



UGI Utilities, Inc.
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VIA FEDERAL-EXPRESS

April 30, 2019

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Ms. Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

RE: **Annual Electric System Reliability Report**
3 Years Ending December 31, 2018 ("PUBLIC")
Docket Nos. L-00030161 and M-00991220

M-2016-2522508

Dear Secretary Chiavetta:

Pursuant to the Commission's May 7, 2004 Final Rulemaking Order amending Electric Service Reliability Regulations (52 Pa. Code §§57.191 - 57.197) at Docket Nos. L-00030161 and M-00991220, UGI Utilities, Inc. - Electric Division ("UGI") hereby files its Annual System Reliability Report. This report contains SAIDI, SAIFI, and CAIDI results on a 3-year rolling basis for the period ending December 31, 2018 along with the raw data from the same period.

The Office of Consumer Advocate, the Office of Small Business Advocate, the Bureau of Audits, and the Bureau of Technical Utility Services have each been served with copies of this filing.

Questions related to the attached report should be directed to Mr. Vince DeGiusto, Jr. at (570) 830-1289 or email vdegiustojr@ugi.com.

Sincerely,

Eric Sorber
Electric Division, Director – Engineering & Operations

Attachment



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cc: **FEDERAL EXPRESS**

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UGI Utilities, Inc. – Electric Division
Annual System Reliability Report
2018

April 30, 2019

**UGI Utilities, Inc. – Electric Division
2018 Electric Service Reliability Annual Report**

§ 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.

For the twelve-month period ending December 2018, UGI Utilities, Inc. – Electric Division’s (“UGI” or “Company”) SAIDI was 219 minutes. This is below the 12-month standard of 256 minutes but is above the benchmark of 140 minutes. UGI’s SAIFI for the 12-month period was 1.20, which falls above its 12-month benchmark of .83 and 12-month standard of 1.12. UGI’s CAIDI was 183 minutes for the most recent 12-month period. This falls below the 12-month standard of 228 minutes but above the 12-month benchmark of 169 minutes.

UGI’s objective is to provide its customers with safe, reliable electric service. Providing reliable service is not a program unto itself, but rather it is an inherent part of every element of the service delivery process. Each segment of service delivery, including system design, construction, and operation and maintenance, has service reliability as its main objective.

System Design

System design is fundamental to providing reliable electric service. To that end, UGI has incorporated service reliability into all aspects of its system design. Planning standards, construction standards, component selection, engineering, engineering training, engineering instructions and Supervisory Control and Data Acquisition (“SCADA”) integration programs all have service reliability as a fundamental consideration.

Construction

No matter how well an electrical system is designed, the components making it up must be properly assembled in order for it to function as intended. UGI construction personnel possess the knowledge and skills necessary to effectively perform their duties. Post construction inspection programs assure that additions and improvements to the system are completed properly.

Operation

A continuously staffed operations center is in place to assure quick response to interruptions on the delivery system. The center is staffed by system operators who diagnose system problems and mount a rapid and appropriate response to trouble on the system.

There are service/line personnel on duty eight hours a day during weekdays and on Saturdays. An afternoon shift trouble-man is scheduled during weekdays to provide quick response to service interruption calls. Call-out rosters are in place to mobilize staff when service/line personnel are not on duty or when additional resources are required.

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UGI has an outage management system in place, which allows it to gather information on system interruptions. The information accumulated in this system is analyzed to spot equipment failure trends and outage clusters. This information is also used to spot weaknesses in the system and to make decisions on allocation of resources for maintenance and/or system upgrades.

UGI is currently undergoing a Distribution SCADA project to integrate distribution automation devices and select substation devices under one (1) system. This project will acquire and historize distribution data not currently available and allow the control of distribution devices from the operations center.

Maintenance

UGI has inspection and maintenance programs in place to monitor all equipment on its system and to address any problems identified through these programs. UGI implemented the 2017 – 2018 Bi-annual I&M Plan filed with the Commission and has found no significant system equipment issues during performance of the I&M Plan initiatives in 2018. UGI has identified an increase in the number of potential danger trees via the annual vegetation inspections performed under the Bi-annual I&M Plan. The increase is primarily due to the infestation of the Emerald Ash Borer, which is devastating the Pennsylvania ash tree population. UGI has added additional vegetation resources to target additional danger tree removals going forward.

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2018 Electric Service Reliability Annual Report**

§ 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.

- (i) Under Title 52, Pa. Code §57.192, a major event is defined as either:
 - a) An interruption of electric service resulting from conditions beyond the control of the electric distribution company which affects at least 10% of the customers in the EDC’s service territory during the course of the event for a duration of 5 minutes each or greater. The event begins when notification of the first interruption is received and ends when service to all customers affected by the event is restored.
 - b) An unscheduled interruption of electric service resulting from an action taken by an electric distribution company to maintain the adequacy and security of the electrical system, including emergency load control, emergency switching and energy conservation procedures, as described in §57.52 (relating to emergency load control and energy conservation by electric utilities), which affects at least one customer.
- (ii) A major event does not include scheduled outages in the normal course of business or an electric distribution company’s actions to interrupt customers served under interruptible rate tariffs.

Major Events

There were two (2) major events during 2018.

Event 1

The event occurred on July 12, 2018 at 06:51 until July 12, 2018 at 08:55 (124 minutes). The event involved the outage of Courtdale substation which affected 8,031 customers (12.7%) out of a 62,999-customer base. The event detail is as follows:

The Courtdale substation is tapped off the Mountain-Kingston #1 66kV transmission line which also serves the Kingston substation #2 transformer. A squirrel contacted the line and a portion of the bus structure on the high side of the #2 transformer at Kingston substation. This correctly caused a transformer differential relay operation, which subsequently and correctly tripped/opened the Mountain - Kingston #1 66kV line causing the outage to the Courtdale Substation. Once the fault cleared the expected isolation of the transformer/fault and subsequent reclosing of the transmission line, which would normally restore the Courtdale substation, did not occur. This was due to the failure of the high-side 66kV motor operated air-break (MOAB) for the #2 transformer, to open. This resulted in the outage of Courtdale substation until the situation was investigated and the line was restored.

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UGI Utilities has taken the following steps to minimize this event from reoccurring:

- UGI is procuring and will install animal guards to minimize animal contacts to the extent possible at the Kingston substation.
- UGI identified and replaced the failed component in the control circuit which would initiate the opening of the MOAB and isolate the line from the transformer and restore Courtdale Substation to full service within 2.5 seconds of a transformer differential operation.
- UGI is procuring and will install SCADA controlled 66kV transmission switches at the Courtdale substation to reduce transmission switching times in the event the normal source to Courtdale substation is unavailable.

Event 2

The event occurred on July 25, 2018 at 18:07 and lasted until July 26, 2018 at 01:18. The event initially involved the operation of the Hunlock – Berwick 66kV transmission line but evolved into the outage of the Hunlock substation 66kV bus. Ultimately the resulting bus outage impacted the Hunlock and Koonsville distribution substations, with a total customer outage of 9,761 customer (15.5%) of the 62,771 UGI customer base. A detailed description of the event is as follows:

During a heavy rain event, which resulted in flash flooding in the vicinity of the Hunlock and Koonsville substations, an off-right-of-way tree came in contact with the Hunlock-Koonsville section of the Hunlock-Berwick 66kV line. The fault caused the 66kV circuit breaker (CB) 42 at Hunlock to lock out. PPL Utilities Hunlock CB at Berwick was out of service (being replaced) so that source was unavailable. Following normal procedures, the UGI System Operator sectionalized the line (location of fault was not known at the time), opening a 66kV switch at Koonsville Substation and tested the line again closing CB 42. The manual reclose of CB 42 incorrectly caused the Hunlock 66kV bus to lock out (as opposed to an expected trip of CB 42 due to the permanent fault on the transmission line) due to the operation of the failed/stuck breaker relay on CB 42. This resulted in the outage the Hunlock substation in addition to the Koonsville substation. After crews investigated the situation at Hunlock substation, CB 42 was opened and the Hunlock 66kV bus was energized allowing the Hunlock transformer and corresponding customers to be restored. The remaining customers off the Koonsville substation were restored via distribution switching.

UGI Utilities has taken the following steps to minimize this event from reoccurring:

- UGI investigated the operation of the failed/stuck breaker relay on CB 42. The relay and CB 42 were both tested. It was determined that both the relay, and the breaker were operating correctly and that the coordination with the other protection schemes was correct.
- UGI has purchased and will be installing 66kV directional fault detectors at the sectionalizing point on the Hunlock-Berwick 66kV line. These devices will allow field crews to quickly identify which section of the line the fault occurred and prevent reclosing into a fault.

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Modified Procedures

UGI continues its program to install additional distribution sectionalizing devices. This includes automatic and manual type devices such as reclosers, air-breaks, switches and fuses. These facilities will increase reliability by reducing the number of customers exposed to an outage or by providing sectionalizing points which will isolate customers from damage and allow partial restoration of circuit sections. UGI field personnel completed the evaluation of every feeder on UGI's distribution system and added twelve (12) fuse installations in 2018. Future fuse installations will be identified using feeder reliability as the main driver. In addition, UGI upgraded nineteen (19) reclosers in 2018 providing remote monitoring and control. UGI expects to add or upgrade fourteen (14) additional reclosers, add twenty (20) fuse installations and replace two (2) fuse installations with air-breaks in 2019.

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§ 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.

The reliability results for UGI’s service area over the last three years are as follows:

2016 – 2018 Reliability Statistics

	SAIDI	SAIFI	CAIDI
3-Year Avg. Standard	170	0.91	186
UGI 3-Yr. Rolling Avg.	121	0.77	156

	SAIDI	SAIFI	CAIDI
12-Month Standard	256	1.12	228
12-Month Benchmark	140	0.83	169
2018 UGI Results	219	1.20	183
2017 UGI Results	64	0.49	131
2016 UGI Results	78	0.63	125

The 3-year rolling averages for SAIFI, SAIDI and CAIDI are performing within the standards established by Commission Order at Docket No. M-00991220 on May 7, 2004.

Data necessary to calculate a Momentary Average Interruption Frequency Index (MAIFI) is not available for UGI’s service area. As previously discussed with the Commission, UGI currently has no plan to install the equipment required to track momentary interruptions on the hundreds of operating distribution devices located throughout its territory. The basis for this decision is the high cost associated with the purchase and installation of these devices with little commensurate benefit.

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	Raw Data				Reported Indices		
	SI	TCI	TCB	TMCI	SAIDI	SAIFI	CAIDI
January-2018	35	3,397	63,491	676,409	11	0.05	199
February-2018	12	116	63,352	16,175	0	0.00	139
March-2018	91	3,991	63,311	2,916,858	46	0.06	731
April-2018	52	4,494	63,226	1,050,570	17	0.07	234
May-2018	90	10,269	63,098	2,430,214	39	0.16	237
June-2018	47	7,643	63,023	560,989	9	0.12	73
July-2018	79	26,392	62,999	2,726,606	43	0.42	103
August-2018	32	6,696	62,864	754,177	12	0.11	113
September-2018	39	7,043	62,771	2,103,322	34	0.11	299
October-2018	36	1,017	62,587	158,744	3	0.02	156
November-2018	28	3,083	62,585	221,274	4	0.05	72
December-2018	22	1,264	62,520	174,493	3	0.02	138
<i>2018 Total</i>	563	75,405	62,986	13,789,831	219	1.20	183
January-2017	24	1,171	63,729	137,902	2	0.02	118
February-2017	21	685	63,748	156,560	2	0.01	229
March-2017	41	3,588	63,792	461,297	7	0.06	129
April-2017	23	3,708	63,773	352,494	6	0.06	95
May-2017	40	2,975	63,719	560,540	9	0.05	188
June-2017	38	4,273	63,734	543,442	9	0.07	127
July-2017	41	2,153	63,673	351,089	6	0.03	163
August-2017	32	2,643	63,687	556,026	9	0.04	210
September-2017	13	3,861	63,708	269,491	4	0.06	70
October-2017	36	4,568	63,634	312,749	5	0.07	68
November-2017	25	1,186	63,549	323,967	5	0.02	273
December-2017	17	584	63,528	80,312	1	0.01	138
<i>2017 Total</i>	351	31,395	63,690	4,105,869	64	0.49	131
January-2016	27	639	59,889	90,830	2	0.01	142
February-2016	40	9,830	59,889	1,258,214	21	0.16	128
March-2016	26	6,973	59,783	831,584	14	0.12	119
April-2016	46	1,672	59,519	449,736	8	0.03	269
May-2016	27	3,631	59,375	713,329	12	0.06	196
June-2016	38	1,060	60,944	127,727	2	0.02	120
July-2016	48	10,274	63,668	753,493	12	0.16	73
August-2016	49	1,140	63,653	150,282	2	0.02	132
September-2016	26	1,782	63,584	249,920	4	0.03	140
October-2016	33	578	63,644	120,393	2	0.01	208
November-2016	10	553	63,662	22,521	0	0.01	41
December-2016	12	777	63,666	78,310	1	0.01	101
<i>2016 Total</i>	382	38,909	61,773	4,846,339	78	0.63	125
3-YEAR AVERAGE	432	48,570	62,816 *	7,580,680	121	0.77	156

* annual arithmetic average

SI: System Interruptions
TCB: Total Customer Base

TCI: Total Customers Interrupted
TMCI: Total Minutes Customer Interrupted

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§ 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 by Cause - January 2018 through December 2018

OUTAGE CAUSE	% OF TOTAL INCIDENTS	NUMBER OF INTERRUPTIONS	CUSTOMERS INTERRUPTED	MINUTES INTERRUPTED
Animal	10.66%	60	536	49,473
Company Agent	0.53%	3	339	2,475
Construction Error	0.00%	0	0	0
Customer Problem	0.36%	2	688	68,712
Dig In	0.18%	1	3	420
Equipment Failure	22.38%	126	21,189	1,841,366
Lightning	4.09%	23	852	102,495
Motor Vehicle	5.33%	30	8,486	1,608,124
Other	1.07%	6	1,178	20,406
Public	0.71%	4	4,321	177,529
Structure Fire	0.00%	0	0	0
Trees	37.30%	210	20,830	6,279,798
Unknown	2.84%	16	2,042	314,706
Weather Related	4.09%	23	10,961	1,795,637
Weather/Snow	0.18%	1	75	27,750
Weather/Ice	0.18%	1	18	1,962
Weather/Wind	10.12%	57	3,887	1,498,978
TOTAL	100.00%	563	75,405	13,789,831

Proposed Solutions to Identified Problems:

UGI has not identified any particular source of outage as problematic. As a small system, UGI is subject to a high level of variability in system damage due to weather. As the reliability data indicates, 2018 has been a challenging year from a reliability perspective for our customers, especially those served in some of the more remote and isolated areas of our system which have been impacted by multiple and extended outages. UGI attributes the bulk of reliability impacts to weather, considering the record wet weather in 2018 as well as several significant stand-alone events caused by storms and equipment failures which impacted our facilities. In reviewing these events globally, we consider 2018 to be an anomaly as opposed to an indicator marking a trend towards a long-term decline in reliability. However, consideration of more frequent and intense weather events, coupled with external factors such as invasive species like the Emerald Ash Borer, must be considered in our reliability and infrastructure planning to ensure we are prepared for a changing environment and emergent reliability challenges. UGI has

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already undertaken an accelerated focus on infrastructure replacement and implemented several infrastructure and technology-based reliability programs including accelerated underground cable and wood pole replacement, Distribution Automation (DA), enhanced feeder sectionalizing and primary substation tie-line additions. These programs have been developed to address significant long-term reliability factors. Considering these programs and the additional programs documented in the UGI Long Term Infrastructure Improvement Plan (LTIIIP), UGI fully expects to improve overall system reliability and, to some extent, smooth out historical weather-related variability.

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

There have not been any significant changes during 2018 to the transmission and distribution inspection and maintenance programs outlined in previous reports submitted to the Commission. Starting January 1, 2011 all of the Electric Division's distribution system equipment is being inspected and maintained consistent with its Bi-Annual Inspection and Maintenance Plan as filed with the Commission. The Plan's requirements do not significantly alter UGI's prior inspection and maintenance programs.

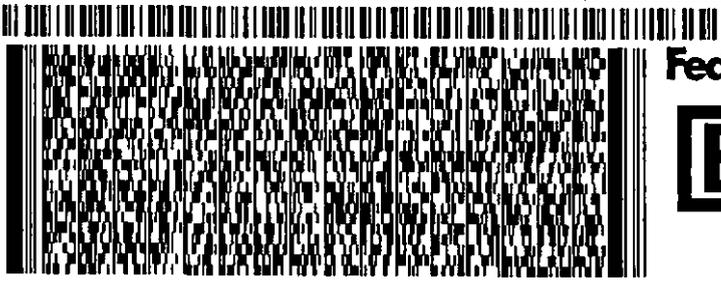
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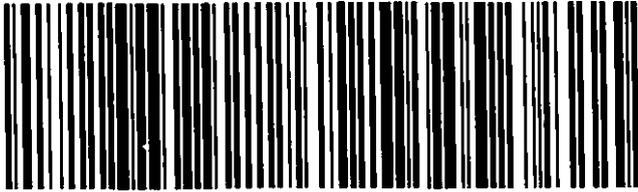


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