

DTE Electric Company
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DTE Energy®



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April 24, 2013

Ms. Mary Jo Kunkle
Executive Secretary
Michigan Public Service Commission
6545 Mercantile Way, Suite 15
Lansing, MI 48911

Re: In the matter on the Commission's own motion, to provide electric power
reliability information in its annual power quality report
MPSC Case No. U-16065

Dear Ms. Kunkle:

Pursuant to the Commission's September 15, 2009 Opinion and Order in the above-referenced matter, attached please find DTE Electric Company's January 1, 2012 through December 31, 2012 Report to the Michigan Public Service Commission Regarding Electric Distribution System Power Quality.

Yours truly,

Michael J. Solo

MJS/lah
Attachments

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter, on the Commission's own motion,)
to provide electric power reliability information)
in its annual power quality report)
_____)

Case No. U-16065

DTE ELECTRIC COMPANY
JANUARY 1, 2012 THROUGH DECEMBER 31, 2012 REPORT
TO THE MICHIGAN PUBLIC SERVICE COMMISSION REGARDING
ELECTRIC DISTRIBUTION SYSTEM POWER QUALITY

Background

On September 15, 2009, the Michigan Public Service Commission issued an Opinion and Order in Case No. U-16065, in which it directed that the two major Michigan utilities 1) provide information related to SAIFI, CAIDI, and SAIDI reliability indices with and without major events, on a rolling five year average basis, using the industry standard 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 the DTE Electric Company January 1, 2012 through December 31, 2012 results and compliance status per those requirements.

**Reliability Performance and Power Quality Resolution Process
DTE Electric Company – MPSC Annual Report 2012**

1. 2012 Reliability Performance

Reliability data is presented below in tabular form for both all weather conditions and without major event days (MEDs) as defined per IEEE 1366-2003.

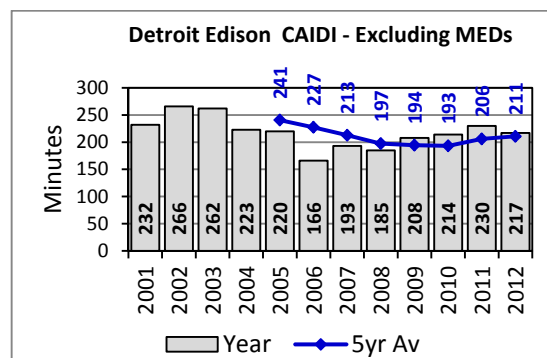
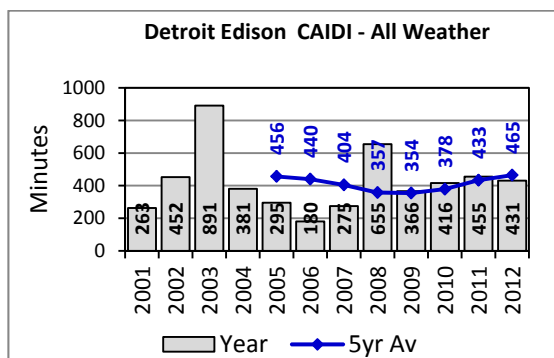
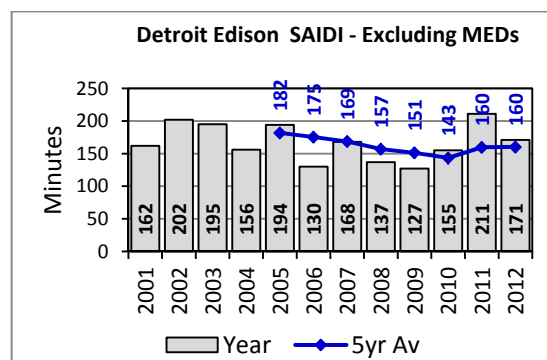
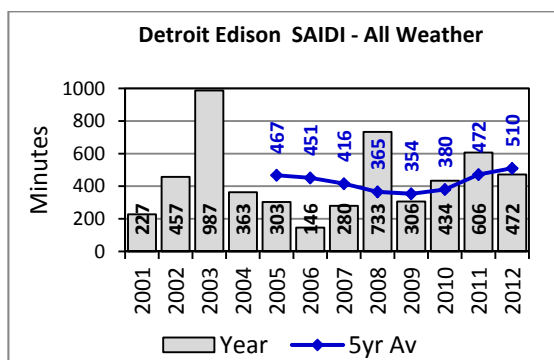
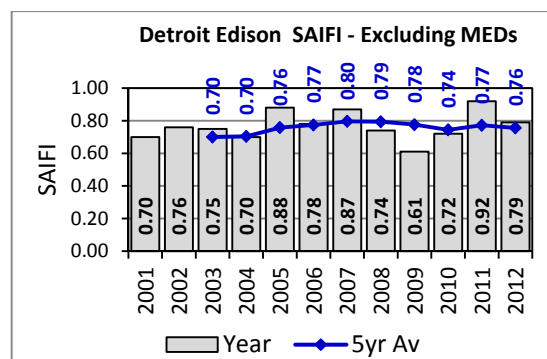
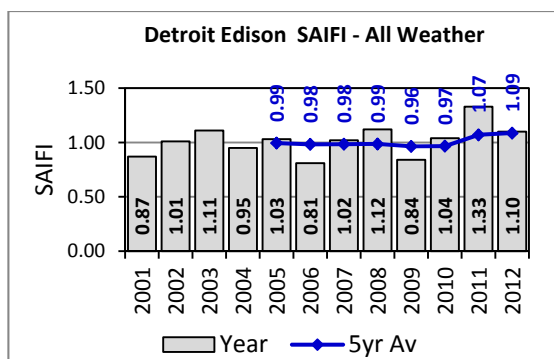
	All Weather						Excluding MEDs per IEEE 1366-2003					
	SAIFI		SAIDI		CAIDI		SAIFI		SAIDI		CAIDI	
Year	Year	5 yr Avg.	Year	5 yr Avg.	Year	5 yr Avg.	Year	5 yr Avg.	Year	5 yr Avg.	Year	5 yr Avg.
2001	0.87		227		263		0.70		162		232	
2002	1.01		457		452		0.76		202		266	
2003	1.11		987		891		0.75	0.70	195		262	
2004	0.95		363		381		0.70	0.70	156		223	
2005	1.03	0.99	303	467	295	456	0.88	0.76	194	182	220	241
2006	0.81	0.98	146	451	180	440	0.78	0.77	130	175	166	227
2007	1.02	0.98	280	416	275	404	0.87	0.80	168	169	193	213
2008	1.12	0.99	733	365	655	357	0.74	0.79	137	157	185	197
2009	0.84	0.96	306	354	366	354	0.61	0.78	127	151	208	194
2010	1.04	0.97	434	380	416	378	0.72	0.74	155	143	214	193
2011	1.33	1.07	606	472	455	433	0.92	0.77	211	160	230	206
2012	1.10	1.09	472	510	431	465	0.79	0.76	171	160	217	211

Notes: Excludes 2003 Blackout

After a volatile weather year in 2011 that adversely impacted reliability performance, performance in 2012 returned to near historic levels. In 2012, all six indices showed an improvement from 2011: All Weather SAIFI 17%, SAIDI 22%, and CAIDI 5%; Excluding MED SAIFI 14%, SAIDI 19%, and CAIDI 6%. For 2013, a Duration Reduction program is underway focusing on system modifications to enable faster restoration and restore-before-repair capability.

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Reliability data is presented below in graphical form for both all weather conditions and without major event days (MEDs) as defined per IEEE 1366-2003.



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2. Power Quality Inquiry Process

DTE Electric has a proven effective process in place that enables its large industrial and commercial customers typically served off the subtransmission or transmission system to obtain resolution of power quality issues. The customers contact their assigned account representative who in turn starts the process of helping the customer by engaging the appropriate engineer in Distribution Operations.

The response to the customer normally includes the following steps:

- (1) Obtain pertinent information about what is troubling the customer (old or new equipment, one device or many)
- (2) Gather the dates and times from the customer to correlate with EMS Alarm Logger events (cap switching, line trips)
- (3) Correlate the customer's experiences with the power quality meters at his service point or with power quality meters in the area
- (4) Meet with the customer about the correlation of system and customer events.

Based on the correlation of DTE Electric and customer events, the following outcomes or additional steps are possible:

- (1) Special power quality monitoring (DTE or customer) could be installed to determine customer equipment sensitivity and source of problem
- (2) Customer conducts site survey to determine if his operating voltage is optimal
- (3) Trouble with minor sags from DTE system (sensitive equipment) - customer's responsibility to make compatible
- (4) Internal system trouble - customer's responsibility to make equipment compatible
- (5) ITC/DTE will seek resolution of problems caused on the ITC/DTE systems where the customer equipment wouldn't be expected to have ride-through to significant voltage sags. The rate of occurrence, system exposure and service method determine if remedies are commercially feasible.

3. Power Quality Monitoring

DTE Electric has an array of power quality meters across its system at key industrial, subtransmission, and distribution buses that have proven to be very effective. New meters are installed at new or upgraded industrial substations and on subtransmission buses.

The power quality meters at the industrial locations allow DTE Electric to correlate the recorded voltage sags with system events from the SCADA-EMS system. This system provides DTE Electric with information unique to the customer and a tool to track the performance of the system. The system performance data is used to prioritize capital improvements and system maintenance.

The power quality meters on the subtransmission and distribution buses provide system performance data plus the ability to calculate the probable locations of faults on the lines. This

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information will reduce the time and cost to find causes of voltage sags and facilitate repair the system when necessary.

Also, voltage sags on the DTE Electric system can be correlated with faults on the ITC-Transmission system. The DTE Electric power quality data is shared with ITC for the benefit of resolving customer power quality issues.

4. 2012 Power Quality Inquiries Summary

The data below indicates the total number of power quality issues brought to the attention of DTE Electric – Distribution Operations in 2012. Each power quality issue is categorized by service methods, power quality events, source of events and actions taken.

Inquiries			Power Quality Event ¹							Source of PQ Event			Inquiry Numbers
Month	Total	Loc. Impacted ²	Transient	Voltage Sag	Voltage Swell	Interruption	Over voltage	Under voltage	Other	DTE ³	ITC ⁴	Customer ⁵	
Jan	20	22		18		3			1	7	2	2	1554, 1557, 1558, 1559, 1581, 1585, 1587, 1590, 1591, 1592, 1594, 1595, 1603, 1604, 1605, 1606, 1609, 1614
Feb	3	3		1		2							1507, 1560, 1605
Mar	13	31		29		2							1561, 1568, 1581, 1586, 1591, 1604, 1605
Apr	5	5		4		1							1590, 1592, 1593, 1605
May	12	16		15		1							1581, 1582, 1583, 1590, 1593, 1596, 1604, 1605, 1608, 1610, 1611
June	6	6		5		1				4		1	1583, 1590, 1592, 1593, 1605, 1613
July	15	15		15						7	3	1	1581, 1587, 1592, 1604, 1605, 1607
Aug	11	11		10		1				7		1	1587, 1581, 1583, 1592, 1605, 1608
Sept	2	3		2		1				2		1	1577, 1581, 1607
Oct	33	34		34						9		1	1581, 1582, 1583, 1592, 1604, 1605, 1607, 1609
Nov	8	9		9						2			1580, 1582, 1583, 1584, 1588, 1590, 1608, 1612, 1615
Dec		1		1						1			1605
Year	128	156		143		12			1	39	5	7	

1 Voltages and durations (IEEE Std 1159 Table 2 – Categories and Typical Characteristics of Power System Phenomena)

2 Number of customer locations impacted

3 Equipment owned by DTE (120, 40, 24, 13.2 and 4.8 kV)

4 Equipment owned by ITC (345, 230 and 120 kV)

5 Equipment owned by the customer or other power systems not owned by DTE or ITC

6 Inquiry numbers – event detail provided in the table below

The number of locations impacted and identified by power quality monitors, system monitors and customers inquiries was 156 during 2012 which was less than the 2011 total. The total number of customer inquiries was 126 since customers combine events into single inquiries. The follow-up investigations indicate that most of the power quality events were due to either voltage

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sags (92%) or interruptions (8%) and correlated with trouble occurring on the DTE Electric (76%) and ITC (10%) systems. Other inquiries were determined to be a result of events occurring on customer systems (14%). Of the events on the DTE Electric or ITC system, 57% were attributed to adverse weather or vehicular, animal, or other interference. Trees were the suspected cause for many of the unknowns. Along with line clearance, modifications such as operating practice changes, equipment changes, adding animal protection and/or equipment are typical actions taken to reduce the occurrences of the events.

The following table lists addition information about each inquiry.

Inquiry	Date - Time	System Event	PQ Event	Comments
1554	1/8 - 0040	Norway Substation	Other	Customer equipment
1605	1/13 - 0756	Superior Trk 1502	Voltage Sag	Cable failure
1581	1/13 - 0756	Superior Trk 1502	Voltage Sag	Cable failure
1604	1/13 - 0756	Superior Trk 1502	Voltage Sag	Cable failure
1590	1/17 - 1216	Sterling Trk 2713	Interruption	Interference, vehicle, wire down
1592	1/17 - 1552	Brock Trk 8414	Voltage Sag	Pole equipment failure
1591	1/22 - 2326	Dayton – Romulus Tie 7733	Voltage Sag	Unknown
1609	1/22 - 2346	Waterman – Zug	Voltage Sag	Interference (DIGM-NAVAR-WTRMN)
1587	1/22 - 2346	Waterman – Zug	Voltage Sag	Interference (DIGM-NAVAR-WTRMN)
1585	1/22 - 2346	Waterman – Zug	Voltage Sag	Interference (DIGM-NAVAR-WTRMN)
1595	1/22 - 2346	DIGM – Navarre – Watermen	Voltage Sag	Line equipment failure
1603	1/22 - 2346	DIGM – Navarre – Watermen	Voltage Sag	Line equipment failure
1592	1/22 - 2346	DIGM – Navarre – Watermen	Voltage Sag	Line equipment failure
1557	1/22 - 2346	DIGM – Navarre – Watermen	Voltage Sag	Line equipment failure
1594	1/22 - 2346	DIGM – Navarre – Watermen	Voltage Sag	Line equipment failure
1606	1/22 - 2346	DIGM – Navarre – Watermen	Voltage Sag	Line equipment failure
1558	1/23 - 0837	Noble Substation	Voltage Sag	Customer equipment
1559	1/27 - 1732	Baltic Trk 8215	Interruption	Unknown
1581	1/28 - 1139	Argo – Lark Tie 4501	Voltage Sag	Interference, tree, weather
1581	1/28 - 1316	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	1/28 - 1316	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	2/6 - 0719	Lark – Saline Tie 4512	Voltage Sag	Unknown
1560	2/6 - 2305	Praxair Substation	Interruption	Customer equipment
1507	2/13 - 1756	Baltic Trk 8215	Interruption	Unknown
1605	3/2 - 2143	Pioneer – Saline Tie 7408	Voltage Sag	Interference, tree, weather
1581	3/2 - 2152	Superior Trk 1502	Voltage Sag	Unknown, weather
1605	3/2 - 2234	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/2 - 2234	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/2 - 2257	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/2 - 2309	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/2 - 2315	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/2 - 2315	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/2 - 2331	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/2 - 2331	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/2 - 2346	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/2 - 2346	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/3 - 0007	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather

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1605	3/3 - 0015	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/3 - 0027	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1604	3/3 - 0030	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/3 - 0041	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1604	3/3 - 0045	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1604	3/3 - 0105	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1581	3/3 - 0105	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/3 - 0105	Argo – Superior Tie 1531	Voltage Sag	Pole equipment failure, weather
1605	3/6 - 1615	Carpenter – Superior – York Tie 1568	Voltage Sag	Unknown
1591	3/7 - 1351	Dayton – Raisin Tie 1473	Voltage Sag	Unknown
1586	3/12 - 2352	Custer – Monroe	Voltage Sag	Failed AC Circuit Equipment
1605	3/14 - 1616	Carpenter – Superior – York Tie 1568	Voltage Sag	Pole equipment failure
1581	3/15 - 1808	Phoenix Trk 5510	Voltage Sag	Unknown, weather
1581	3/16 - 2007	Phoenix Trk 5510	Voltage Sag	Unknown, weather
1561	3/21 - 0533	Burns Substation	Voltage Sag	Customer equipment
1568	3/25 - 0857	Baltic Trk 8215	Interruption	Unknown
1605	3/30 - 1445	Carpenter – Luzon Tie 3705	Voltage Sag	Unknown
1604	3/30 - 1717	Superior Trk 1527	Interruption	Unknown
1590	4/16 - 1241	Sterling Trk 2742	Interruption	Unknown, weather
1593	4/16 - 1241	Sterling Trk 2742	Voltage Sag	Unknown, weather
1592	4/16 - 1508	Brock Trk 8409	Voltage Sag	Unknown, weather
1605	4/17 - 0219	Pioneer – Saline Tie 7408	Voltage Sag	Pole equipment failure, weather
1605	4/18 - 1556	Saline – York Tie 1568	Voltage Sag	Unknown
1605	5/2 - 1330	Carpenter – Superior – York Tie 1568	Voltage Sag	Pole equipment failure
1608	5/4 - 0013	Northeast Trk 416	Voltage Sag	Line equipment failure, weather
1582	5/4 - 0013	Northeast Trk 416	Voltage Sag	Line equipment failure, weather
1583	5/4 - 0013	Northeast Trk 416	Voltage Sag	Line equipment failure, weather
1608	5/4 - 0043	Northeast Trk 416	Voltage Sag	Cable failure
1582	5/4 - 0043	Northeast Trk 416	Voltage Sag	Cable failure
1583	5/4 - 0043	Northeast Trk 416	Voltage Sag	Cable failure
1610	5/4 - 0237	Belle River – Pontiac	Voltage Sag	Lightning strike
1611	5/4 - 0237	Belle River – Pontiac	Voltage Sag	Lightning strike
1608	5/4 - 1314	Northeast Bus 12	Voltage Sag	Equipment failure
1581	5/8 - 0833	Superior Trk 1518	Voltage Sag	Unknown
1605	5/8 - 0833	Superior Trk 1518	Voltage Sag	Unknown
1604	5/8 - 0833	Superior Trk 1518	Voltage Sag	Unknown
1596	5/25 - 0809	Topaz Substation	Interruption	Interference, animal
1590	5/29 - 0209	Sterling Trk 2719	Voltage Sag	Pole equipment failure
1593	5/29 - 0209	Sterling Trk 2719	Voltage Sag	Pole equipment failure
1583	6/1 - 0646	Press Plant Substation	Voltage Sag	Customer equipment
1613	6/14 - 1647	Noble Substation	Interruption	Interference, animal
1605	6/18 - 1256	Dorset Trk 6508	Voltage Sag	Unknown
1590	6/21 - 1712	Sterling Trk 2715	Voltage Sag	Lightning strike
1593	6/21 - 1712	Sterling Trk 2715	Voltage Sag	Lightning strike
1592	6/29 - 1601	Brock Trk 8409	Voltage Sag	Unknown
1607	7/3 - 1302	Durant - Placid	Voltage Sag	Unknown
1607	7/5 - 0415	Genoa – Latson	Voltage Sag	Unknown, weather
1581	7/5 - 0440	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown, weather
1605	7/5 - 0445	Saline – York Tie 1568	Voltage Sag	Unknown, weather

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1605	7/5 - 1241	Piedmont – Pioneer Tie 7430	Voltage Sag	Unknown, weather
1581	7/10 - 2246	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown
1604	7/10 - 2246	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown
1605	7/10 - 2247	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown
1605	7/12 - 1337	Argo – Phoenix Tie 5517	Voltage Sag	Unknown
1581	7/12 - 1337	Argo – Phoenix Tie 5517	Voltage Sag	Unknown
1604	7/12 - 1337	Argo – Phoenix Tie 5517	Voltage Sag	Unknown
1605	7/21 - 1908	Saline – Superior Tie 1568	Voltage Sag	Unknown
1592	7/21 - 2154	Explorer Substation	Voltage Sag	Customer equipment
1607	7/26 - 0409	Genoa – Hurst	Voltage Sag	Lightning strike
1587	7/31 - 0430	Voyager Substation	Voltage Sag	Interference - animal
1592	8/5 - 1141	Explorer Substation	Voltage Sag	Customer equipment
1605	8/5 - 2019	Superior – York Tie 1568	Voltage Sag	Unknown
1605	8/9 - 2242	Piedmont – Saline Tie 7430	Voltage Sag	Unknown
1581	8/10 - 1625	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Cable failure
1605	8/10 - 1626	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Cable failure
1581	8/10 - 1908	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Cable failure
1605	8/10 - 2358	Piedmont – Pioneer Tie 7430	Voltage Sag	Unknown
1581	8/12 - 1424	Argo – Lark Tie 4501	Voltage Sag	Unknown
1608	8/18 - 1822	Northeast Trk 416-17	Voltage Sag	Unknown
1583	8/18 - 1822	Northeast Trk 416-17	Voltage Sag	Unknown
1577	8/25 - 1014	Sterling Trk 2713	Interruption	Unknown
1581	9/4 - 0846	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown
1577	9/4 - 1259	Sterling Trk 2713	Interruption	Unknown
1607	9/23 - 1544	Durant Substation	Voltage Sag	Customer equipment
1581	10/4 - 1706	Argo – Lark Tie 4501	Voltage Sag	Unknown
1581	10/7 - 0129	Superior Trk 1527	Voltage Sag	Unknown
1605	10/7 - 0129	Superior Trk 1527	Voltage Sag	Unknown
1592	10/9 - 1039	Brock Trk 8409	Voltage Sag	Interference - animal
1583	10/10 - 1649	Northeast Trk 416-17	Voltage Sag	Interference - balloon
1582	10/10 - 1649	Northeast Trk 416-17	Voltage Sag	Interference - balloon
1608	10/10 - 1649	Northeast Trk 416-17	Voltage Sag	Interference - balloon
1608	10/11 - 1435	Northeast Trk 416-17	Voltage Sag	Interference - balloon
1583	10/11 - 1435	Northeast Trk 416-17	Voltage Sag	Interference - balloon
1582	10/11 - 1435	Northeast Trk 416-17	Voltage Sag	Interference - balloon
1581	10/13 - 1230	Pioneer – Superior Tie 1544	Voltage Sag	Unknown, weather
1605	10/13 - 1230	Pioneer – Superior Tie 1544	Voltage Sag	Unknown, weather
1604	10/13 - 1230	Pioneer – Superior Tie 1544	Voltage Sag	Unknown, weather
1581	10/14 - 1417	Superior Trk 1527	Voltage Sag	Unknown, weather
1605	10/14 - 1417	Superior Trk 1527	Voltage Sag	Unknown, weather
1581	10/18 - 0139	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown
1604	10/18 - 0139	Argo – Lark – Phoenix Tie 5513	Voltage Sag	Unknown
1607	10/19 - 1030	Durant Substation	Voltage Sag	Customer Equipment
1609	10/24 - 1419	Saturn Substation	Voltage Sag	Interference - Animal
1581	10/27 - 1706	Argo – Phoenix Tie 5517	Voltage Sag	Unknown, weather
1608	10/29 - 1634	Northeast Trk 416	Voltage Sag	Interference - private wire
1608	10/29 - 1931	Northeast Trk 416	Voltage Sag	Interference - private wire
1608	10/29 - 2140	Northeast Trk 416	Voltage Sag	Interference - private wire
1583	10/30 - 0424	Northeast Trk 416	Voltage Sag	Interference - private wire

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1608	10/30 - 0424	Northeast Trk 416	Voltage Sag	Interference - private wire
1582	10/30 - 0424	Northeast Trk 416	Voltage Sag	Interference - private wire
1583	10/30 - 0557	Northeast Trk 416	Voltage Sag	Interference - private wire
1608	10/30 - 0557	Northeast Trk 416	Voltage Sag	Interference - private wire
1582	10/30 - 0557	Northeast Trk 416	Voltage Sag	Interference - private wire
1608	10/30 - 0944	Northeast Trk 416	Voltage Sag	Interference - private wire
1581	10/30 - 1013	Argo – Lark Tie 4501	Voltage Sag	Unknown, weather
1608	10/30 - 1548	Northeast Trk 416	Voltage Sag	Interference - private wire
1583	10/30 - 1549	Northeast Trk 416	Voltage Sag	Interference - private wire
1582	10/30 - 1550	Northeast Trk 416	Voltage Sag	Interference - private wire
1583	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1590	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1584	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1582	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1580	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1588	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1612	11/7 - 1512	Ramville Trf 2	Voltage Sag	Equipment failure
1608	11/7 - 1513	Ramville Trf 2	Voltage Sag	Equipment failure
1605	12/11 - 1028	Carpenter – Superior – York Tie 1568	Voltage Sag	Unknown