Madison Gas and Electric Company
Docket 5-GF-113

2022 Annual Reliability Report (PSC 113.0604)

PSC 113.0604 (2)(a) – Overall MGE System Reliability

Madison Gas and Electric Company (MGE) operates an electric distribution system in a single area within Dane County. The chart below shows the System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI), and Customer Average Interruption Duration Index (CAIDI) statistics for 2021 and 2022. MGE had one major event day (MED) in 2021 and four MED in 2022.

Year	Customers	Customers Out	Customer Minutes	SAIFI	SAIDI (minutes)	CAIDI (minutes)
2021	159,618	45,306	6,325,991	0.284	39.63	139.63
2022	160,997	62,834	17,753,035	0.390	110.27	282.54

Excluding Transmission Outages

The chart below shows MGE's SAIFI, SAIDI, and CAIDI statistics for 2021 and 2022 excluding outages caused by American Transmission Company's system events (one in 2021 and zero in 2022).

Year	Customers	Customers Out	Customer Minutes	SAIFI	SAIDI (minutes)	CAIDI (minutes)
2021	159,618	42,777	6,308,415	0.268	39.52	147.47
2022	160,997	62,834	17,753,035	0.390	110.27	282.54

PSC 113.0604 (2)(b)(c) – Worst-Performing Circuits

MGE's list of worst-performing circuits (2)(c) is based on two reliability indices: SAIFI and Momentary Event Annual Interruption Frequency Index ($MAIFI_E$), also described as a momentary event for the purposes of this report. MGE has identified a total of 14 worst-performing circuits for 2022, ten based on SAIFI and four based on $MAIFI_E$. These are selected based upon the following criteria:

- When selecting circuits based on SAIFI, MGE starts with the highest SAIFI total and moves down the list to select additional circuits until a significant performance gap occurs near ten circuits.
- When selecting circuits based on $MAIFI_E$, MGE starts with the highest $MAIFI_E$ total and moves down the list selecting additional circuits until a significant performance gap occurs between three to five circuits.

The MGE Distribution Reliability Working Group (DRWG) regularly reviews and investigates outages using root cause analysis (RCA) methods. To address the Worst Performing Circuits, the DRWG employs cost/benefit analysis and project prioritization methods to identify cost-effective corrective actions.

Worst-Performing Circuits - SAIFI

Circuit	SAIFI	Major Root Cause(s)	Action(s) Taken	Action Dates	Ongoing Action(s)
TKY 1330	2.29	Trees, Cut-out Failure	RCA completed; Repairs completed during incident.	N/A	Installing Distribution Automation in 2023, TKY Substation Expansion
FPT 433	2.13	Trees	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None
WLT 1315	2.13	Trees	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None
MON 444	2.05	Trees	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None
GRE 451	2.02	Trees	RCA completed; Repairs completed during incident.	N/A	2024 4kV conversion engineering ongoing, Large Customer Resiliency Work
TKY 1328	1.92	Cable Failure	RCA completed; Repairs completed during incident.	N/A	TKY Substation Expansion
WLT 1316	1.65	Trees	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None
RKN 1337	1.51	Trees, Cut-out Failure	RCA completed; Repairs completed during incident.	N/A	Phase 1 of targeted UG with Q3/Q4 construction target
FCH 1317	1.44	Trees, Wildlife	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None
SPR 1321	1.43	Substation, Trees, Wildlife	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None

Worst-Performing Circuits - $MAIFI_E$

Circuit	$MAIFI_E$*	Major Root Cause	Action(s) Taken	Action Dates	Ongoing Action(s)
LKV 451	7.86	Transformer Failure, Storm	RCA completed; Repairs completed during incident; no further action recommended.	N/A	2025 4kV conversion engineering ongoing
RKN 1337	7.69	Trees, Wildlife	RCA completed; Repairs completed during incident; no further action recommended.	N/A	Phase 1 of targeted UG with Q3/Q4 construction target
FEM 1306	7.64	Construction, Trees, Vehicle, Wildlife	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None
MON 444	7.63	Construction, Trees	RCA completed; Repairs completed during incident; no further action recommended.	N/A	None

**$MAIFI_E$ refers to service interruptions lasting for less than five minutes. This may include more than one recloser cycle. Infield recloser operations that affect only a portion of the customers on a circuit account for any decimals.*

PSC 113.0604 (2)(d) – Status of Response Plans Filed in the Prior Report

All improvements and evaluations proposed in last year's report have been completed.

PSC 113.0604 (2)(e) – New or Modified Power Quality or Reliability Programs

In 2022, MGE continued with its implementation of Distribution Automation throughout our distribution system. This included identifying areas where automation would improve reliability to customers and installing the necessary equipment for operation.

PSC 113.0604 (2)(f) – Long-Range Electric Distribution Plan

MGE performs long-range electric distribution system planning to assure that the capacity and voltage of the system will be adequate for normal and contingency conditions. The plans are based on forecasts of future population growth, facility loads, voltages, and expected customer use. The capacity, contingency, and reliability planning efforts identify projects for the MGE ten-year electric distribution plan. These plans are updated annually. In addition, distribution improvements are planned to increase reliability in specific areas and to replace facilities that are at the end of their practical service life.

The MGE Preventive Maintenance Plan ensures that regular inspection, maintenance, and replacement is accomplished for poles, overhead switches, pad-mount switchgear, elbow cabinets, pad-mount transformers, reclosers, regulators, capacitor banks, and substation equipment to maintain or improve reliability.

PSC 113.0604 (3)(a) – Miles of Distribution Line Rebuilt

The totals below include conversion from overhead to underground, 4- to-14-kV voltage conversions, cable replacements, or overhead relocations. Two-phase distribution rebuilt is shown as two single-phase lines (this is not common).

Miles of Distribution Line Rebuilt for 2022			
Overhead		**Underground**	
Single Phase	**Three Phase**	**Single Phase**	**Three Phase**
.7	1.0	4.5	4.4

PSC 113.0604 (3)(b) – Miles of Line in Service by Voltage Level

	OH Miles	**UG Miles**	**Total**
4.16 kV	153.6	52.7	206.3
12.47 kV	39.0	86.4	125.3
13.8 kV	648.4	1177.1	1825.5
Totals	**840.9**	**1316.2**	**2157.1**

PSC 113.0604 (3)(c) – Monthly Average Speed of Answer in Seconds

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gas Leak	11	8	12	12	11	12	19	15	15	17	11	11
Emergency/Outage	11	4	6	12	7	21	18	17	20	21	10	26
Billing	18	13	13	38	28	48	61	58	62	63	47	17

PSC 113.0604 (3)(d) – Service Installation Timeliness

MGE employs proactive communication with the customer to identify a mutually agreed-upon date the service is needed. The table below provides the average number of calendar days for the average service install from the date the site is deemed ready.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days to Average Install	20	48	36	22	35	41	44	38	37	31	38	34

PSC 113.0604 (3)(e) – Total Complaints

The following table shows the total complaints (written and telephone) by category and month for 2022.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Credit Cards Comments	0	1	0	0	0	0	1	0	0	0	0	0	2
Disconnection of Service	0	0	0	0	0	0	0	1	4	8	0	0	13
High Bill Investigations/Complaints	118	283	122	38	13	12	37	30	28	14	10	51	756
Phone System Comments	0	0	1	0	1	0	0	0	0	0	0	1	3
Late Payment Charges - Gas and Electric	0	0	1	0	0	1	3	2	2	0	3	1	13
Miscellaneous	14	26	17	9	4	9	3	22	9	14	13	11	151
Outage	0	0	0	0	1	5	1	0	0	0	2	2	11
PSCW Complaints	1	2	0	1	0	1	0	0	4	4	6	4	23
Payment Arrangements	0	0	0	0	2	0	1	1	2	0	0	0	6
Property Damage	0	1	0	0	1	0	0	0	0	0	0	0	2
Quality/Timeliness of Job or Service	5	3	2	3	13	5	3	4	2	4	1	2	47
Rates/Electric Surcharge	18	12	4	2	3	2	0	0	3	1	0	3	48
Safety	0	0	0	0	1	0	1	0	0	0	0	0	2
	156	328	147	53	39	35	50	60	54	45	35	75	1077

PSC 113.0604 (3)(f) – Total Tree Trimming Budget and Actual Expenses

Category	Description	2022 Budget	2022 Actual
10930-2361	Routine Maintenance	1,920,000	1,872,699
10930-2362	Unplanned - Reactionary	185,000	273,752
10930-2365	Unplanned -Ash Mitigation	396,000	312,057
	Total	**2,501,000**	**2,458,508**
Capital Projects	Construction Projects		296,658

PSC 113.0604 (3)(g) – Total Annual Projected and Actual Circuit Miles of Distribution Line Trees Trimmed

Circuit Miles of Line Clearance Planned in 2022: 153.4 miles
Circuit Miles of Line Clearance Completed in 2022: 162.2 miles

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