Consumers Energy
Count on Us

A CMS Energy Company

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March 30, 2012

Ms. Mary Jo Kunkle
Executive Secretary
Michigan Public Service Commission
6545 Mercantile Way
P.O. Box 30221
Lansing, MI 48909

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: 2012.03.30 10:20:29 -04'00'

Raymond E. McQuillan

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

fl0312-1-241

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 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's January 1, 2011, through December 31, 2011, results and compliance status per those requirements.

[1]System Average Interruption Frequency Index ("SAIFI") represents the average number of interruptions per customer per year.
[2]Customer Average Interruption Duration Index ("CAIDI") represents the average restoration time per outage.
[3]System Average Interruption Duration Index ("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.

	All Conditions						Excluding Major Event Days per IEEE 1366-2003					
	SAIDI		SAIFI		CAIDI		SAIDI		SAIFI		CAIDI	
Year	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.	Annual	5 Yr Avg.
2002	352		1.44		246		196		1.15		170	
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

The customer service restoration workload increased dramatically in 2011 when compared to the prior two years. Similarly, while not part of this report, public safety wire down workload also increased dramatically in 2011. This increase in workload is directly related to the observed increases in annual SAIFI results for both all and excluded MED conditions in the table above. To achieve a more "apples to apples" comparison, results excluding MED conditions will be utilized going forward.

The 2011 SAIFI excluding MED conditions increased by 29.5% and 30.8% when compared to 2009 and 2010, respectively. A key variable that drove these SAIFI increases directly correlates to the volume of challenges which our electric distribution system endured in

2011 as opposed to 2009 and 2010. Table 1 below summarizes the number of severe weather warnings (thunderstorms and tornadoes), icing observations, and lightning strikes for the Lower Peninsula of Michigan based on information derived from the National Weather Service and United States Precision Lightning Network data. Simply put, when compared to recent history, 2011 was a year in which our electric distribution system was most significantly challenged.

Table 1

Weather Event Summary, Major Event Days Excluded

			Observed Event Count		
		Year	Warnings Issued	Icing Observations	Lightning Strikes
		2009	91	80	309,000
		2010	230	68	938,000
		2011	324	180	1,094,000
				Percent Increase	
Year	v.	Year	Warnings	Icing	Lightning
2009	v.	2011	256%	165%	254%
2010	v.	2011	41%	125%	17%
Ave(2009,2010)	v.	2011	102%	143%	75%

In spite of this tremendous increase in customer service restoration workload of approximately 30% (SAIFI), the average duration (CAIDI) of customer outages for these same conditions did not degrade to this same level.

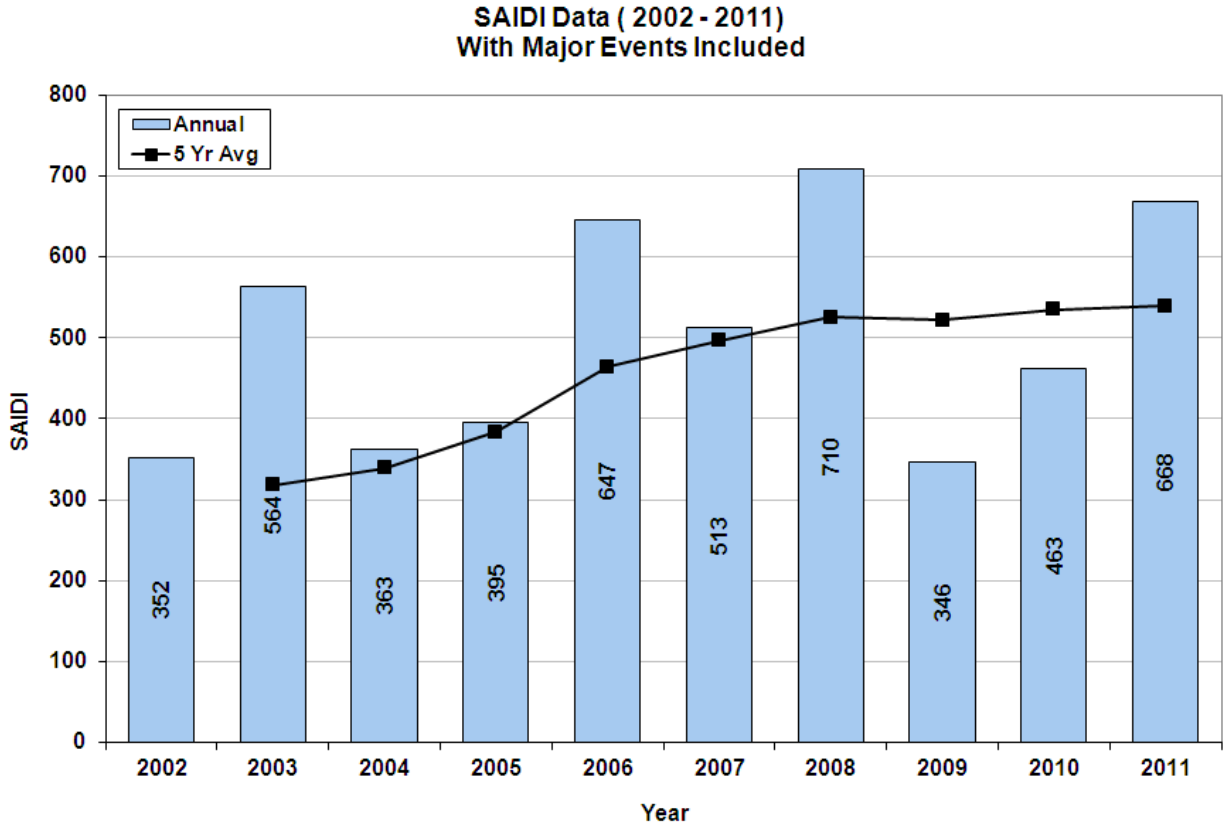
In 2011, Consumers Energy implemented several tactics designed to improve its response to customer outages. Restoration pre-planning prior to expected weather events and regular weekend pre-planning was instituted to proactively establish response approaches based on anticipated weather impacts. The 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

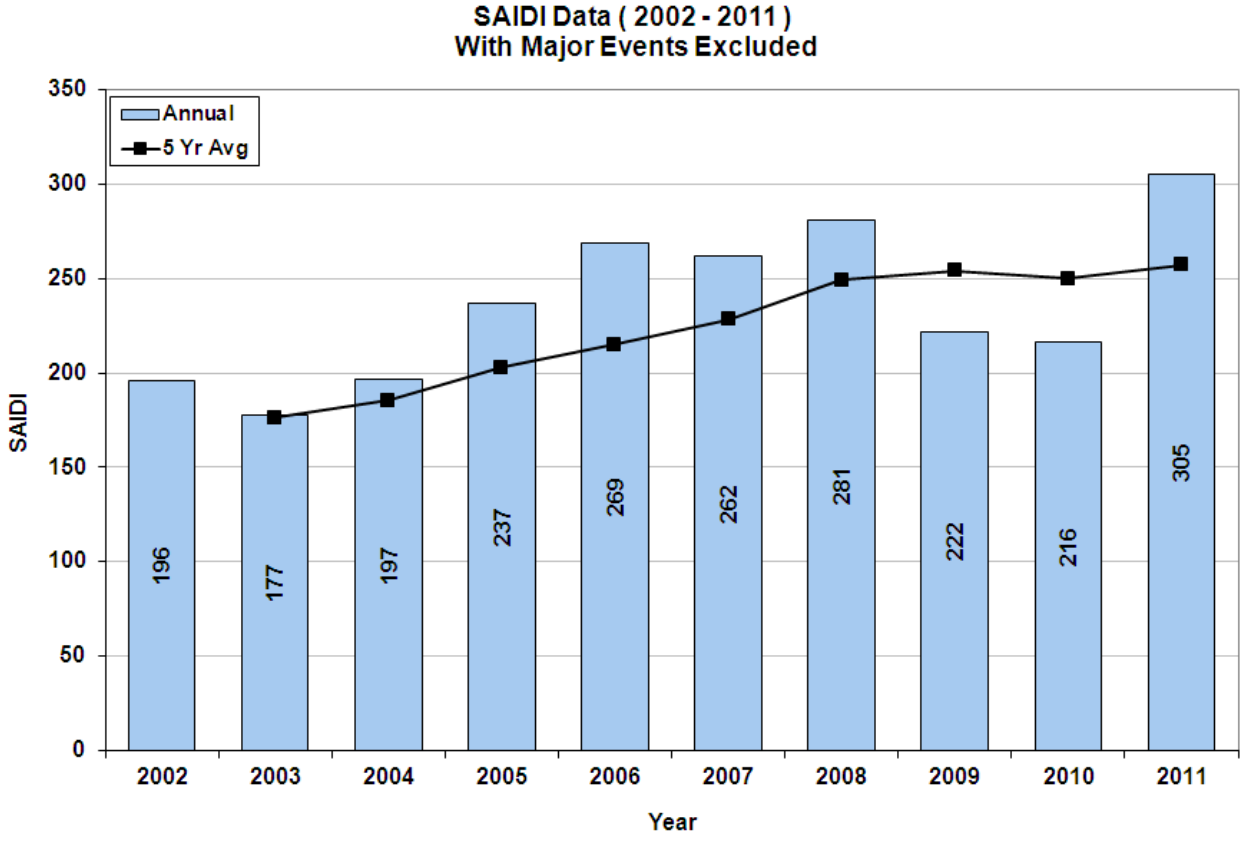
out-of-state) was initiated earlier during, or prior to, weather events to increase resource availability in the initial phase of restoration. These tactics allowed the Company to overcome the large customer service restoration workload (SAIFI) in 2011 relative to 2009 and 2010 resulting in a relatively smaller average duration increase (CAIDI) for these same years. Success of these restoration tactics is also evident in the Company's improved Service Restoration Factor for Normal Conditions of 88.6% in 2011 (compared to 86.5% in 2009 and 85.5% in 2010) as reported in its March 2, 2012, filing in Case No. U-12270.

Reliability Indices Summary

Despite the setback of 2011 system performance metrics Consumers Energy is confident, assuming a more normal number of challenges to the electric distribution system going forward that a continuation of the tactics designed to improve its response to customer outages as described previously, along with its maintenance programs, reliability investments, and system hardening practices should produce improvement of the 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.





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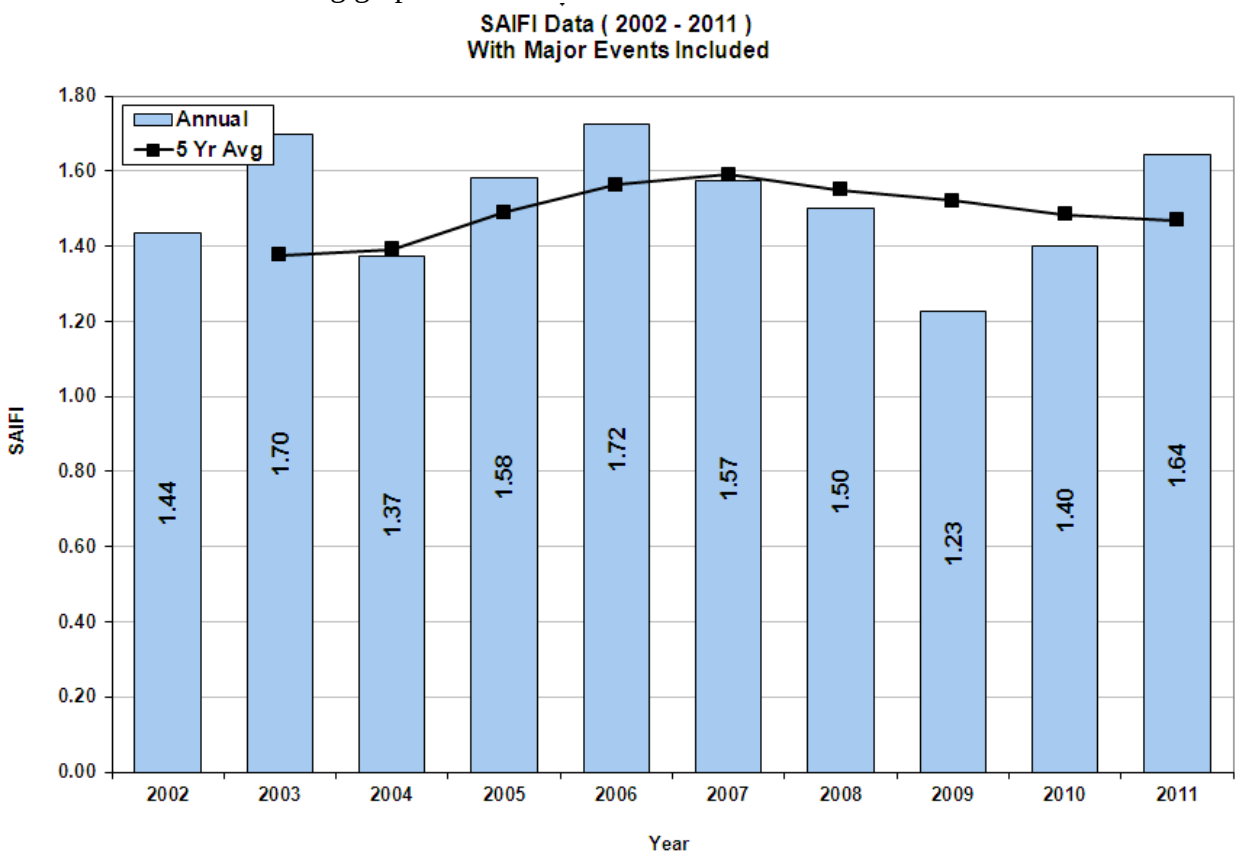
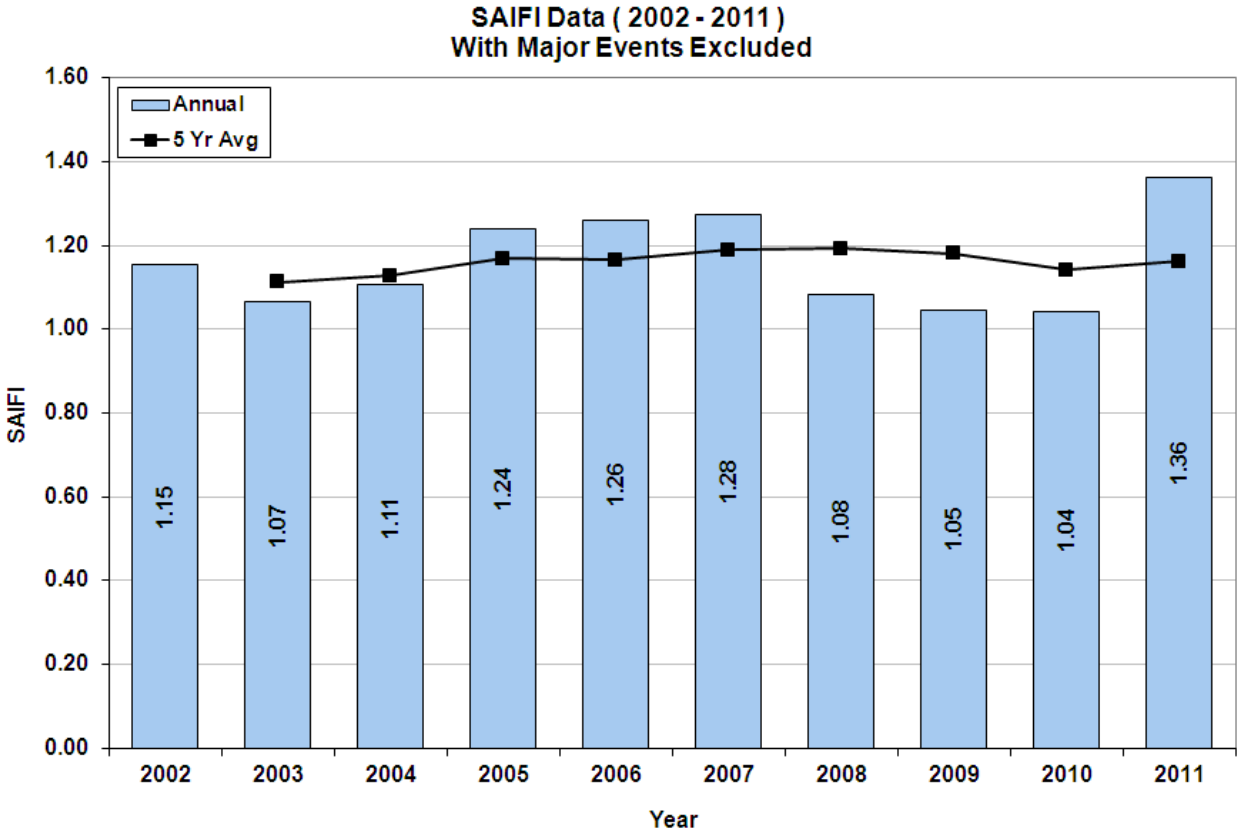
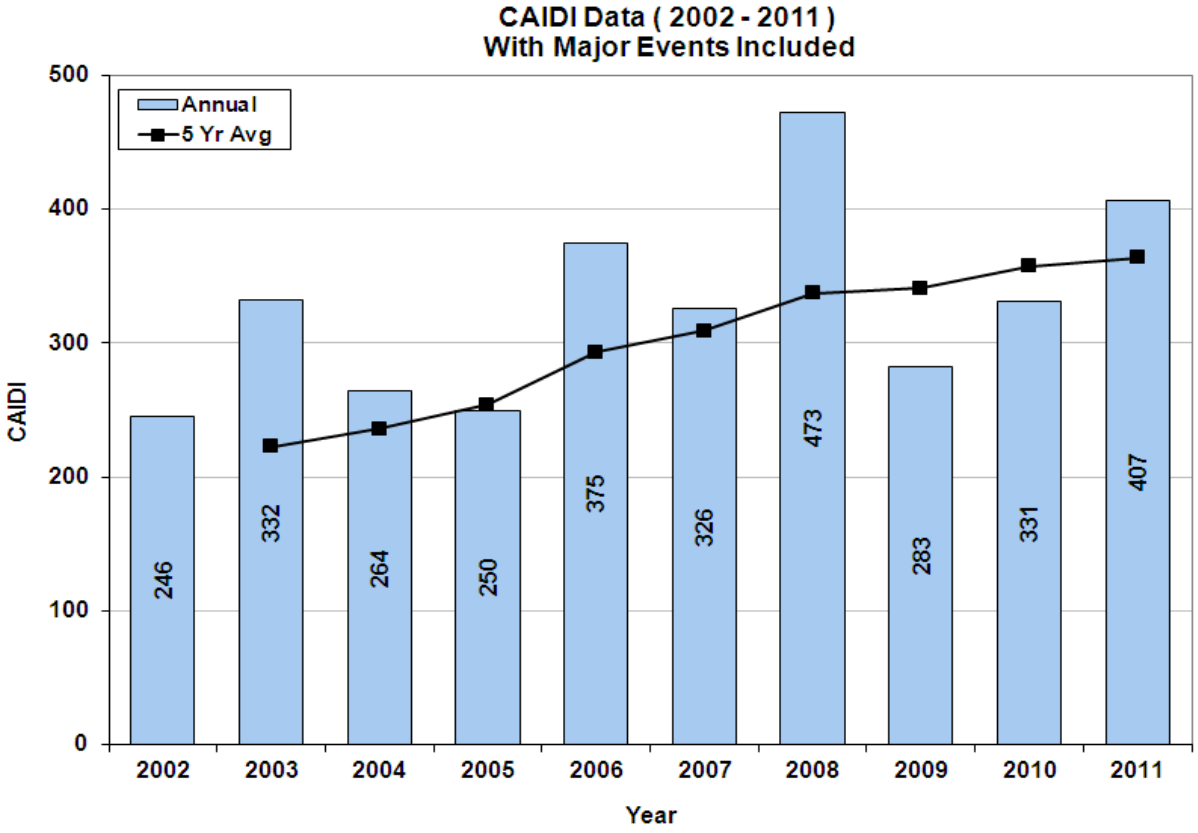
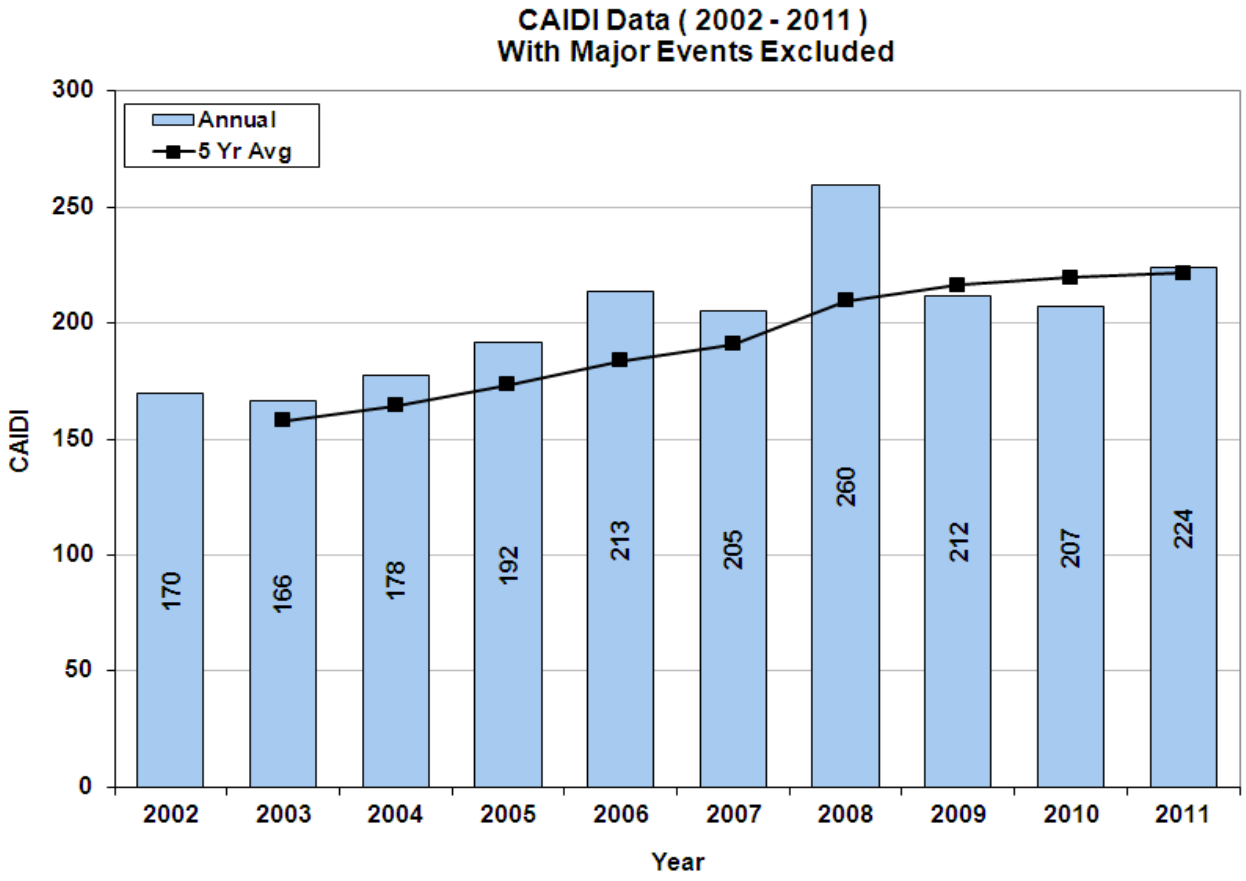




The annual and rolling five-year average values for CAIDI including and excluding major events are shown in the following graphs.





II) Power Quality Report

Power Quality Process

Consumers Energy continually monitors power quality at 222 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.

2011 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 2011 there were 53 power quality events which generated customer inquiries. Of these, 24 (approximately 45%) of the 53 events were attributable to the customer's electric system. The remaining 29 (approximately 55%) 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 19 of the 29 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 10 events (of 29) 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 2011 where power quality monitors 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	01/07	1							x			x	x		Customer claimed voltage was low, but the PQM showed the voltage to be within tolerance.
02	01/10	1							x			x	x		Customer reported equipment problems, but no events were recorded by the PQM. Harmonic currents were high; suggested that the customer correct this situation.
03	01/24	1		x								x	x		Electrical fault in customer plant
04	02/02	1		x								x	x		Electrical fault in customer plant
05	02/03	1		x						x			x	x	Substation fault due to failed insulator; Replaced insulator and returned the system to normal
06	02/15	1		x							x		x	x	138 kV line fault due to damaged guy wire; METC repaired the damaged guy wire
07	02/16	1					x					x	x	x	Scheduled outage caused high plant voltage; Returned equipment to service and offered a future voltage regulator project to customer
08	02/17	1		x						x			x	x	46 kV line fault due to pole fire; Replaced failed pole
09	02/20	3		x						x			x	x	46 kV line fault due to pole fire; Replaced failed pole
10	02/22	1				x				x			x	x	Substation fault due to failed insulator; Replaced insulator and returned the system to normal

[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	03/08	1		x						x			x	x	Substation fault due to failed lightning arrester; Replaced lightning arrester and returned the system to normal
12	03/09	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM that were of a severity to expect equipment malfunction
13	03/20	1							x			x	x		Customer reported equipment trips, but no events were recorded by the Power Quality Monitor (PQM)
14	03/29	1		x						x			x	x	46 kV line fault due to failed potential transformer; Replaced transformer and returned the system to normal
15	03/29	1							x			x	x		Customer reported equipment trips, but no events were recorded by the Power Quality Monitor (PQM)
16	04/10	1							x			x	x		Customer reported voltage sag, but no events were recorded by the Power Quality Monitor (PQM)
17	05/05	5		x							x		x		345 kV line fault due to unknown cause; Cleared fault and restored system
18	05/11	1					x			x			x	x	Customer reported occasional high voltage tripping equipment; Adjusted transformer taps to lower the voltage
19	05/12	1		x								x	x		Electrical fault in customer plant
20	05/15	3		x						x			x	x	Substation fault due to failed insulators; Replaced insulators and returned the system to normal
21	06/07	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM that were of a severity to expect equipment malfunction
22	06/28	1		x								x	x		Electrical fault in customer plant
23	07/03	1							x			x	x		Customer reported voltage sag, but no events were recorded by the Power Quality Monitor (PQM)
24	07/13	1							x			x	x		Customer reported voltage sag, but no events were recorded by the Power Quality Monitor (PQM)
25	07/18	1						x		x			x	x	Equipment outage caused low voltage; Returned equipment to service.
26	07/19	1							x			x	x		Electrical fault in customer plant
27	07/21	1							x			x	x		Customer reported voltage sag, but no events were recorded by the Power Quality Monitor (PQM)
28	07/26	1		x							x		x	x	345 kV line fault due to failed conductor; METC repaired the damaged conductor

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
29	07/29	4		x						x			x		46 kV line fault due to lightning; Cleared fault and restored system
30	08/09	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM that were of a severity to expect equipment malfunction
31	08/12	1							x			x	x		Customer reported equipment trips, but no events were recorded by the Power Quality Monitor (PQM)
32	08/13	1		x						x			x		46 kV line fault due to lightning; Cleared fault and restored system
33	08/21	3		x							x		x	x	138 kV line fault due to failed guy wires; METC repaired the damaged guy wires
34	08/22	3		x							x		x	x	138 kV line fault due to failed conductor; METC repaired the damaged conductor
35	09/05	1							x			x	x		Customer reported equipment trips, but no events were recorded by the PQM that were of a severity to expect equipment malfunction
36	09/19	1				x				x			x	x	Customer interrupted due to incorrect relay setting; Relay setting corrected
37	09/26	3		x						x			x	x	46 kV line fault due to failed shield wire following lightning strikes; Repaired the damaged shield wire
38	09/29	1		x						x			x		46 kV line fault due to unknown cause; Cleared fault and restored system
39	10/05	1							x			x	x		Customer reported voltage sag, but no events were recorded by the Power Quality Monitor (PQM)
40	10/10	3		x						x			x		Substation fault due to animal contact; Cleared fault and restored system
41	10/11	1							x			x	x		Customer claimed voltage was low, but the PQM showed the voltage to be within tolerance.
42	10/11	1		x						x			x	x	Substation fault due to failed lightning arrester; Replaced arrester and returned the system to normal
43	10/13	1							x			x	x		Customer reported voltage flicker, but no events were recorded by the Power Quality Monitor (PQM)
44	10/19	1		x						x			x		BCEL&P 46 kV line fault due to failed conductor; Cleared fault and restored system
45	10/27	2		x		x				x			x	x	Substation fault due to animal contact and failed insulators; Replaced insulators and returned the system to normal
46	11/12	1		x						x			x		46 kV line fault during switching; 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
47	11/16	1							x			x	x		Customer reported voltage sag, but no events were recorded by the Power Quality Monitor (PQM)
48	11/20	1		x						x			x		46 kV line fault due to tree contact; Cleared fault and restored system
49	11/29	1		x							x		x		138 kV line fault due to unknown cause; Cleared fault and restored system
50	12/07	1							x			x	x		Electrical fault in customer plant
51	11/12	1		x						x			x		46 kV line fault during switching; Cleared fault and restored system
52	11/29	1		x							x		x		138 kV line fault due to galloping conductors; Cleared fault and restored system
53	12/20	1						x		x			x	x	Equipment outage caused low voltage during starting of large motor; Returned equipment to service.
	53	**73**[11]	**0**	**28**	**0**	**3**	**2**	**2**	**19**	**22**	**7**	**24**	**53**	**19**	

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 power quality monitors 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 30, 2012 CONSUMERS ENERGY COMPANY

[11]These 73 locations represent 38 unique customer locations.