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Count on Us

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March 29, 2013

Ms. Mary Jo Kunkle
Executive Secretary
Michigan Public Service Commission
4300 West Saginaw
Lansing, MI 48917

RE: **Case No. U-16066; In the matter, on the Commission's own motion, to require Consumers Energy Company to provide electric power reliability information in its annual power quality report.**

Dear Ms. Kunkle:

Enclosed for electronic filing in the above captioned case is "**Consumers Energy Company's Annual Power Quality Report."**

This is a paperless filing and is therefore being filed only in a PDF format.

Sincerely,

Digitally signed by
Raymond E. McQuillan
Date: 2013.03.29
08:20:36 -04'00'

Raymond E. McQuillan

cc: Brian Ballinger
Pete Derkos
Charyl Kirkland
Don Mazuchowski
Jordan Reasoner

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter, on the Commission's own motion, to require **CONSUMERS ENERGY COMPANY** to provide electric power reliability information in its annual power quality report.	)))))	Case No. U-16066

CONSUMERS ENERGY COMPANY'S ANNUAL POWER QUALITY REPORT:
I. SAIFI, CAIDI, SAIDI
II. PRIMARY CUSTOMER POWER QUALITY INVESTIGATIONS

Background

On September 15, 2009, the Michigan Public Service Commission ("MPSC" or the "Commission") issued an Opinion and Order in Case No. U-16066, in which it directed that the two major Michigan utilities: 1) provide information related to System Average Interruption Frequency Index ("SAIFI"),[1] Customer Average Interruption Duration Index ("CAIDI"),[2] and System Average Interruption Duration Index ("SAIDI")[3] reliability indices with and without major events, on a rolling five-year average basis, using the industry standard Institute of Electrical and Electronics Engineers ("IEEE") method of calculation, and 2) file an annual power quality report which contains data on all primary customer power quality investigations conducted in the past year for end-use customers, derived from their power quality meters, and the outcome of each investigation. This Report contains Consumers Energy Company's ("Consumers Energy" or the "Company") January 1, 2012 through December 31, 2012, results and compliance status per those requirements.

[1] SAIFI represents the average number of interruptions per customer per year.
[2] CAIDI represents the average restoration time per outage.
[3] SAIDI represents the average number of minutes of interruptions per customer.

I) Reliability Indices

Consumers Energy's rolling five-year average SAIDI, SAIFI, and CAIDI indices are summarized in the following table. These indices were calculated using the Major Event Day ("MED") methodology contained in IEEE Standard 1366-2003. Graphical representations of this data can be found on pages 4 through 6.

Year	All Conditions						Excluding Major Event Days per IEEE 1366-2003					
	SAIDI		SAIFI		CAIDI		SAIDI		SAIFI		CAIDI	
	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.
2003	564	318	1.70	1.38	332	223	177	176	1.07	1.11	166	158
2004	363	339	1.37	1.39	264	236	197	186	1.11	1.13	178	164
2005	395	384	1.58	1.49	250	254	237	203	1.24	1.17	192	173
2006	647	464	1.72	1.56	375	293	269	215	1.26	1.16	213	184
2007	513	496	1.57	1.59	326	310	262	228	1.28	1.19	205	191
2008	710	525	1.50	1.55	473	338	281	249	1.08	1.19	260	210
2009	346	522	1.23	1.52	283	341	222	254	1.05	1.18	212	216
2010	463	536	1.40	1.48	331	358	216	250	1.04	1.14	207	220
2011	668	540	1.64	1.47	407	364	305	257	1.36	1.16	224	222
2012	508	539	1.38	1.43	369	372	204	245	1.06	1.12	192	219

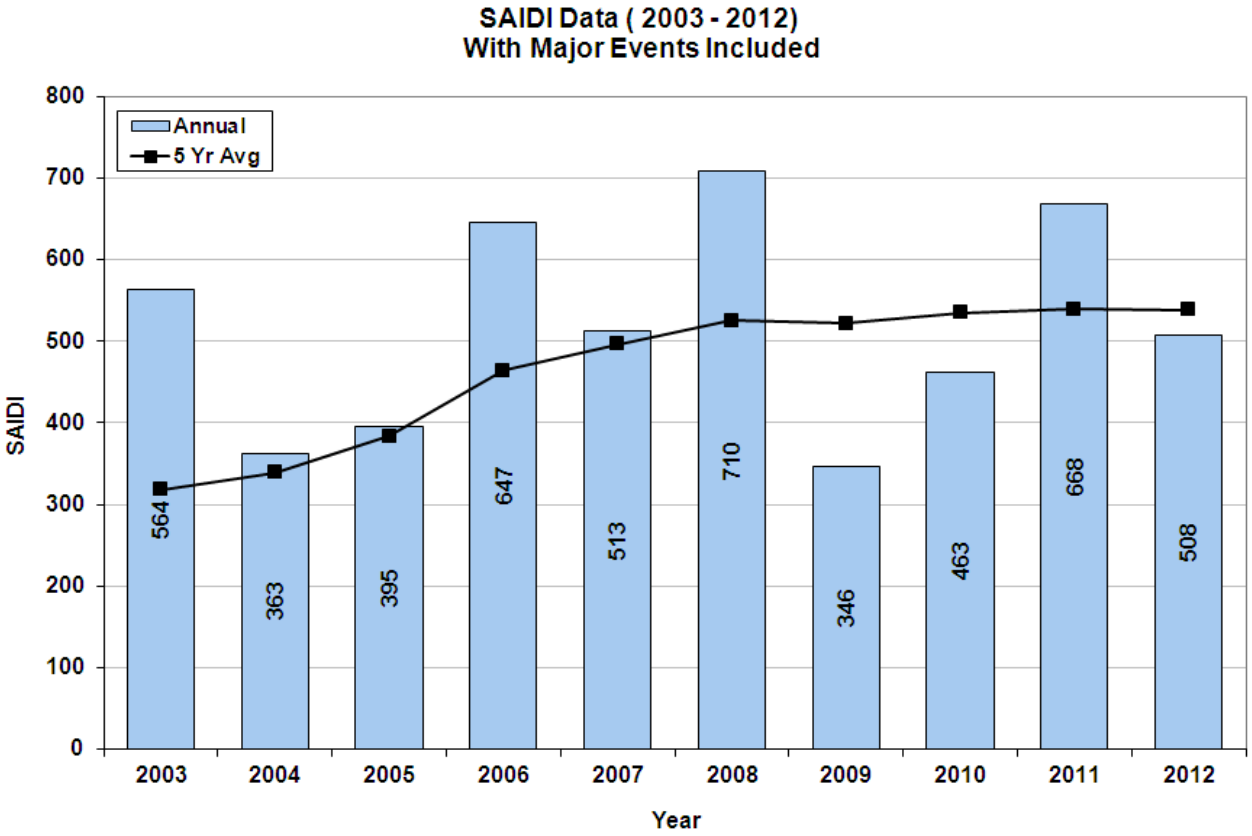
In 2011, Consumers Energy implemented several tactics designed to improve its response to customer outages. Restoration pre-planning prior to expected weather events and regular weekend pre-planning were instituted to proactively establish response approaches based on anticipated weather impacts. The Company frequently considered and scheduled weekend work assignments to perform necessary work and to have line crews available for outage response during these non-standard work hours. Office and line crew resources were mobilized in some cases prior to weather events in areas expected to be impacted. The wire down process was enhanced by creating a new role of Wire Evaluator to increase flexibility of response

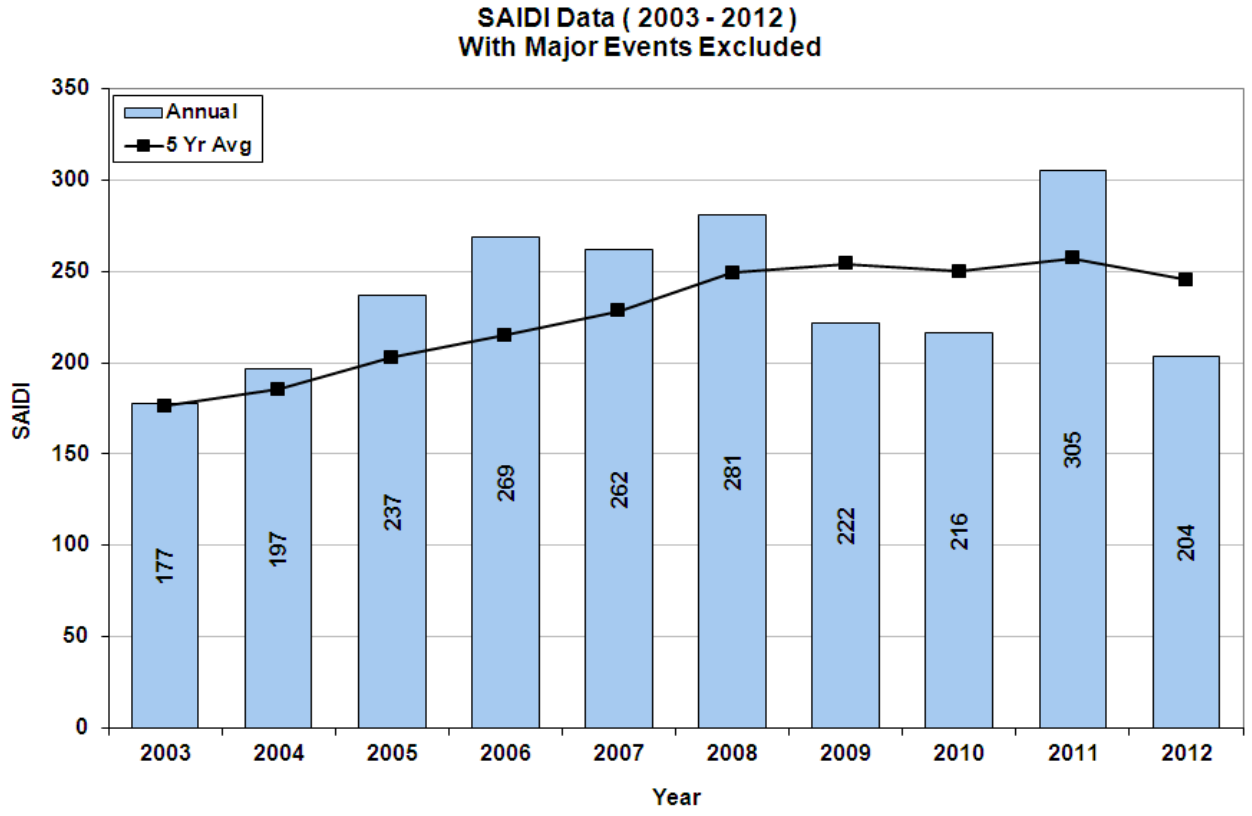
resources during storms. Mobilization of additional contractor line crews (in-state and out-of-state) was initiated earlier during, or prior to, weather events to increase resource availability in the initial phase of restoration. These tactics were utilized in 2012 as well along with additional tactics directed at enhancing local headquarters office staffing for better analysis and management of outage incidents, expanding the resource pool for managing the wire down process and populating Wire Guard/Wire Evaluator roles to allow qualified line workers to focus on restoration, auditing restoration process activities, and increasing the focus on restoration process diagnostic metrics. The combined tactics contributed to the Company achieving its best annual duration (CAIDI excluding MEDs) performance in seven years, equaling its performance of 192 minutes in 2005. Additionally, the Company improved its frequency performance (SAIFI excluding MEDs) from that same year by 15% bringing it back in line with its performance in years 2008 through 2010.

Reliability Indices Summary

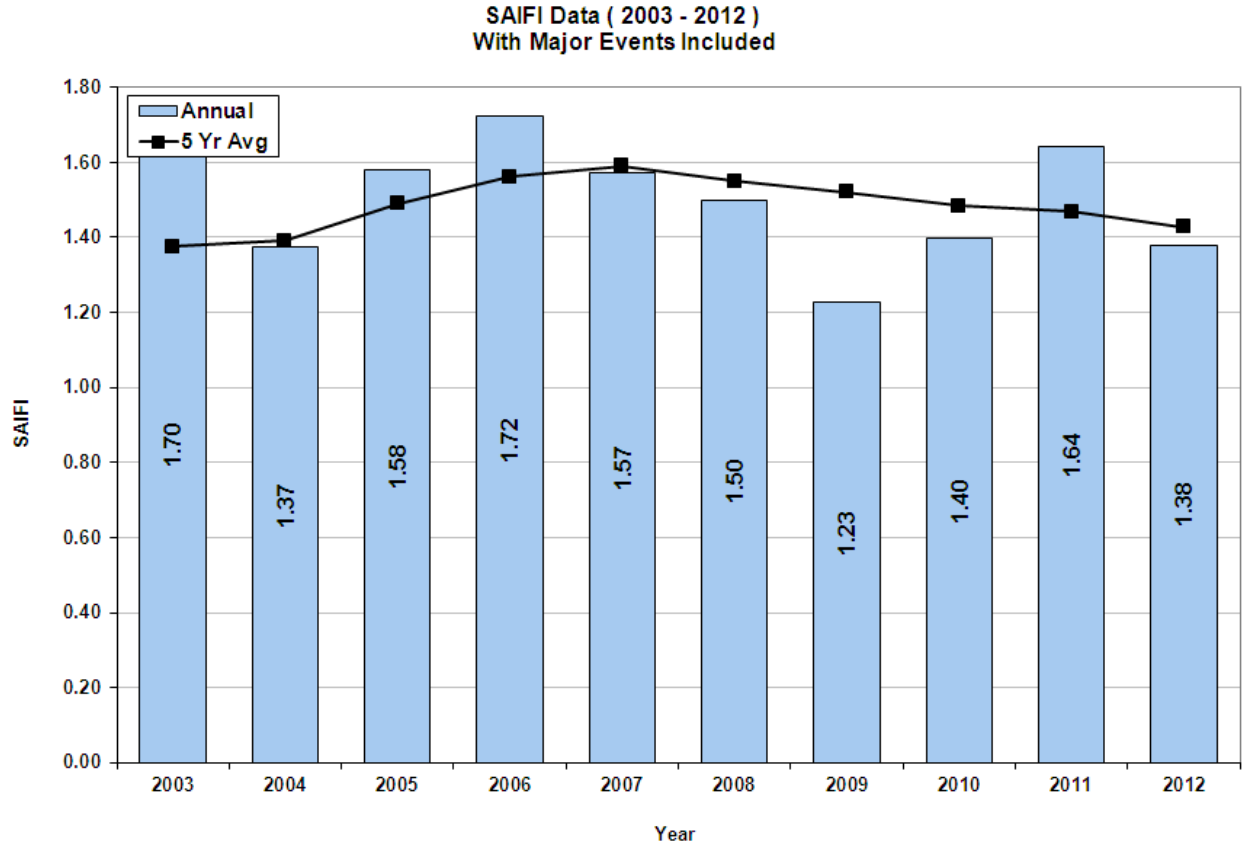
The Company's longer term goal is to achieve an IEEE Benchmarking second quartile reliability performance by year 2017 in order to improve customer service and customer satisfaction as well as advance the Company's reliability performance relative to its utility peers. To achieve this challenging goal, the Company will continue to hone its service restoration processes, improve its analytic tools and expand its methods of communication to its customers. These areas of focus combined with its reliability investments, system-hardening practices, maintenance programs, and an advanced utilization of electric system automation should produce improvement of these important reliability metrics to the benefit of its customers.

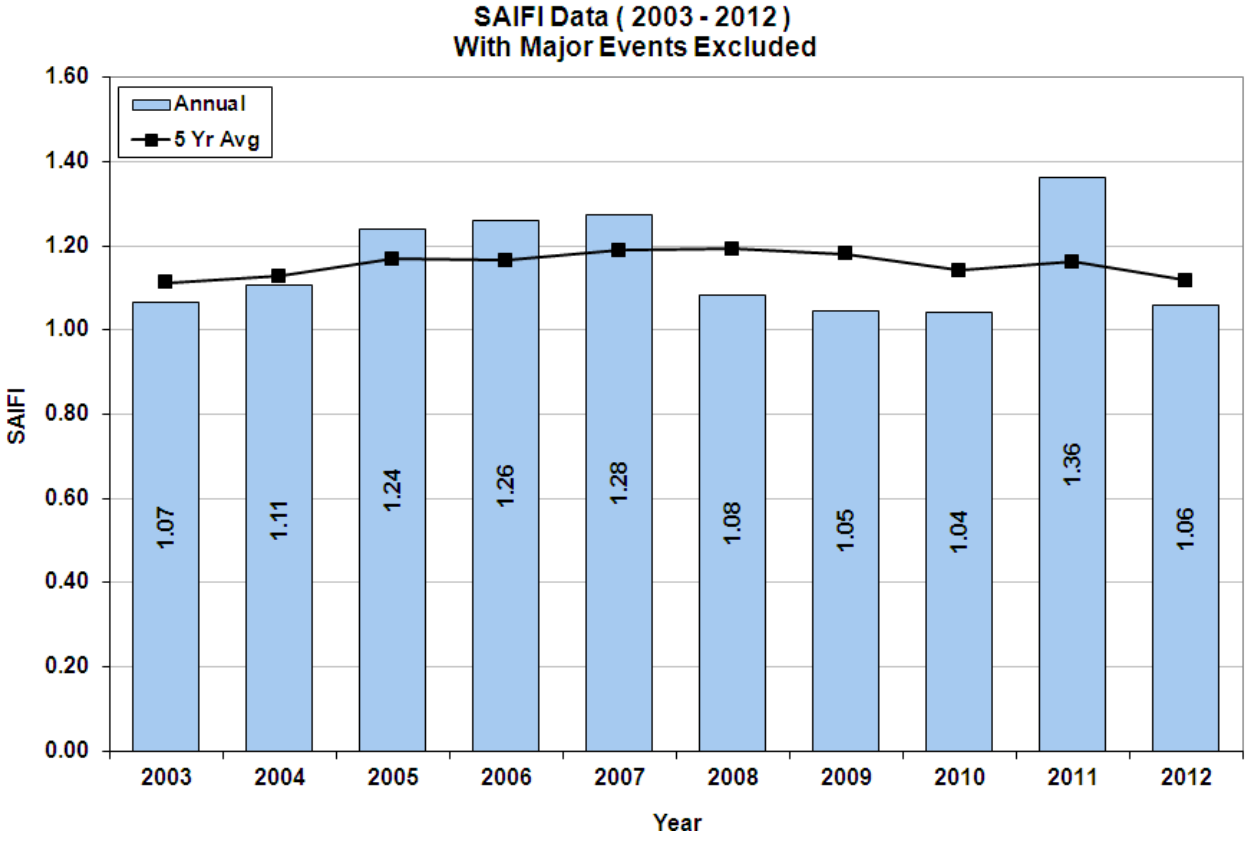
The annual and rolling five-year average values for SAIDI including and excluding major events are shown in the following graphs.



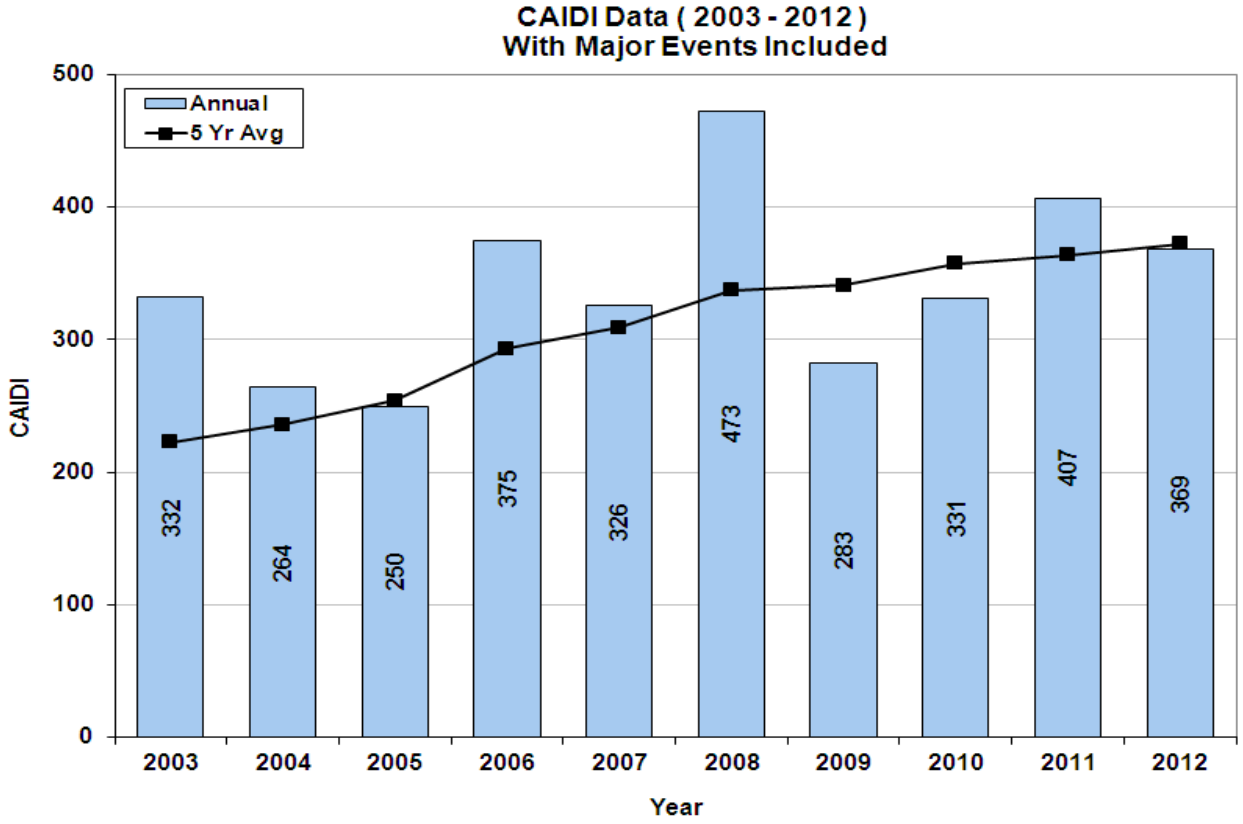


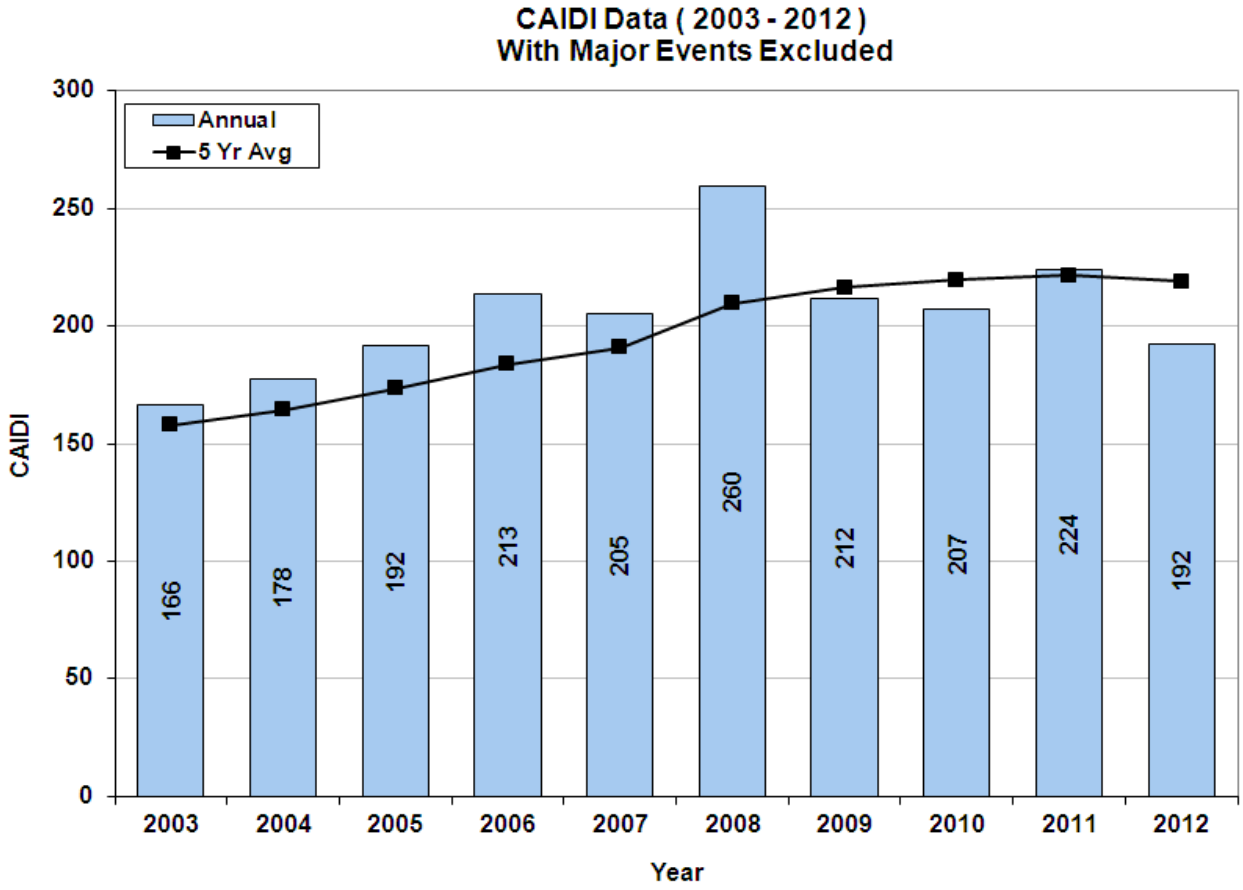
The annual and rolling five-year average values for SAIFI including and excluding major events are shown in the following graph.





The annual and rolling five-year average values for CAIDI including and excluding major events are shown in the following graphs.





II) Power Quality Report

Power Quality Process

Consumers Energy continually monitors power quality at 224 industrial and commercial locations that have primary metering. These monitors are primarily installed at dedicated substations that have a load greater than 1 MVA; however, monitors are also installed on a few customers on the distribution system in response to power quality concerns. Power Quality Monitoring uses a comprehensive process to monitor the electric system and provide customers with potential solutions to meet their needs.

The power quality data is downloaded periodically from the monitors. This data is imported and stored in an analysis database which is used to generate reports daily and on demand. Power quality information including voltage, current, power trends, harmonics, voltage and current unbalance, and detailed disturbance data, is made available to customers upon request through Consumers Energy Corporate Account Managers. On many occasions, the daily monitoring by Consumers Energy engineers has helped identify issues on the electric system.

2012 Power Quality Data

Power quality issues are not widespread within Consumers Energy's electric system; however, customer inquiries are generated as a result of experienced or perceived voltage sags, overvoltage, voltage transients, voltage flicker, high frequency noise, voltage unbalance, momentary outages, or equipment problems. In 2012 there were 54 power quality events which generated customer inquiries. Of these, 16 (approximately 30%) of the 54 events were attributable to the customer's electric system. The remaining 38 (approximately 70%) events were electrical faults or equipment malfunctions occurring on the electric system. The causes of these faults included lightning, windstorms, tree or animal contact, and other third-party activities on the utility system owned by Consumers Energy or its transmission provider. For 24 of the 38 events attributed to the utility system, Consumers Energy or its

transmission provider made repairs to the system or scheduled projects to address system performance. The remaining 14 events (of 38) were faults that were restored automatically by the electric system or that required no repairs or modifications of the electric system.

The table below indicates the power quality issues brought to the attention of Consumers Energy's Power Quality Monitoring group in 2012 where power quality monitors ("PQMs") were installed.

Inquiries			Power Quality Event [4]							Source of PQ Event			Outcomes		
Event	Date	Locations Impacted [5]	Transient	Voltage Sag	Voltage Swell	Interruption	Overvoltage	Undervoltage	Other (inc. Harmonics)	Consumers Energy [6]	Transmission Provider [7]	Customer [8]	Customer Contact [9]	Modifications [10]	Description
01	01/29	1							x			x	x		Customer reported an equipment trip, but no events were recorded by the PQM.
02	01/31	1			x					x			x	x	Customer reported equipment trips, PQM verified occasional voltage swells; A 46 kV line rebuild for capacity also improved the voltage stablility to the area.
03	02/02	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM.
04	02/20	1		x						x			x		46 kV line fault due to vehicle accident; Cleared fault and restored system.
05	02/28	1						x		x			x	x	Reported dim lights, PQM verified low voltage; Replaced voltage regulator control.
06	02/29	1		x						x			x		Distribution line tripped due to tree contact; Cleared fault and restored system.
07	03/13	1		x						x			x	x	46 kV line fault due to failed insulator; Replaced failed insulator.
08	03/15	1		x							x		x		345 kV line fault, cause unknown; Cleared fault and restored system.
09	03/25	3		x		x						x	x		Customer bushing failure.
10	03/27	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM.

[4] Heading definitions per IEEE Standard 1159-2009 Table 2 – Categories and Typical Characteristics of Power System Phenomena.
[5] Number of customer locations impacted per event.
[6] Equipment owned by Consumers Energy (138 kV, 46 kV, <25 kV).
[7] Equipment owned by transmission provider (345 kV or 138 kV).
[8] Source of the event was within the customer's electrical system.
[9] Consumers Energy provided a response to the customer including the cause of the event and any modifications planned or completed.
[10] Consumers Energy made a like for like repair to return the system to normal or scheduled a project to address system performance.

Inquiries			Power Quality Event [4]							Source of PQ Event			Outcomes		
Event	Date	Locations Impacted [5]	Transient	Voltage Sag	Voltage Swell	Interruption	Overvoltage	Undervoltage	Other (inc. Harmonics)	Consumers Energy [6]	Transmission Provider [7]	Customer [8]	Customer Contact [9]	Modifications [10]	Description
11	03/30	1		x						x			x		46 kV line fault due to lightning; Cleared fault and restored system.
12	04/03	1		x							x		x	x	Substation fault due to failed 138 kV potential transformer; METC repaired the potential transformer.
13	04/11	6		x						x			x	x	Substation fault due to 46 kV bus insulator flashover; Replaced failed insulator.
14	04/16	2		x		x				x			x	x	46 kV line fault due to jumper in contact with a pole; Repaired the pole.
15	04/21	1					x			x			x	x	Voltage above expected levels; Made corrections to the substation regulator controls.
16	04/26	1				x				x			x		46 kV line fault, cause unknown; Cleared fault and restored system.
17	04/30	1		x						x			x	x	46 kV line fault due to pole fire; Replaced the failed pole.
18	05/01	2		x						x			x	x	Substation fault due to animal; No damage found, returned the system to normal.
19	05/03	1		x						x			x	x	138 kV line fault due to lightning and subsequent conductor failure; Repaired the conductor.
20	05/06	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM.
21	05/11	2		x						x			x	x	Substation fault due to animal; No damage found, returned the system to normal.
22	05/11	1		x						x			x	x	46 kV line fault due to conductor failure; Repaired the conductor.
23	05/15	1		x								x	x		Electrical fault in customer plant.
24	05/24	3		x		x				x			x	x	Substation fault due to failed circuit breaker; Replaced the failed circuit breaker.
25	05/31	1				x				x			x	x	46 kV line fault due to pole fire; Repaired the pole.
26	06/04	1		x								x	x		Electrical fault in customer plant.
27	06/13	1		x						x			x	x	46 kV line fault due to failed distribution crossarm; Replaced the cross arm.
28	07/02	1							x			x	x		Electrical fault in customer plant.
29	07/05	6		x						x			x	x	46 kV line fault due to failed insulators; Replaced the insulators.
30	07/17	2				x					x		x		138 kV line fault, cause unknown; Cleared fault and restored system.
31	07/18	1		x							x		x	x	Substation fault due to bird nest materials; METC removed nests from substation.
32	07/21	4		x							x		x		345 kV line fault, cause unknown; Cleared fault and restored system.
33	07/23	2		x						x			x		46 kV line fault due to a tree; Cleared fault and restored system.
34	07/23	1				x						x	x		Electrical fault in customer plant.

Inquiries			Power Quality Event [4]							Source of PQ Event			Outcomes		
Event	Date	Locations Impacted [5]	Transient	Voltage Sag	Voltage Swell	Interruption	Overvoltage	Undervoltage	Other (inc. Harmonics)	Consumers Energy [6]	Transmission Provider [7]	Customer [8]	Customer Contact [9]	Modifications [10]	Description
35	07/26	4		x						x			x		46 kV line fault, cause unknown; Cleared fault and restored system.
36	07/27	1		x							x		x		138 kV line fault due to lightning; Cleared fault and restored system.
37	08/06	1							x			x	x		Customer reported equipment problems, but only issue identified was customer generated harmonics.
38	08/10	1		x						x			x		46 kV line fault due to tree contact; Cleared fault and restored system.
39	08/14	2							x			x	x		Customer claimed voltage was low, but the PQM showed the voltage to be within tolerance.
40	08/14	1		x						x			x	x	Voltage disruption experienced during the removal of a mobile substation; Returned normal substation to service.
41	08/23	1		x							x		x		138 kV line fault, cause unknown; Cleared fault and restored system.
42	08/27	1		x						x			x	x	46 kV line fault due to a failed structure; Replaced failed structure.
43	09/01	1		x						x			x	x	Substation fault due to failed capacitor bank; Removed capacitor bank from service and scheduled a replacement.
44	09/14	1		x						x			x	x	46 kV line fault due to pole fire; Replaced the failed pole.
45	09/24	1	x							x			x	x	Customer experienced voltage transients during a 46 kV line outage; Returned the system to normal configuration.
46	10/13	1		x						x			x	x	46 kV line fault due to broken crossarm; Replaced the crossarm.
47	10/14	1				x						x	x		Electrical fault in customer plant caused substation fuses to open; Coordinated with customer to restore substation to service.
48	10/16	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM.
49	10/22	1							x			x	x		Customer reported equipment trips, investigation showed customer equipment malfunctioning.
50	10/28	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM.
51	11/06	1					x			x			x	x	Voltage above expected levels; Replaced the substation regulator controls.
52	12/15	1		x								x	x		Electrical fault in customer plant.
53	12/21	4		x							x		x		345 kV line fault; cause unknown; Cleared fault and restored system.

Inquiries			Power Quality Event [4]							Source of PQ Event			Outcomes		
Event	Date	Locations Impacted [5]	Transient	Voltage Sag	Voltage Swell	Interruption	Overvoltage	Undervoltage	Other (inc. Harmonics)	Consumers Energy [6]	Transmission Provider [7]	Customer [8]	Customer Contact [9]	Modifications [10]	Description
54	12/21	1		x						x			x		46 kV line fault during high wind; Cleared fault and restored system.
		83[11]	**1**	**34**	**1**	**8**	**2**	**1**	**10**	**30**	**8**	**16**	**54**	**24**	

Power Quality Summary

None of the power quality issues referenced in the above table resulted in a formal MPSC complaint. Additionally, Consumers Energy shares information gathered from its PQMs with customers via its Customer Account Managers in response to requests regarding power factor, equipment loading, high energy usage, billing comparisons, and other general inquiries.

Respectfully submitted,

Dated: March 29, 2013 CONSUMERS ENERGY COMPANY

[11] These 83 locations represent 39 unique customer locations.