees were identified and removed during the year. This contributed to an exception of the budgeted amount. To help mitigate ongoing contractor price pressure, the Company continued its plan to solicit bids earlier in the year for 2017.
Visual Line Inspection		374	Not budgeted individually. 100% completed.
Padmount Equipment Inspection		13,675	Not budgeted individually. 100% completed.
3Ø Padmount Transformer Oil Test		3,937	Not budgeted individually. 100% Completed.
Line Equipment Inspection		12,714	Not budgeted individually. 100% completed.
Pole Inspection and Treatment	26,790	34,266	100% completed. Overran budgeted amount by 28% due to higher than anticipated contractor costs.
Substation Equipment Inspection		868	Not budgeted individually. 100% completed.
Recloser Maintenance		8,168	Not budgeted individually. 100% completed.
<b>Total</b>		<b>258,485</b>	

**§ 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.**

<b>Project</b>	<b>Budget Amount \$</b>	<b>Actual Expenditures \$</b>	<b>Variance \$</b>	<b>Comment</b>
General Construction	822,240	907,804	85,564	Over budget due to greater than expected volume of new service requests, including line extensions. Storm damages and underground failures were also higher than expected.
Transformers	53,772	58,193	4,421	Over budget due to 2017 budgeted transformer order not arriving until 2018.
Meters	110,294	74,402	-35,892	Three-phase meter order budgeted, but order deferred to 2019 at request of vendor.
Supplee Mill Rd Relocation	74,126	68,732	-5,394	
UG Replacement – Wyndham Hills	99,315	154,245	54,930	Scope of project was expanded to add a loop for reliability and to include additional customers served off of an inaccessible pole.
Rt 15 Reconductor	83,190	80,702	-2,488	
<b>Total</b>	<b>1,242,937</b>	<b>1,344,078</b>	<b>101,141</b>	

**§ 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	203 Locations
3Ø Padmount Transformer Oil Test	44 Transformers
Line Equipment Inspection	155 Locations
Pole Inspection and Treatment	726 Poles
Danger and Reject Poles	To be determined from pole inspections
Substation Equipment Inspection	12 Monthly Inspections
Recloser Maintenance	8 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.)

<b>Program</b>	<b>Budget \$</b>	<b>Comment</b>
Infrared Inspection	N/A	Not budgeted individually
Vegetation Management	\$176,000	
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		
Danger and Reject Poles	N/A	Not budgeted individually
Substation Equipment Inspection	N/A	Not budgeted individually
Recloser Maintenance	N/A	Not budgeted individually
<b>Total</b>		

**§ 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	822,240
Transformers	53,772
Meters	110,294
Supplee Mill Rd Relocation	74,126
UG Replacement – Wyndham Hills	99,315
Rt 15 Reconductor	83,190
<b>Total</b>	<b>\$1,242,937</b>

**§ 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.