

Emergency Demand Response (Load Management) Performance Report 2013/2014

April 2014

Version 2

(expect to update for 2014 event information not available at time of posting at later date)



PJM has made all efforts possible to accurately document all information in this report. However, PJM cannot warrant or guarantee that the information is complete or error free. The information seen here does not supersede the PJM Operating Agreement or the PJM Tariff both of which can be found by accessing: <http://www.pjm.com/documents/agreements/pjm-agreements.aspx>

For additional detailed information on any of the topics discussed, please refer to the appropriate PJM manual which can be found by accessing: <http://www.pjm.com/documents/manuals.aspx>



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Version History

Version 1 – published in March

Version 2 – published in April. Version 2 includes settlement and performance information for January non-mandatory events.

Executive Summary

Emergency Demand Resources have the ability to participate as a capacity resource in the PJM capacity market (Reliability Pricing Model or RPM) or to support a Load Serving Entities Fixed Resource Requirement (FRR) plan. For the 2013/2014 Delivery Year only Limited DR product type was available. The two new products (Summer Extended DR and Annual DR) do not become available until the 2014/2015 Delivery Year. A Curtailment Service Provider (CSP) is the PJM member that nominates the end use customer location(s) as a capacity resource and is fully responsible for the performance of the resource. Emergency DR (Load Management) products are required to respond to PJM Emergency Load Management events from noon through 8pm on non-holiday weekdays from June through September during PJM system emergencies or receive a penalty. PJM may declare Emergency Load Management events outside the required availability window but does not measure capacity compliance in such case (resources are eligible for emergency energy revenue if the reduce load). Emergency DR that is not dispatched during a system emergency must perform a mandatory test to demonstrate it can meet its capacity commitment or receive a penalty.

Figure 1 shows both the mandatory event and test performance values for the past 5 years. In the years where there was more than one event, the event performance is the event MW weighted average of all of the events. PJM emergency DR events outside the mandatory compliance period are excluded from the results. Overall performance across all the events in 2013 was good with load reductions that were 94% of their capacity commitment. Test performance was significantly better (129%) which is largely a function of the difference in the test requirement compared to what a resource must do when dispatched during an emergency.

Figure 1: Annual Performance Summary

Performance Summary		
Year	Event Performance	Test Performance
2009	No Events	118%
2010	100%	111%
2011	91%	107%
2012	104%	116%
2013	94%	129%

Figure 2 below summarizes capacity compliance performance as well as expected energy reductions reported by CSPs in advance of each event compared to actual energy settlements based on data available at time of this report. PJM dispatched Emergency DR 5 times during the mandatory compliance period and another 8 times over 6 days during the non-compliance period of the 2013/2014 Delivery Year as summarized in Figure 2 below. Overall event performance during the mandatory compliance period was good and ranged from 96% during the 9/11/13 event to 87% for the 9/10/13 event. Expected energy reductions were comparable to actual energy settlements for most days. PJM uses the expected energy reductions reported by CSPs as part of the dispatch decision making process when DR resources are required to maintain system reliability.¹

¹ Capacity compliance load reductions are primarily based the difference between the customers’ peak load contribution (“PLC”) and load during the event while energy load reductions are based on a customer base line approach.

Figure 2: 2013 Emergency DR (Load Management) Events Summary

Event Date and Zones	Committed Capacity (MW)	Capacity Reduction (MW)	Capacity Performance (MW)	Expected Avg. Energy Reduction (MW)***	Settled Avg Energy Reduction (MW)***
7/15/13, ATSI	690	657	95%	514	668
7/16/13, ATSI	690	626	91%	541	630
7/18/13, ATSI, PECO, PPL, AEP_CANTON**	1,791	1,624	91%	1,520	1,807
9/10/13, ATSI, AEP_CANTON**	798	694	87%	557	751
9/11/13, AECO*, AEP, ATSI, BGE*, DOM, DPL*, DUQ, JCPL*, METED, PECO*, PENELEC, PEPCO*, PPL*, PSEG*, RECO	6,048	5,782	96%	5,698	5,571
1/7/14, Morning, RTO				1,887	1,911
1/7/14, Afternoon, RTO				3,042	2,321
1/8/14, Morning, RTO				Cancelled	1,095
1/22/14, Afternoon, BGE, PEPCO				140	134
1/23/14, Morning, Mid-Atlantic, DOM, APS				633	622
1/23/14, Afternoon, Mid-Atlantic, DOM, APS				1,266	961
1/24/14, Morning, Mid-Atlantic, DOM, APS				706	595
3/4/14, Morning, RTO				1,592	1,777

Notes:

* Long and Short Lead (all others Long Lead only)

** AEP_Canton - capacity performance for voluntary event was 81% for 7/18/13 and 49% for 9/10/13 event.

*** Average hourly energy reduction does not include ramp hours. Expected Avg Energy Reductions are provided by CSPs in advance as required by PJM rules

The following are some key highlights from the very busy 2013/2014 Deliver Year to date:

- 1) 9/11/14 event was the largest DR deployment at PJM and potentially in any organized market in the world. Over 6,000 MWs of Emergency DR resources, across a large part of the PJM service territory were deployed to address the capacity shortage and actual performance was very good (96%). This represents over 1.1 million electricity customers reducing load as a wholesale market resource.
- 2) DR resources were deployed on 6 days during the non-mandatory season to date (January through early March). On many of the days DR resources were dispatched twice in one day to help manage the morning and afternoon peak. Many of the dispatches included resources across the entire RTO. DR resources are able to receive energy compensation during these time periods and are not assessed a capacity compliance event penalty.
- 3) ATSI zone was dispatched in all 5 mandatory summer events due to specific systems needs and associated transmission constraints. Performance of DR resources in ATSI declined moderately from first July event (95%) to 3rd July event (87%), which represented the 3rd event over a 4 day period. Emergency DR resources were deployed 9 times in ATSI zone during the 2013/24 Delivery Year to date.
- 4) AEP_Canton subzone was created and dispatched to meet specific capacity shortages due to transmission limits. Capacity compliance penalties for subzonal dispatched were not assessed based on market rules but will be assessed effective with 2014/2015 Delivery Year. Load reductions relative to nominated capacity commitments varied widely on the 2 event days from 49% to 81%.
- 5) The length of each dispatch over the delivery year tended to be longer than in prior Delivery Years. There was at least 1 dispatch in a zone, the lasted for the 6 hour maximum compliance period.



Overview

PJM Interconnection, L.L.C. procures capacity for its system reliability through the Reliability Pricing Model (RPM). The sources for meeting system reliability are divided into four groups:

- 1) Generation Capacity
- 2) Transmission Upgrades
- 3) Emergency Demand Resources (Load Management)
- 4) Energy Efficiency

For the 2013/2014 Delivery Year², there was only one Emergency DR product type available: Limited DR. Limited DR must be available to be interrupted up to ten times per Delivery Year by PJM. The interruptions may be up to six consecutive hours in duration on non-holiday weekdays from noon until 8 PM EPT in the months from June through September. The interruptions must be implemented within two hours of notification by PJM. Those resources that can be fully implemented within one hour of notification are considered Short Lead Time Resources, while those that require more than one hour but not more than two hours of notification are considered Long Lead Time Resources.

DR compliance can be more complex to measure than compliance for generation resources meeting their capacity obligations. In order to ensure the reliability service for which a Resource is paid has actually been provided, PJM utilizes three different types of measurement and verification methodologies. DR Resources can choose to be measured using:

- Direct Load Control (DLC) – Emergency DR (Load Management) for non-interval metered customers which is initiated directly by a Curtailment Service Provider's (CSP) market operations center, employing a communication signal to cycle HVAC or water heating equipment. This is traditionally done for residential consumers and requires the necessary statistical studies as outlined in PJM Manual 19 or other PJM approved measurement and verification methodology.
- Firm Service Level (FSL) – Emergency DR (Load Management) achieved by a customer reducing its load to a pre-determined level upon the notification from the CSP's market operations center. The customer must be able to reduce load below the pre-determined level which must be lower than the amount of capacity reserve for the customer as represented by the peak load contribution ("PLC").
- Guaranteed Load Drop (GLD) – Emergency DR (Load Management) achieved by a customer reducing its load below the PLC when compared to what the load would have been absent the PJM emergency or test.

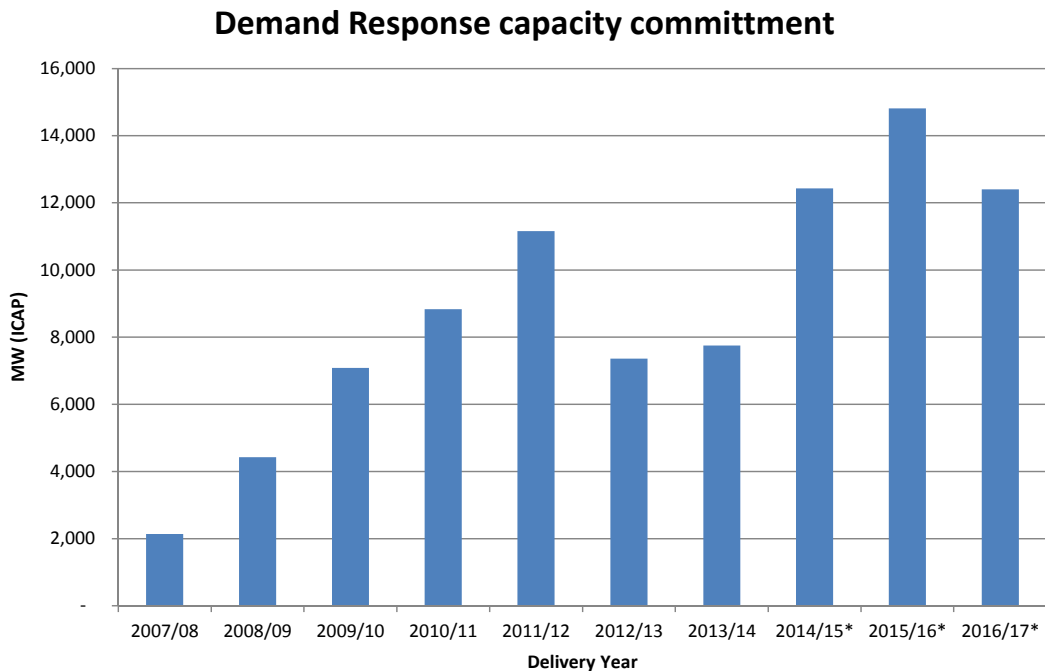
Participation Summary

² The Delivery Year for the capacity construct corresponds to PJM's Planning Year which runs each year from June 1 until May 31 of the following year

The capacity numbers in this report are in terms of either Installed Capacity (ICAP) or Unforced Capacity (UCAP) depending upon which is most relevant. PJM calculates the Resource amounts required to meet the reliability standard in terms of UCAP which is also utilized to measure compliance with a RPM commitment. PJM determines the UCAP value of different types of Resources based on methods described in the PJM manuals.

Emergency DR participation in the PJM capacity market significantly increased, then declined, and is expected to grow again over the next 3 Delivery Years based on the amount that has cleared in RPM auctions or provided as part of a LSEs FRR plan³. This trend is illustrated in Figure 3 below where ALM participation in the 2006/2007 Delivery Year was under 1,700 Megawatts (MW) while the DR participation peak is expected to be close to 15,000 MW in 2015/2016 DY based on existing capacity commitments. For the 2013/2014 Delivery Year, Emergency DR capacity commitments represented 7,753 MW of ICAP while total registered Emergency DR represented 8,967 MW. Registered Emergency DR may be in excess of the commitment if the CSP has indicated they have the potential to deliver an amount that is higher than their actual commitment⁴.

Figure 3: Emergency DR (Load Management) Participation History (ICAP)

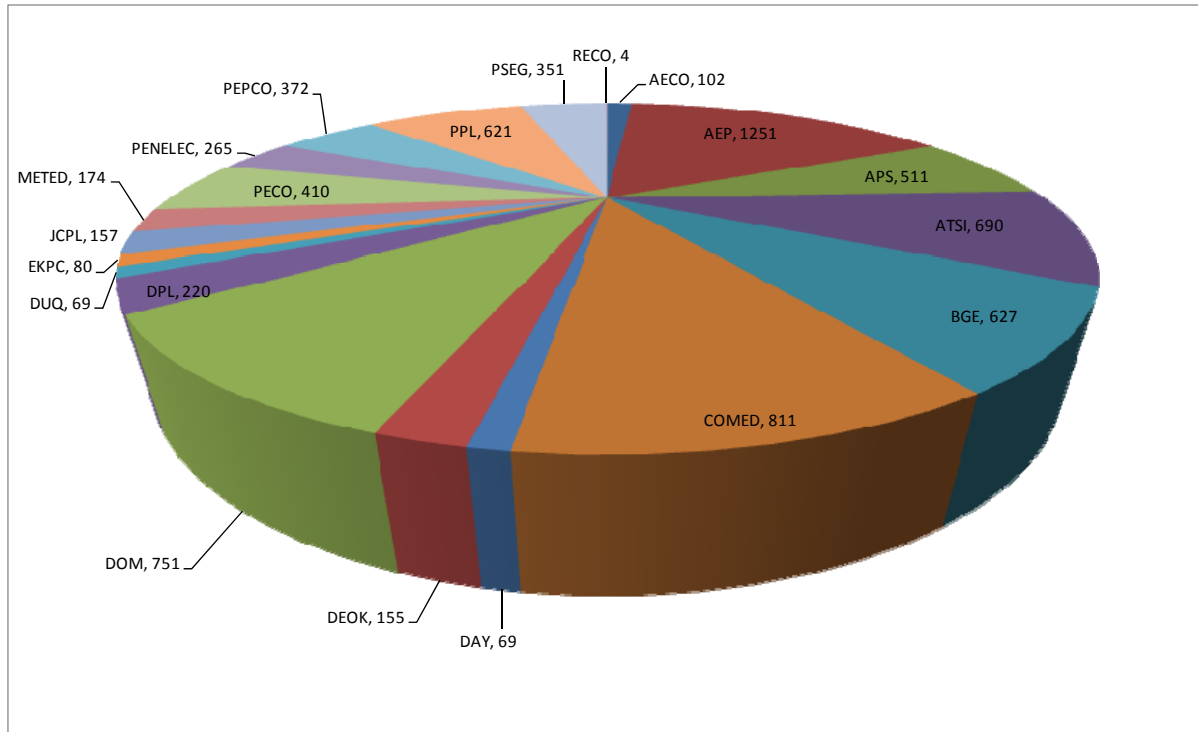


³ * Table represents DR capacity commitments (RPM & FRR) which have been adjusted for IA and/or replacement capacity transactions. 2014/15 numbers and forward are based on current commitments and may change.

⁴ For example, a CSP may clear 10 MW of resources in an RPM auction but register 11 MW load reduction capability by end use customers to fulfill such commitment.

Following is an illustration of how the registrations of Emergency DR Resources were spread across the 20 Zones for the 2013/2014 Delivery Year. Fifty One PJM members operate as a Curtailment Service Provider where over 1 million end use customers across almost every segment (residential, commercial, industrial, government, education, agricultural, etc.) participate as a Emergency DR (Load Management) resource

Figure 4: 2013/2014 Emergency DR Participation by Zone (MW ICAP)



Atlantic City Electric (AECO), American Electric Power (AEP), American Transmission Systems, Inc (ATSI), Allegheny Power (APS), Baltimore Gas and Electric (BGE), Commonwealth Edison (COMED), Dayton Power & Light (DAY), Dominion Virginia Power (DOM), Delmarva Power and Light (DPL), Duke Energy Ohio and Kentucky (DEOK), Duquesne Light (DUQ), East Kentucky Power Cooperative (EKPC), Jersey Central Power & Light (JCPL), Metropolitan Edison (METED), PECO (PECO), Pennsylvania Electric Company (PENELEC), Potomac Electric Power Co. (PEPCO), PPL Electric Utilities Corp. (PPL), Public Service Electric and Gas Co. (PSEG), Rockland Electric Company (RECO).

Figure 5 below illustrates the percentage of ICAP registered by the measurement and verification methods where close to 87 percent is Firm Service Level, 10 percent is residential direct load control type resources (do not have interval meters on all locations) and only 3 percent used Guaranteed Load Drop.

Figure 5: Percent of Committed ICAP

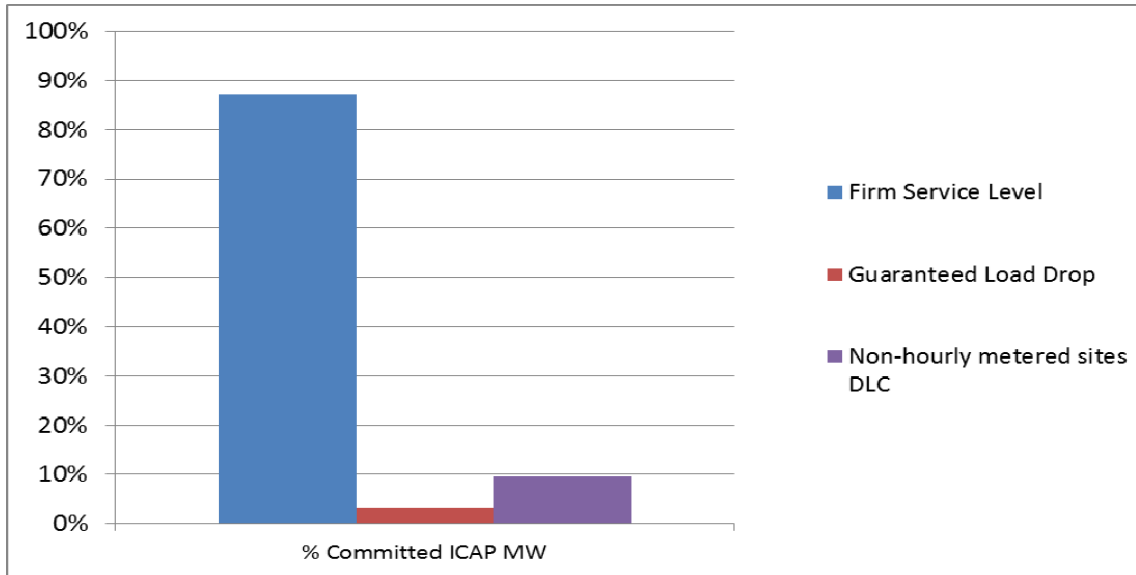
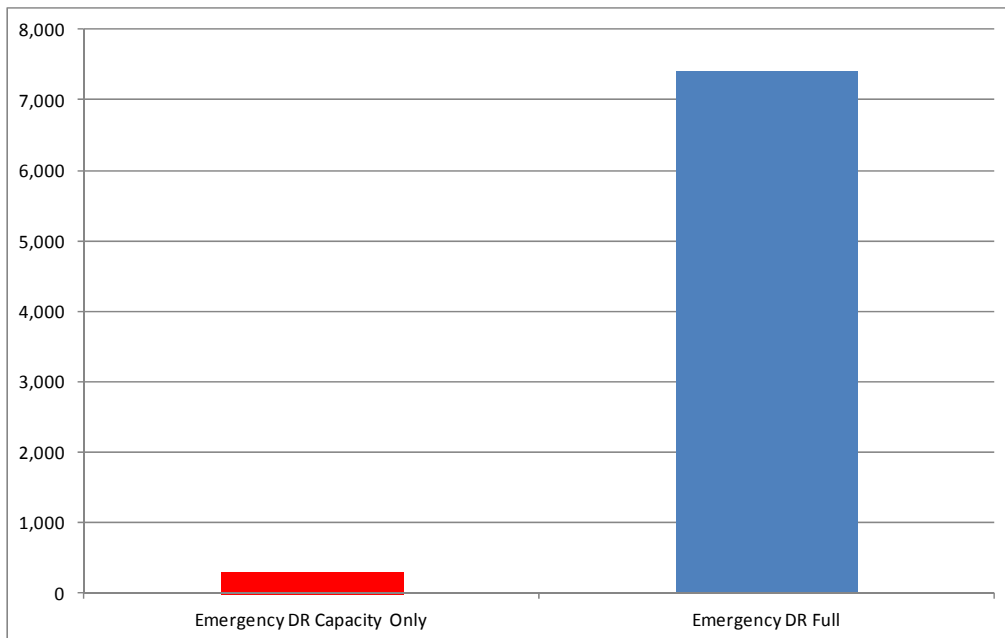


Figure 6 represents the current number of committed ICAP MWs for Emergency DR by registration type. Emergency Full resource receive both capacity revenue stream as well as an emergency energy revenue when there is an emergency DR (load management) event), compared to the number of MWs registered as Capacity Only (which indicates the CSP is not eligible for any emergency energy payments during an event). Approximately 2 percent of the total was registered as Capacity Only and this registration option is typically only used for some legacy EDC related tariff requirements or for registrations that participate with two different CSP.

Figure 6: MW of Committed ICAP as Full or Capacity Only





Aggregate event performance

Emergency DR is relied upon by PJM planning and PJM system operations to help maintain the safe and reliable operation of the PJM region. The 2013/14 Delivery Year has been the most frequently dispatched period on record at PJM. There were 5 mandatory compliance events during the summer and 8 non-mandatory events over 6 operating days to date in the non-summer season. Following is an overview of PJM Emergency DR (Load Management) events over the past 5 years.

Figure 7: Emergency DR (Load Management) Event History (5 year)

							Running Total:		
							# of Events		
Delivery Year	Year	Date	Step(s) Invoked	Time of Notification	Start Time	Time Released	Notes	Short Lead (1 hour)	Long Lead (2 hour)
2009/10	2010	May 26 (Wed)	2	15:15	17:15	19:59	DC portion of PEPCO zone only. Event occurred outside compliance period		1
2010/11	2010	Jun 11 (Fri)	2	13:58	15:58	20:12	DC portion of PEPCO zone only		1
2010/11	2010	Jul 7 (Wed)	2	11:37	13:37	19:07	DOM zone		1
			2	12:30	14:30	18:32	AE, BGE, DPL, JCPL, PECO, PS, RECO zones		1
			2	12:30	14:30	18:32	PEPCO zone		2
2010/11	2010	Aug 11 (Wed)	2	11:15	13:15	19:15	DC portion of PEPCO zone only		3
2010/11	2010	Sep 23 (Thu)	1	11:00	12:00	18:00	MD, VA and WV portions of APS zone only	1	
			2	11:00	13:00	19:00	MD, VA and WV portions of APS zone only		1
			2	12:30	14:30	20:00	BGE zone		2
2010/11	2010	Sep 24 (Fri)	2	10:30	12:30	18:30	BGE zone		3
							PEPCO zone		4
							MD, VA and WV portions of APS zone only		2
							Norfolk portion of DOM zone only. Event occurred outside compliance period		2
2010/11	2011	May 26 (Thu)	2	14:20	16:20	18:20	Norfolk portion of DOM zone only. Event occurred outside compliance period		
2010/11	2011	May 31 (Tue)	2	15:05	17:05	19:05	Event occurred outside compliance period.		
							METED, PENLC, PL, RECO zones		1
							AE, DPL, JCPL, PECO, PS zones		2
							DOM zone		3
							BGE zone		4
							PEPCO zone		5
2011/12	2011	Jul 22 (Fri)	2	10:00	12:00	18:00	BGE zone		1
			1	11:00	12:00	17:30	BGE zone	1	
			2	11:30	13:30	18:30	JCPL, METED zones		1
			2	11:30	13:30	19:00	PECO zone		1
			2	11:30	13:30	19:30	DPL, DLCO zones		1
2012/13	2012	Jul 17 (Tue)	2	13:08	15:08	19:05	AEP, DOM zones		1
2012/13	2012	Jul 18 (Wed)	2	13:22	15:22	17:23	BGE, JCPL, PECO, PENLC, PEPCO zones		1
			2	13:38	15:38	17:29	DPL zone		1
			1	14:28	15:28	17:34	AE, BGE, DPL, JCPL, METED, PECO, PENLC, PEPCO, PL, PS, RECO zones	1	



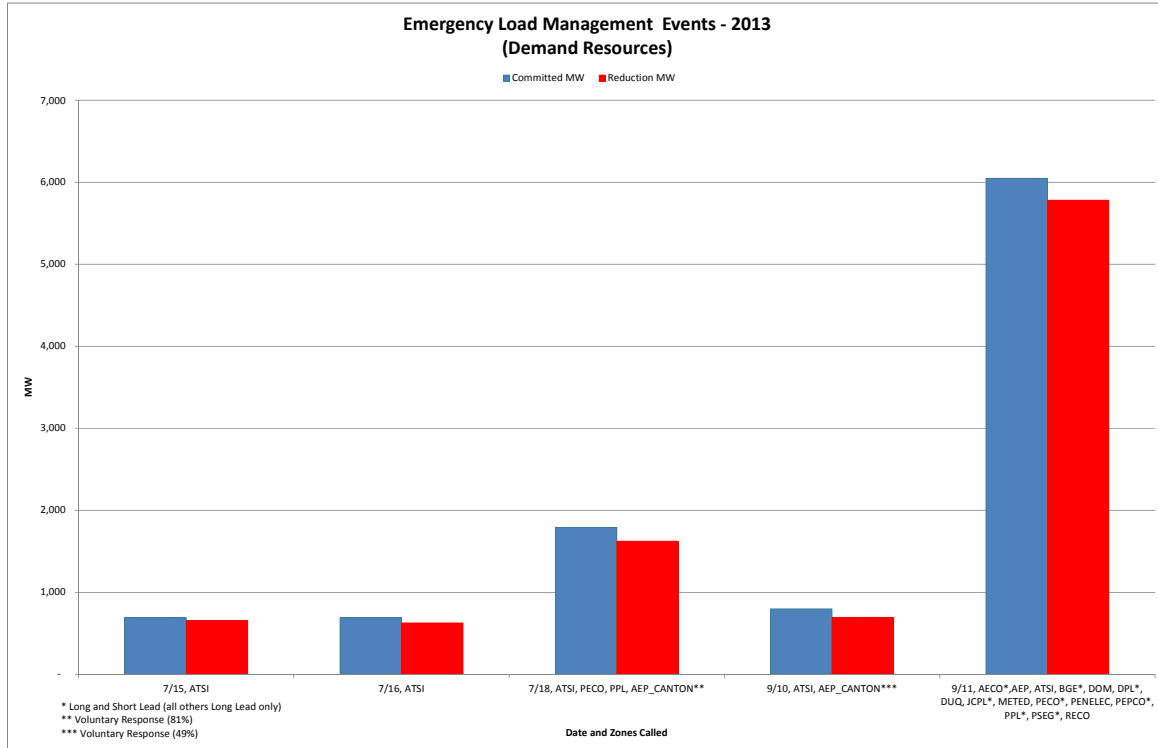
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							Running Total:		
							# of Events		
Delivery Year	Year	Date	Step(s) Invoked	Time of Notification	Start Time	Time Released	Notes	Short Lead (1 hour)	Long Lead (2 hour)
2013/14	2013	Jul 15 (Mon)	2	13:50	15:50	18:22	ATSI zone		1
2013/14	2013	Jul 16 (Tue)	2	11:30	13:30	16:30	ATSI zone		2
2013/14	2013	Jul 18 (Thu)	2	12:40	14:40	18:00	ATSI zone		3
			2	12:40	14:40	17:00	PECO, PL zones		1
			2	13:00	15:00	18:00	Canton portion of AEP zone only		1
2013/14	2013	Sep 10 (Tue)	2	13:50	15:50	21:30	ATSI zone		4
			2	14:45	16:45	21:30	Canton portion of AEP zone only		2
2013/14	2013	Sep 11 (Wed)	2	11:30	13:30	19:30	AEP zone Note: 3rd event for Canton portion of AEP zone		1
			2	12:00	14:00	20:00	ATSI zone		5
			2	12:30	14:30	18:30	DOM zone		1
			2	13:00	15:00	17:00	AE, JCPL, PS, RECO zones		1
			2	13:00	15:00	17:30	METED zone		1
			2	13:00	15:00	17:30	PECO, PL zones		2
			2	13:00	15:00	18:00	BGE, DPL, PEPCO zones		1
			2	13:00	15:00	18:30	PENLC zone		1
			1	13:00	14:00	17:15	AE, BGE, DPL, JCPL, METED, PECO, PENLC, PEPCO, PL, PS, RECO zones	1	
			2	13:00	15:00	18:30	DLCO zone		1
2013/14	2014	Jan 6 (Mon)					5% voltage reduction: 19:52 - 20:45		
2013/14	2014	Jan 7 (Tue)	1	4:30	5:30	11:00	AEP, APS, ATSI, COMED, DAYTON, DEOK, DLCO, DOM, EKPC zones	1	
			1	4:30	5:30	11:00	AE, BGE, DPL, JCPL, METED, PECO, PENLC, PEPCO, PL, PS, RECO zones	2	
			2	4:30	6:30	11:00	APS, COMED, DAYTON, DEOK, EKPC zones		1
			2	4:30	6:30	11:00	AEP zone Note: 4th event for Canton portion of AEP zone		2
			2	4:30	6:30	11:00	AE, BGE, DPL, DLCO, DOM, JCPL, METED, PENLC, PEPCO, PS, RECO zones		2
			2	4:30	6:30	11:00	PECO, PL zones		3
			2	4:30	6:30	11:00	ATSI zone		6
							Event occurred outside compliance period.		
2013/14	2014	Jan 7 (Tue)	1	15:00	16:00	18:15	AEP, APS, ATSI, COMED, DAYTON, DEOK, DLCO, DOM, EKPC zones	2	
			1	15:00	16:00	18:15	AE, BGE, DPL, JCPL, METED, PECO, PENLC, PEPCO, PL, PS, RECO zones	3	
			2	15:00	17:00	18:15	APS, COMED, DAYTON, DEOK, EKPC zones		2
			2	15:00	17:00	18:15	AEP zone Note: 5th event for Canton portion of AEP zone		3
			2	15:00	17:00	18:15	AE, BGE, DPL, DLCO, DOM, JCPL, METED, PENLC, PEPCO, PS, RECO zones		3
			2	15:00	17:00	18:15	PECO, PL zones		4
			2	15:00	17:00	18:15	ATSI zone		7
							Event occurred outside compliance period.		
2013/14	2014	Jan 8 (Wed)	1	5:00	6:00	7:00	AEP, APS, ATSI, COMED, DAYTON, DEOK, DLCO, DOM, EKPC zones	3	
			1	5:00	6:00	7:00	AE, BGE, DPL, JCPL, METED, PECO, PENLC, PEPCO, PL, PS, RECO zones	4	
			2	5:00	7:00	7:00	APS, COMED, DAYTON, DEOK, EKPC zones		3
			2	5:00	7:00	7:00	AEP zone Note: 6th event for Canton portion of AEP zone		4
			2	5:00	7:00	7:00	AE, BGE, DPL, DLCO, DOM, JCPL, METED, PENLC, PEPCO, PS, RECO zones		4
			2	5:00	7:00	7:00	PECO, PL zones		5
			2	5:00	7:00	7:00	ATSI zone		8
							Event occurred outside compliance period.		
2013/14	2014	Jan 22 (Wed)	1	14:00	15:00	21:00	BGE, PEPCO zones	5	
			2	14:00	15:00	21:00	BGE, PEPCO zones		5
							Event occurred outside compliance period.		
2013/14	2014	Jan 23 (Thu)	1	4:30	5:30	8:30	APS, DOM zones	4	
			1	4:30	5:30	8:30	AE, DPL, JCPL, METED, PECO, PENLC, PL, PS, RECO zones	5	
			1	4:30	5:30	8:30	BGE, PEPCO zones	6	
			2	4:30	6:30	8:30	APS zone		4
			2	4:30	6:30	8:30	AE, DPL, DOM, JCPL, METED, PENLC, PS, RECO zones		5
			2	4:30	6:30	8:30	BGE, PEPCO, PEPCO, PL zones		6
							Event occurred outside compliance period.		
2013/14	2014	Jan 23 (Thu)	1	14:00	15:00	19:00	APS, DOM zones	5	
			1	14:00	15:00	19:00	AE, DPL, JCPL, METED, PECO, PENLC, PL, PS, RECO zones	6	
			1	14:00	15:00	19:00	BGE, PEPCO zones	7	
			2	14:00	16:00	19:00	APS zone		5
			2	14:00	16:00	19:00	AE, DPL, DOM, JCPL, METED, PENLC, PS, RECO zones		6
			2	14:00	16:00	19:00	BGE, PEPCO, PEPCO, PL zones		7
							Event occurred outside compliance period.		
2013/14	2014	Jan 24 (Fri)	1	4:30	5:30	8:45	APS, DOM zones	6	
			1	4:30	5:30	8:45	AE, DPL, JCPL, METED, PECO, PENLC, PL, PS, RECO zones	7	
			1	4:30	5:30	8:45	BGE, PEPCO zones	8	
			2	4:30	6:30	8:45	APS zone		6
			2	4:30	6:30	8:45	AE, DPL, DOM, JCPL, METED, PENLC, PS, RECO zones		7
			2	4:30	6:30	8:45	BGE, PEPCO, PEPCO, PL zones		8
							Event occurred outside compliance period.		
2013/14	2014	Mar 4 (Tue)	1	4:30	5:30	8:30	AEP, ATSI, COMED, DAYTON, DEOK, DLCO, EKPC zones	4	
			1	4:30	5:30	8:30	APS, DOM zones	7	
			1	4:30	5:30	8:30	AE, DPL, JCPL, METED, PECO, PENLC, PL, PS, RECO zones	8	
			1	4:30	5:30	8:30	BGE, PEPCO zones	9	
			2	4:30	6:30	8:30	COMED, DAYTON, DEOK, EKPC zones		4
			2	4:30	6:30	8:30	AEP, DLCO zones Note: 7th event for Canton portion of AEP zone		5
			2	4:30	6:30	8:30	APS zone		7
			2	4:30	6:30	8:30	AE, DPL, DOM, JCPL, METED, PENLC, PS, RECO zones		8
			2	4:30	6:30	8:30	ATSI, BGE, PEPCO, PEPCO, PL zones		9
							Event occurred outside compliance period.		

Step 1 = Short Lead Time (1 hour)
Step 2 = Long Lead Time (2 hour)

PJM dispatches Emergency DR (Load Management) events by zone (or sub-zone) and by lead time. This allows PJM to address system conditions in a targeted, measured and phased manner. Overall performance of DR resources was good and ranged from 87% on 9/10/13 to 96% on 9/11/13. Figure 8 below depicts the overall performance for each of the 2013 Emergency DR (Load Management) events that occurred during the compliance period:

Figure 8: 2013 Emergency DR (Load Management) Events



Figures 9 through 13 below show the hourly performance values for each event. The hourly performance is very similar to overall event performance, except that in some cases the performance was lower during the later hours. For example, on September 11th the performance from 5pm through 8pm was less than performance from 3 to 5pm.

Figure 9: July 15, 2013 Hourly Performance

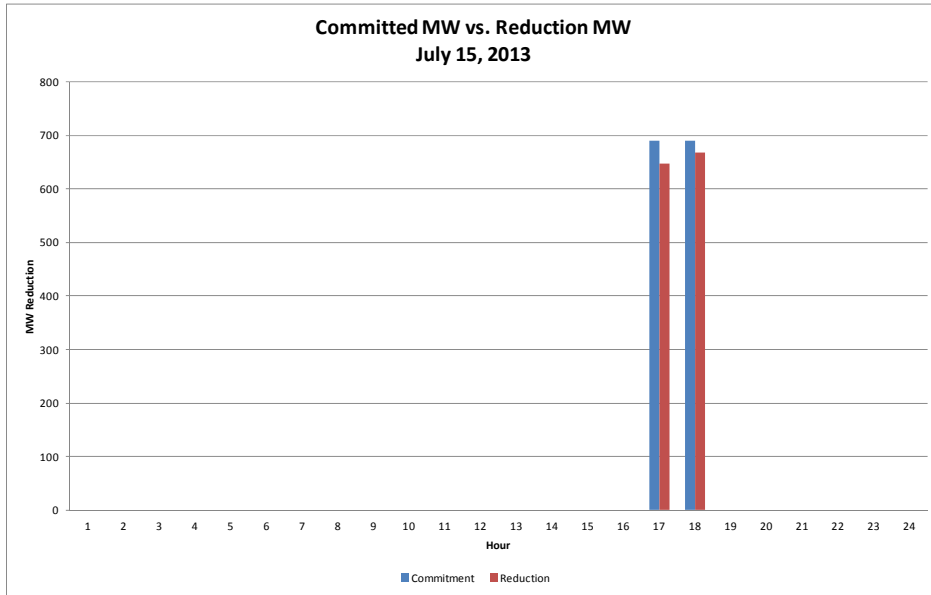


Figure 10: July 16, 2013 Hourly Performance

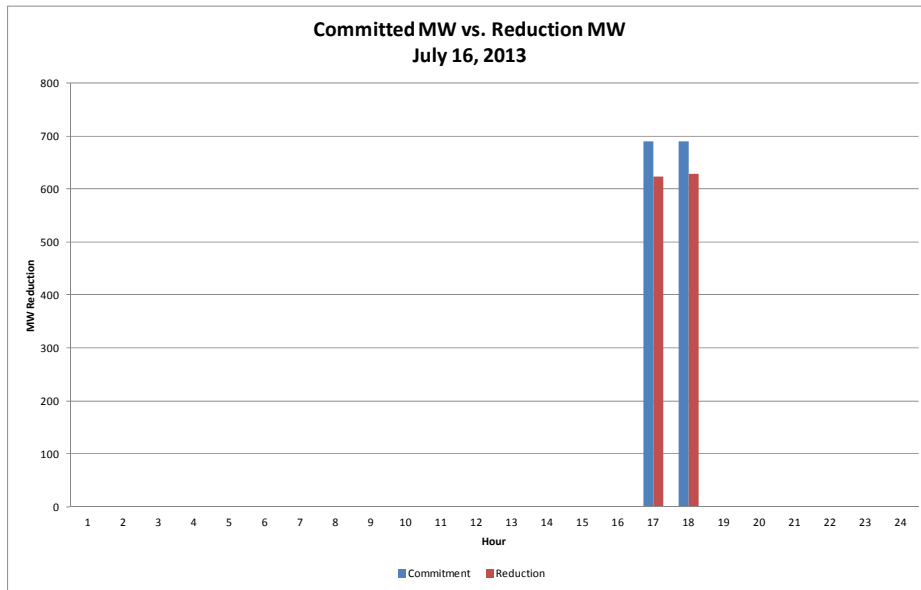


Figure 11: July 18, 2013 Hourly Performance

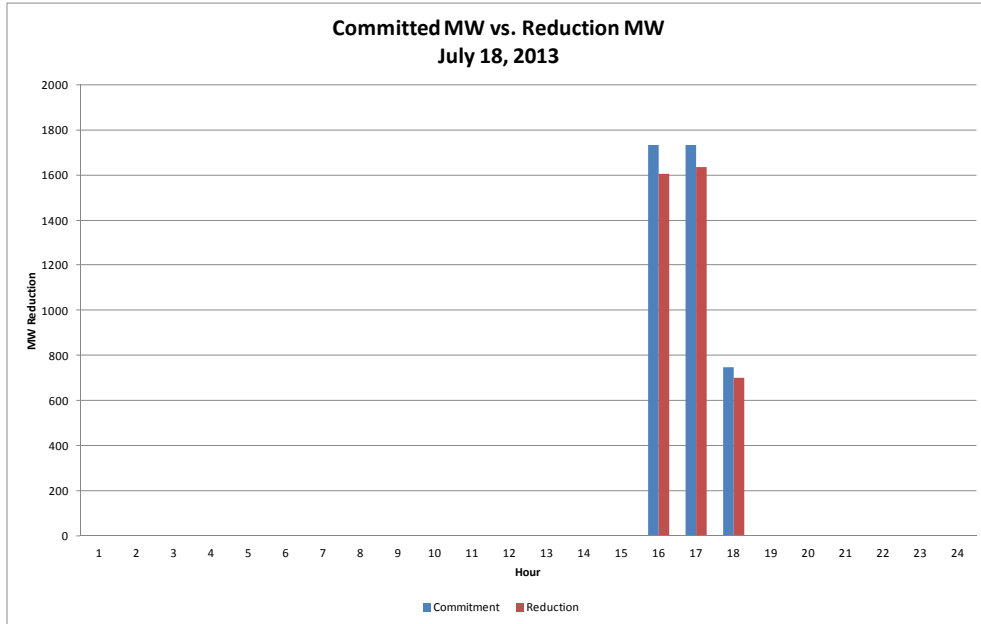


Figure 12: September 10, 2013 Hourly Performance

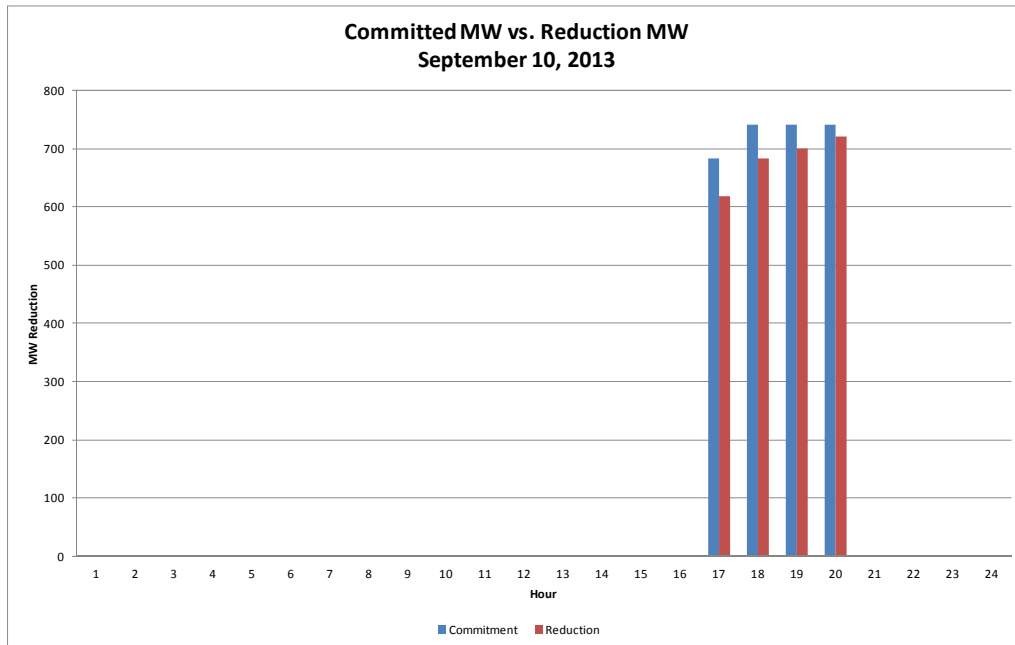
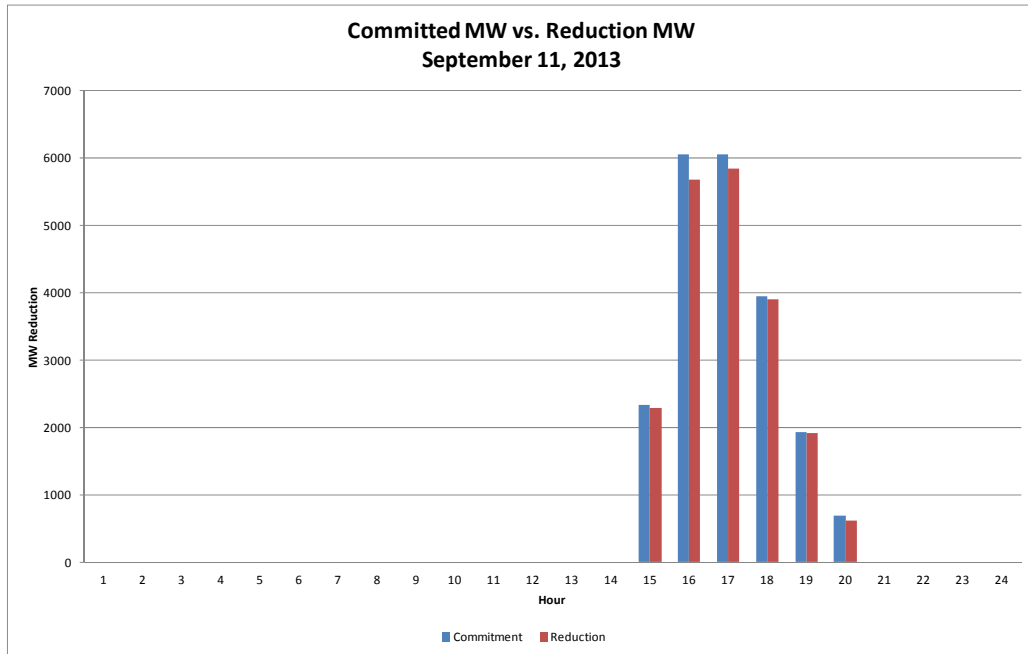


Figure 13: September 11, 2013 Hourly Performance



Event performance measurement can also be broken down by the specific zone(s) and lead time(s) dispatched by PJM. Performance for those Emergency DR (Load Management) events, by zone and lead time, is depicted in Figure 14 below. Zonal mandatory performance by lead time, where PJM dispatched at least 5 MW, varied widely where performance was a low of 77% in the PECO zone for 9/11/13 event and a high of 156% in DPL zone for the same event.

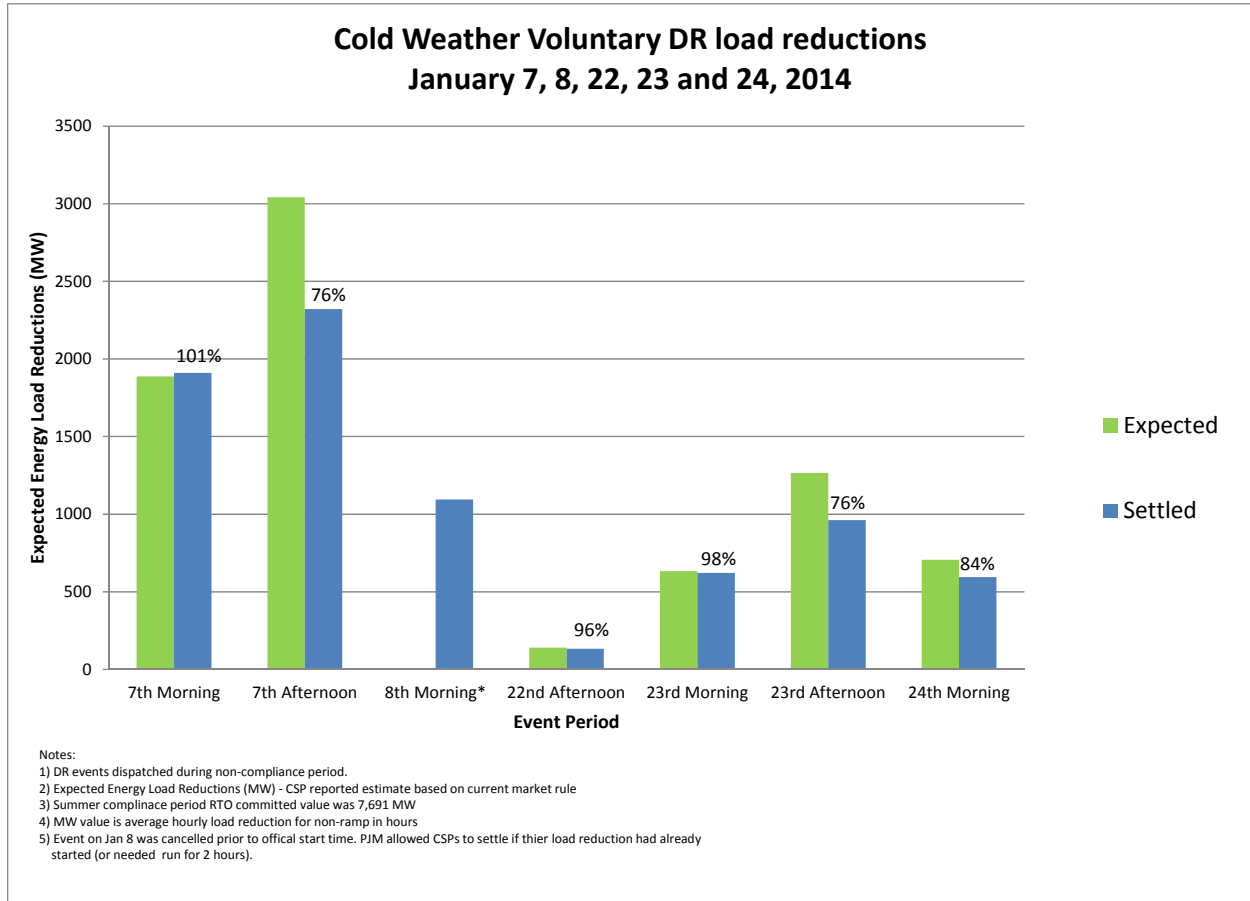
Figure 14: 2013 Emergency DR (Load Management) Event Performance by Zone

EventDate	Committed MW	Reduction MW	Performance MW	Performance Percentage	Zone	Lead Time
7/15/2013	690	657	-33	95%	ATSI	Long
7/16/2013	690	626	-64	91%	ATSI	Long
7/18/2013	690	599	-91	87%	ATSI	Long
7/18/2013	409	366	-43	89%	PECO	Long
7/18/2013	579	565	-14	98%	PPL	Long
7/18/2013	115	93	-22	81%	AEP_CANTON*	Long
9/10/2013	683	638	-45	93%	ATSI	Long
9/10/2013	115	56	-59	49%	AEP_CANTON*	Long
9/11/2013	51	48	-2	95%	AECO	Long
9/11/2013	42	42	0	100%	AECO	Short
9/11/2013	1252	1299	47	104%	AEP	Long
9/11/2013	683	596	-87	87%	ATSI	Long
9/11/2013	566	612	46	108%	BGE	Long
9/11/2013	62	72	11	118%	BGE	Short
9/11/2013	757	678	-79	90%	DOM	Long
9/11/2013	154	140	-15	91%	DPL	Long
9/11/2013	66	103	37	156%	DPL	Short
9/11/2013	69	56	-14	80%	DUQ	Long
9/11/2013	137	119	-18	87%	JCPL	Long
9/11/2013	20	25	5	126%	JCPL	Short
9/11/2013	174	179	5	103%	METED	Long
9/11/2013	409	314	-94	77%	PECO	Long
9/11/2013	0.2	0.1	-0.1	61%	PECO	Short
9/11/2013	265	257	-8	97%	PENELEC	Long
9/11/2013	200	210	10	105%	PEPCO	Long
9/11/2013	168	144	-24	86%	PEPCO	Short
9/11/2013	579	534	-44	92%	PPL	Long
9/11/2013	43	64	21	150%	PPL	Short
9/11/2013	346	281	-65	81%	PSEG	Long
9/11/2013	4	5	1	111%	PSEG	Short
9/11/2013	4	5	1	118%	RECO	Long

Figure 15 below illustrates Load Management performance during the non-mandatory period which occurred during the winter. During the non-mandatory period, capacity compliance is not measured because Limited DR is not required to be available but are eligible to receive energy payments if they can reduce load. CSP report expected hourly energy reduction in advance of each operating day/hour during the Delivery Year as an input to the PJM dispatch process. The chart below compares the difference between the CSP expected load reductions and the

actual load reductions settled for each of the non-mandatory events. The actual energy load were relatively close the the expected values and ranged from 76% to 101%.

Figure 15: 2013/2014 Emergency DR (Load Management) Event Performance for Non-mandatory period



CSP Event Performance

CSP performance is measured for each event by zone for all resources that were dispatched by PJM. The DR reductions made in a zone are compared to each CSP's capacity reduction commitment. Under performance is penalized and over performance may be rewarded (within limits and to the extent that there were underperformance penalties paid, see Event Performance Penalties). Figures 16 through 20 below depict the performance of all CSP/zone combinations over each of the summer 2013/2014 DY Emergency DR (Load Management) events. Some CSP/zone combinations may represent a very small MW commitment while other may represent a large MW commitment. The intention of this chart is to provide an indication of the distribution of CSP/zone performance for each event. The y axis represents the number of CSP/zone combinations that received a performance score in a specific performance score range. Only the 7/18 and 9/11 events represent normally distributed performance across CSPs while the 7/15 event shows a significant amount of very low performance (<40%) and very high performance (>160%). The 9/10 events is skewed toward underperformance and is probably a function of a smaller event with less CSPs and zones when compared to a larger event such as 9/11. For example, the September 11th event (over 6,000 MW across most of the RT), 45% of CSPs zonal performance was within the 81 percent to 120 percent range while 84% percent fell into the wider range between 41 percent and 160 percent.

Figure 16: CSP Zonal Performance 7/15 Event

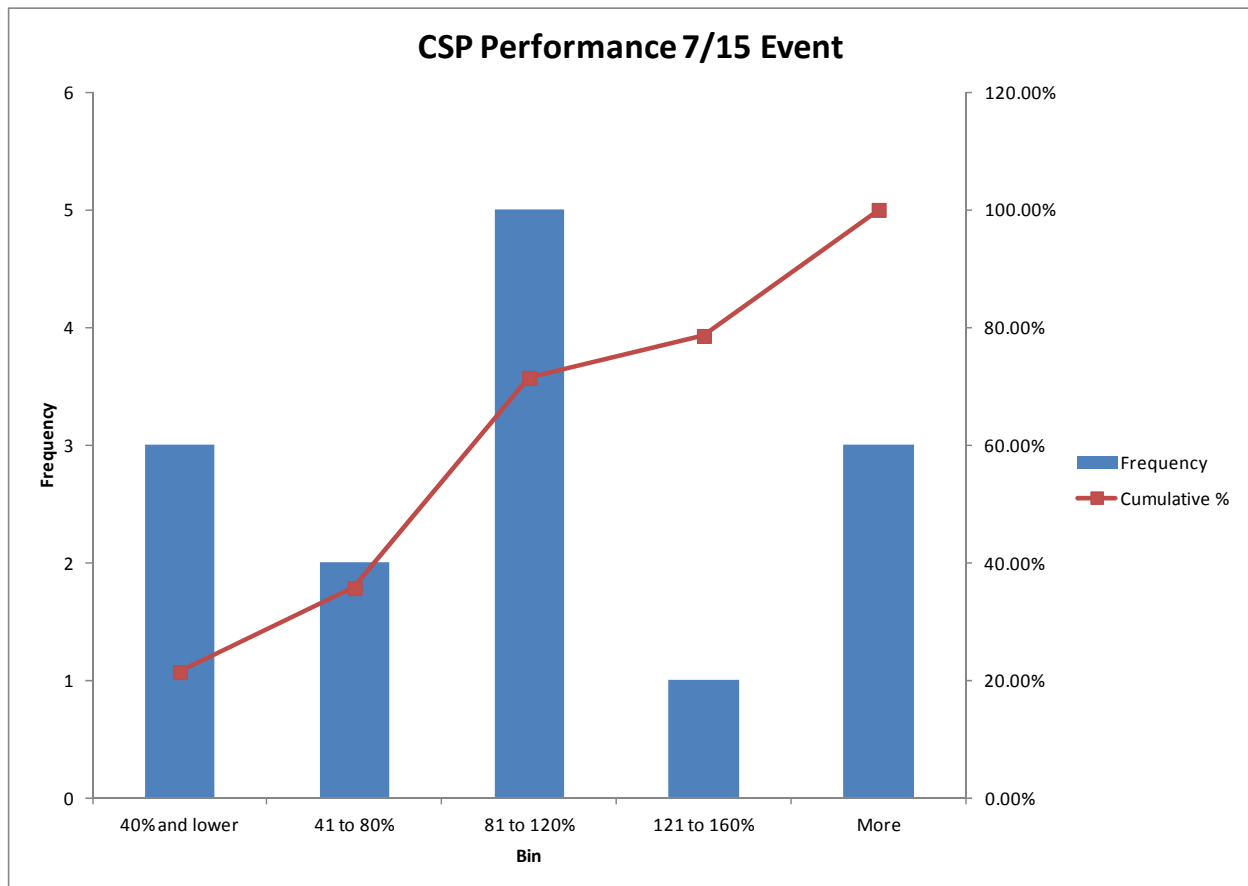


Figure 17: CSP Zonal Performance 7/16 Event

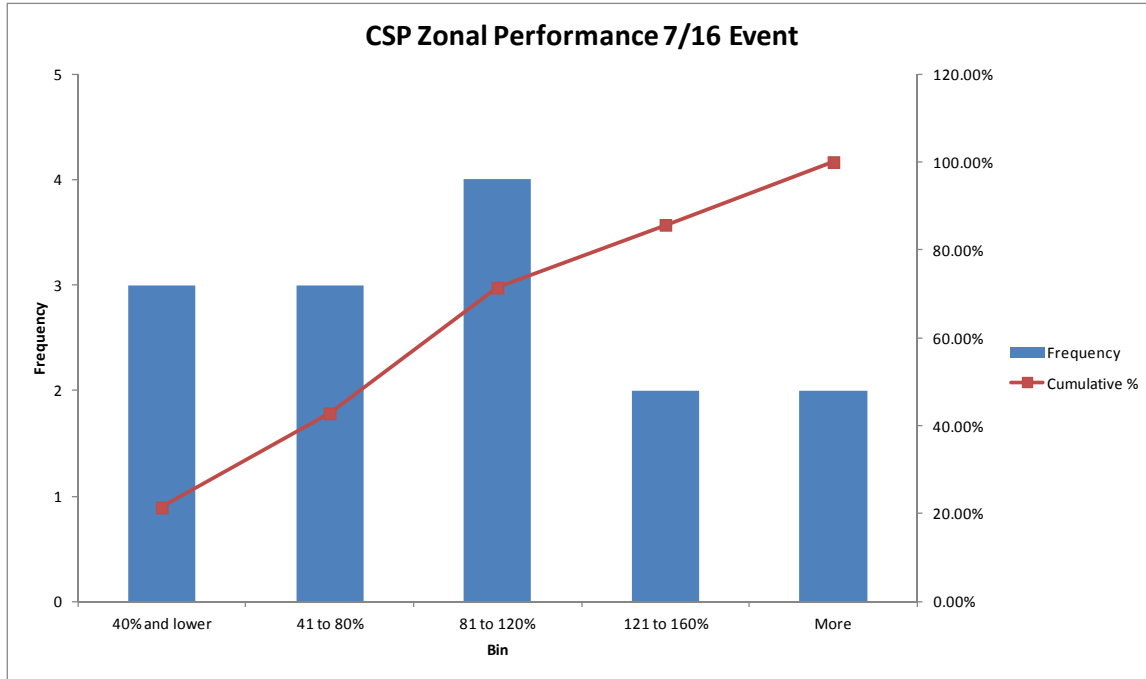


Figure 18: CSP Zonal Performance 7/18 Event

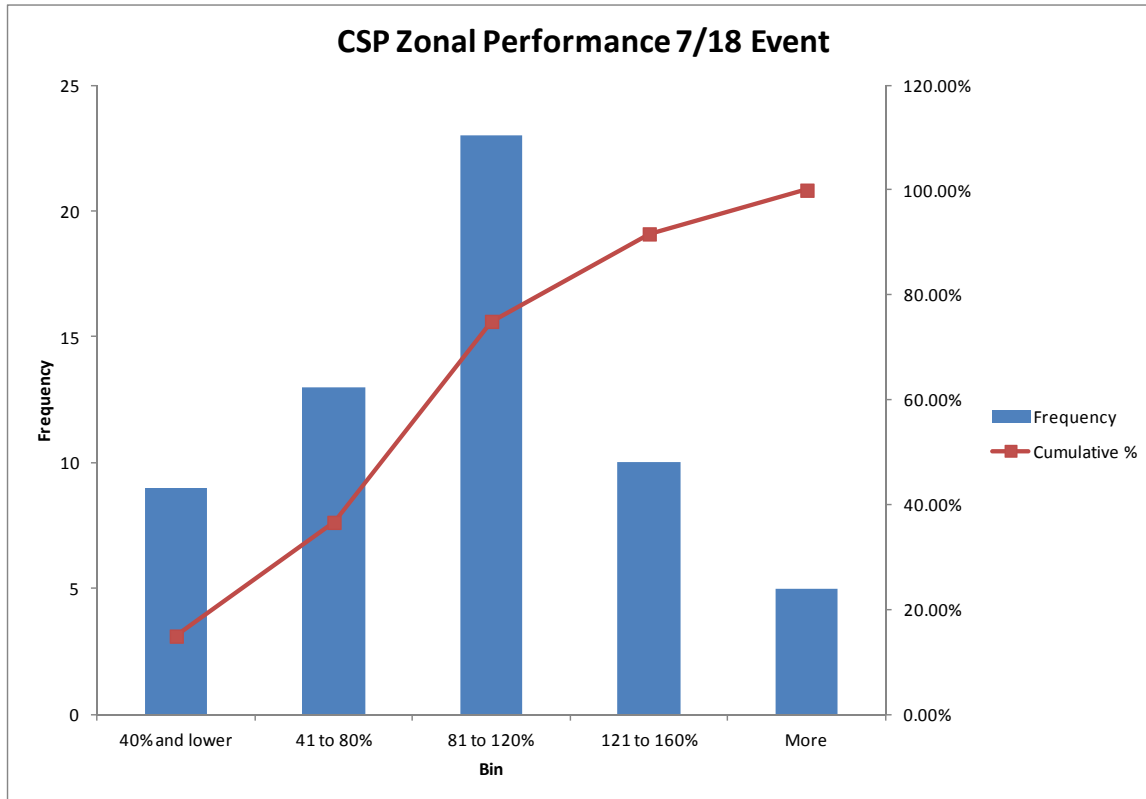


Figure 19: CSP Zonal Performance 9/10 Event

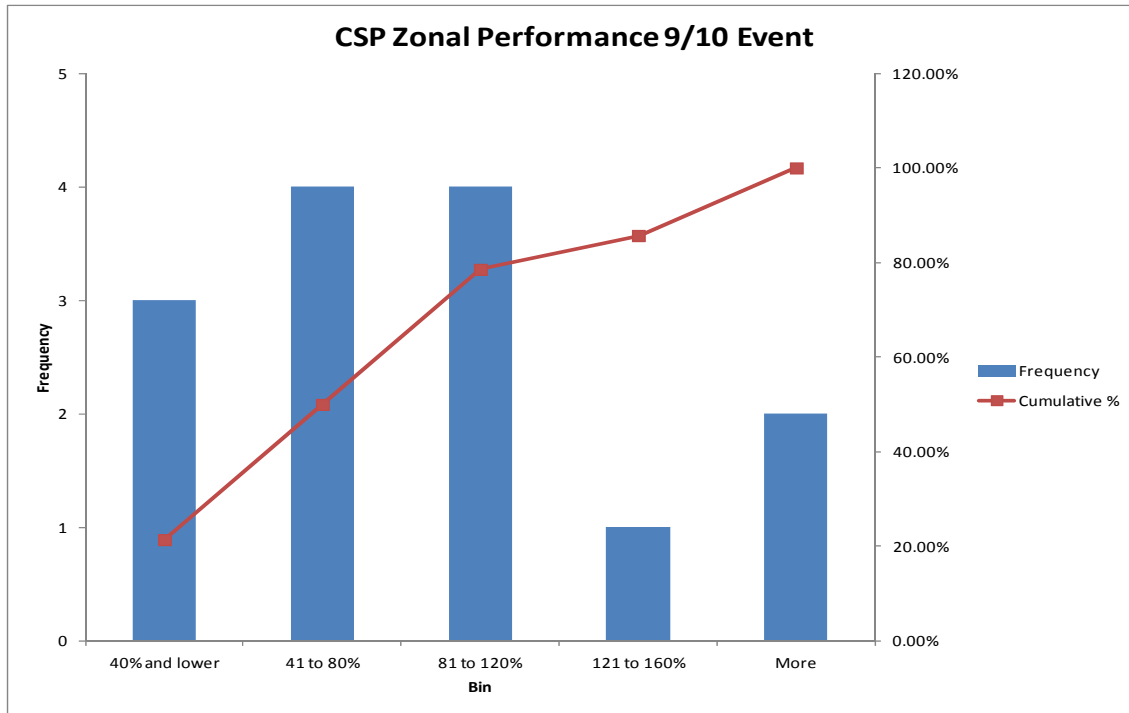
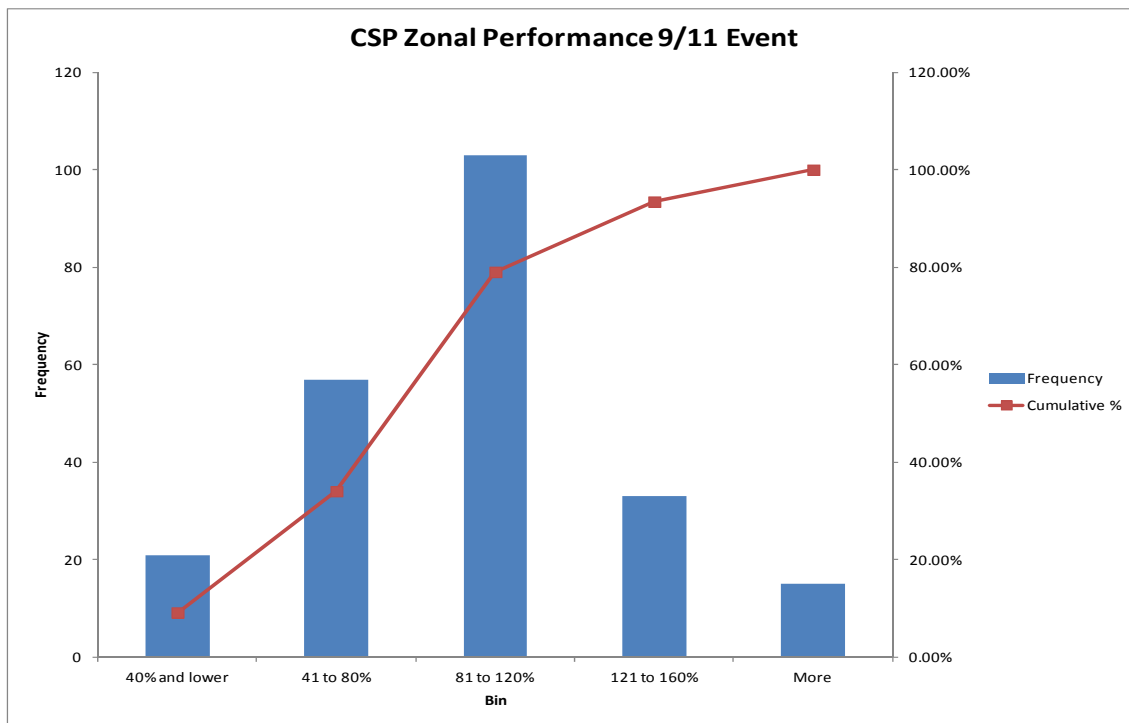


Figure 20: CSP Zonal Performance 9/11 Event



When comparing the distribution of CSP zonal event performance in 2013 with that of 2012, performance has degraded. The number of CSP zonal event performance occurrences in the mid range (81 – 120%) fell while the

number in the lower range (41 – 80%) increased. Figure 21 below depicts the performance of all CSP/zone combinations over all of both the 2012 and 2013 Emergency DR (Load Management) events. It should be noted that there were significantly more events and MWs dispatched in 2013 than in 2012.

Figure 21: CSP Zonal Performance 2012 vs. 2013

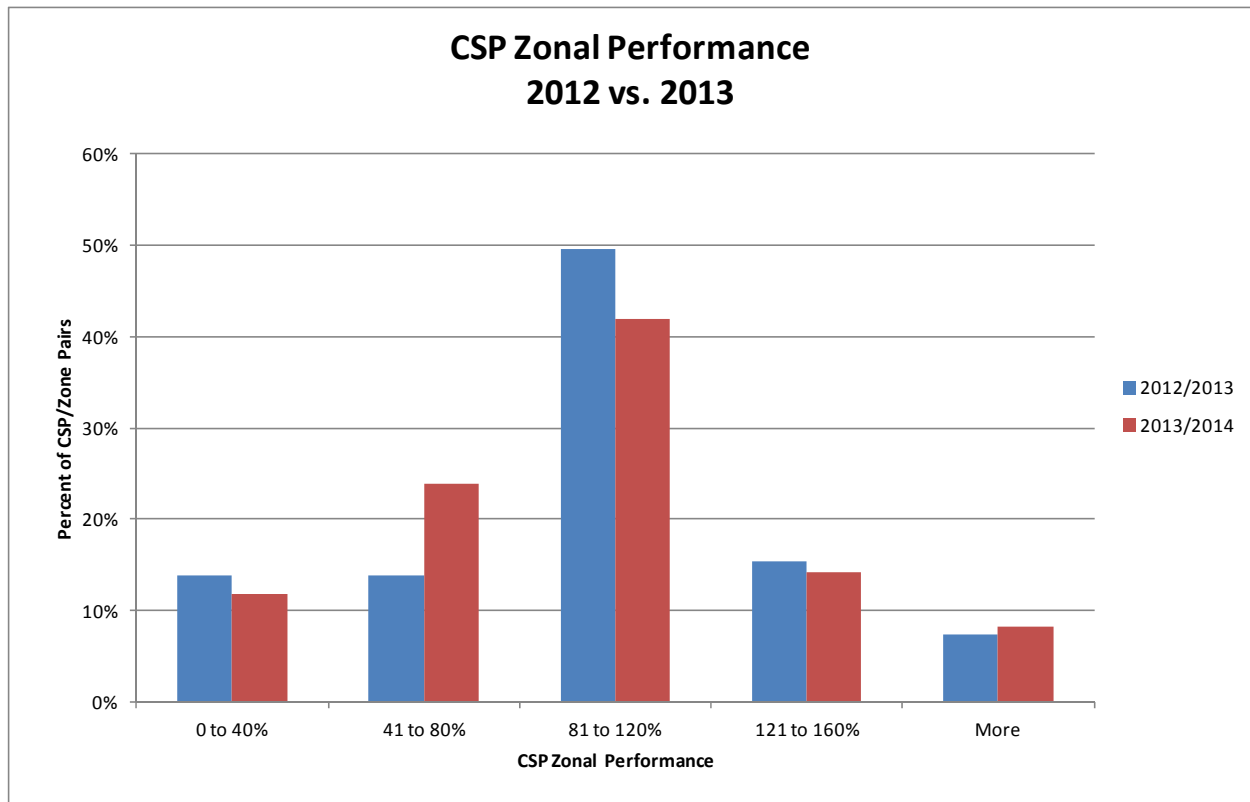
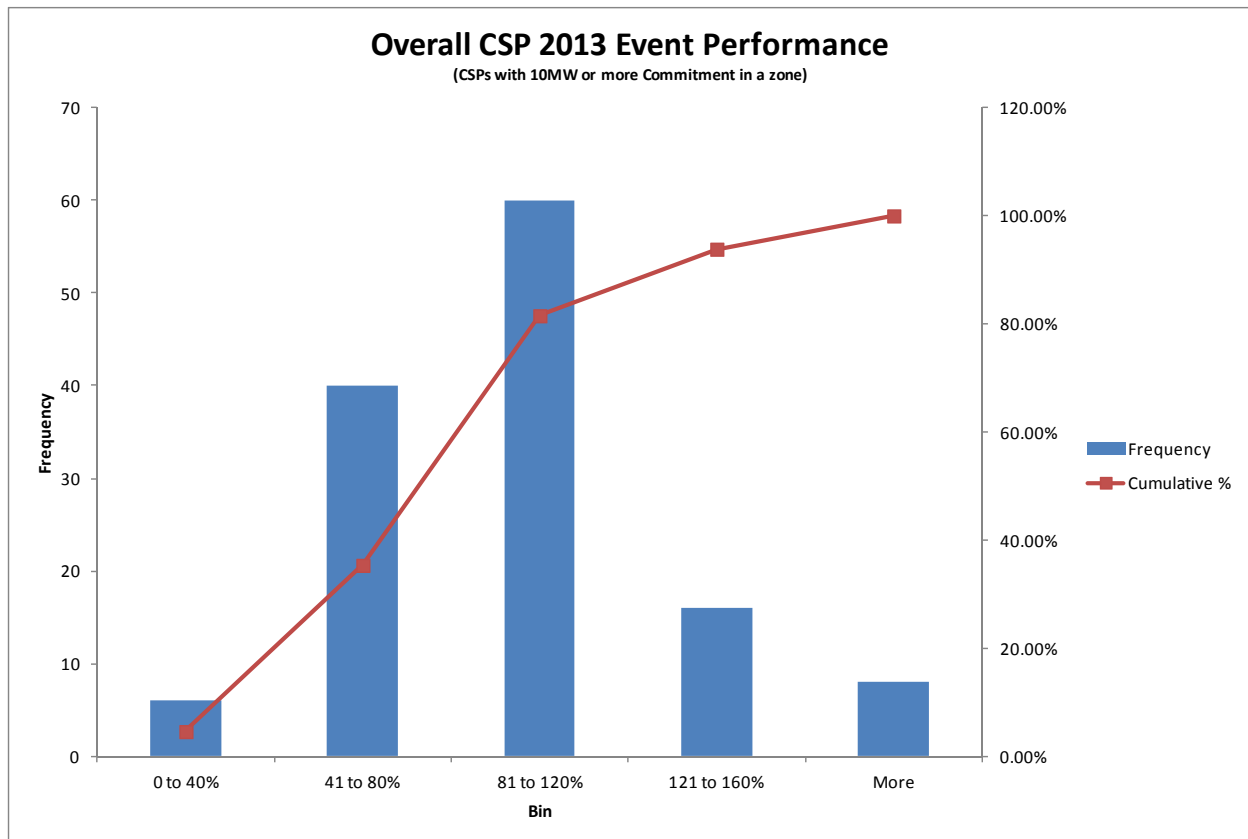


Figure 22 below represents the distribution of CSP zonal performance for large zonal portfolios (those greater than 10MW) across all 2013 events. There were 24 CSPs with commitments of at least 10MWs in a zone for an event. For purposes of the analysis these are considered large CSPs. The previous three charts included the performance of all CSPs, including portfolios that were less than 10 MW. Removing the small portfolios from the analysis provides a look at performance of members providing most of the load reductions. The frequency distribution of this group is skewed toward underperformance where there are a significant number of portfolios that only performed between 41 and 80%. This implies that many of the CSPs had similar issues with performance and that underperformance was not dominated by a small handful of CSPs.

Figure 22: Overall Large CSP Event Performance



Event Performance Penalties

Emergency DR (Load Management) Event Penalties are assessed by CSP and zone and then disbursed to CSPs that over-perform and where necessary to LSEs. However, to preserve confidentiality, the results are reported on an aggregated basis. Emergency DR (Load Management) Event Penalties and Credits are currently billed as an annual lump sum. Figure 23 summarizes the annual charges and credits by Event. The total amount of Emergency DR (Load Management) Event Penalties assessed for the 2013 events is \$24.9 million/year (\$2 million last year). To put this value into context it is important to note that total CSP revenues for DR are approximately \$558.7 million per year (\$267.5 million last year). The penalty charges are about 4.5 percent of the total revenue (0.7 percent last year). The Emergency DR (Load Management) Event Charges collected from CSPs are first allocated on a pro-rata basis to those CSPs that provided load reductions in excess of the amount obligated. Any Emergency DR (Load Management) Event Charges not allocated to over-performing CSPs are further allocated to all LSEs in the RTO pro-rata based on Load Contribution.

Figure 23: Emergency DR (Load Management) Event Penalties and Credits

	Annual Penalties	Annual Credits to Over-Performers	Annual Credits to LSEs
July 15, 2013 LM Event	\$ 215,401.10	\$ 91,049.25	\$ 124,326.30
July 16, 2013 LM Event	\$ 265,774.75	\$ 84,015.70	\$ 181,744.45
July 18, 2013 LM Event	\$ 5,032,211.20	\$ 864,356.50	\$ 4,167,880.25
Sept. 10, 2013 LM Event	\$ 310,173.35	\$ 154,515.45	\$ 155,636.00
Sept. 11, 2013 LM Event	\$ 19,048,203.90	\$ 4,331,327.25	\$ 14,716,821.90
Total	\$ 24,871,764.30	\$ 5,525,264.15	\$ 19,346,408.90

Emergency Energy Settlements

For Emergency DR events, Full Emergency type registrations are entitled to submit settlements for the energy reductions provided. The compensation is based on each registration's offer price, shutdown cost and the LMPs during the event. Figure 24 shows the settlement values for each of the 2013 Emergency DR (Load Management) Events. September 11th and January 7th, where either the entire RTO or majority of RTO were dispatched, represented over \$53 million of the \$86.5 million settled for emergency energy from DR.

Figure 24: Emergency Energy Settlements for 2013 Events⁵

Load Management Events	MWh	\$	\$/MWh
July 15, 2013	2,625	\$1,931,991	\$736
July 16, 2013	2,660	\$1,947,402	\$732
July 18, 2013	6,104	\$7,529,023	\$1,233
September 10, 2013	4,937	\$6,940,584	\$1,406
September 11, 2013	26,259	\$30,999,121	\$1,181
January 7, 2014	17,914	\$22,679,000	\$1,266
January 8, 2014	3,572	\$3,516,649	\$985
January 22, 2014	694	\$1,205,359	\$1,737
January 23, 2014	5,948	\$7,072,731	\$1,189
January 24, 2014	2,032	\$2,636,926	\$1,298
March 4, 2014	5,837	\$5,819,933	\$997
Total	78,583	\$92,278,720	\$1,174
Notes			
1) MWh are at retail meter and not adjusted for line losses or marginal losses			
2) \$ include make whole payment (shutdown and offer price)			

⁵ Emergency Energy Settlement \$ value will be updated when it is billed.

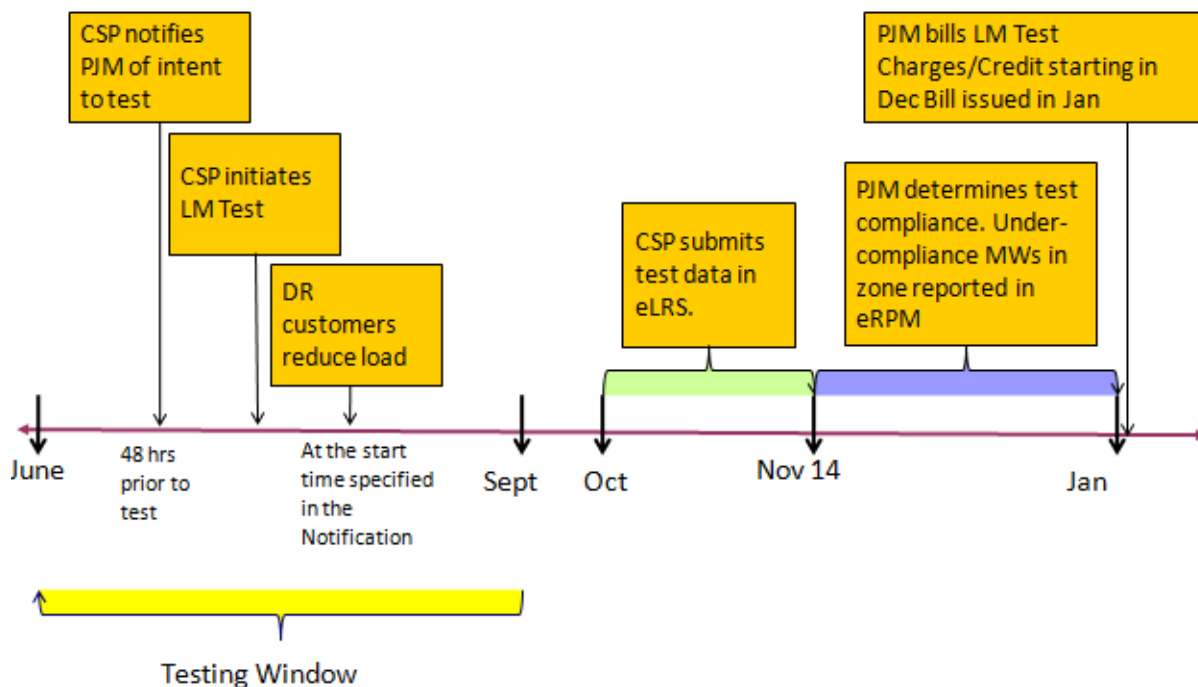
Test Requirement Overview

The Emergency DR (Load Management) Test is initiated by a Curtailment Service Provider (CSP) that has a capacity commitment. The CSP must simultaneously test all Resources in a Zone if PJM has not called an event in that Zone by August 15th of a given Delivery Year. If a PJM-initiated Emergency DR (Load Management) Event is called in a Zone between June 1st and September 30th there is no test requirement and no Test Failure Charges would be assessed to a CSP for that Zone.

The timing of a Emergency DR (Load Management) Test is intended to represent the conditions when a PJM-initiated Emergency DR (Load Management) event might occur in order to assess performance during a similar period. Therefore, a Emergency DR (Load Management) Test may occur from June 1st through September 30th on a non-holiday weekday during any hour from 12 noon until 8 PM EPT. All of a CSP's committed DR resources in the same Zone are required to test at the same time for a one hour period. The requirement to test all resources in a zone simultaneously is necessary to ensure that test conditions are as close to realistic as possible. It is requested that the CSP notify PJM of intent to test 48 hours in advance to allow coordination with PJM dispatch.

There is not a limit on the number of tests a CSP can perform. However, a CSP may only submit data for one test to be used by PJM to measure compliance. If the CSP's Zonal Resources collectively achieve a reduction greater than 75 percent of the CSP's committed MW volume during the test, the CSP may choose to retest the Resources in that Zone that failed to meet their individual nominated value.

Figure 25: Emergency DR (Load Management) Test Timeline



Emergency DR (Load Management) Resources are assessed a Test Failure Charge if their test data demonstrates that they did not meet their commitment level. The Test Failure Charge is calculated based on the CSP's Weighted Daily Revenue Rate which is the amount the CSP is paid for their RPM commitments in each Zone. The Weighted Daily Revenue Rate takes into consideration the different prices DR can be paid in the same Zone. For example, a CSP can clear DR in the Base Residual and/or Incremental Auctions in the same Zone, all of which are paid different rates. The penalty rate for under-compliance is the greater of 1.2 times the CSP's Weighted Daily Revenue Rate or \$20 plus the Weighted Daily Revenue Rate. If a CSP didn't clear in a RPM auction in a Zone, the CSP-specific Revenue Rate will be replaced by the PJM Weighted Daily Revenue Rate for such Zone.

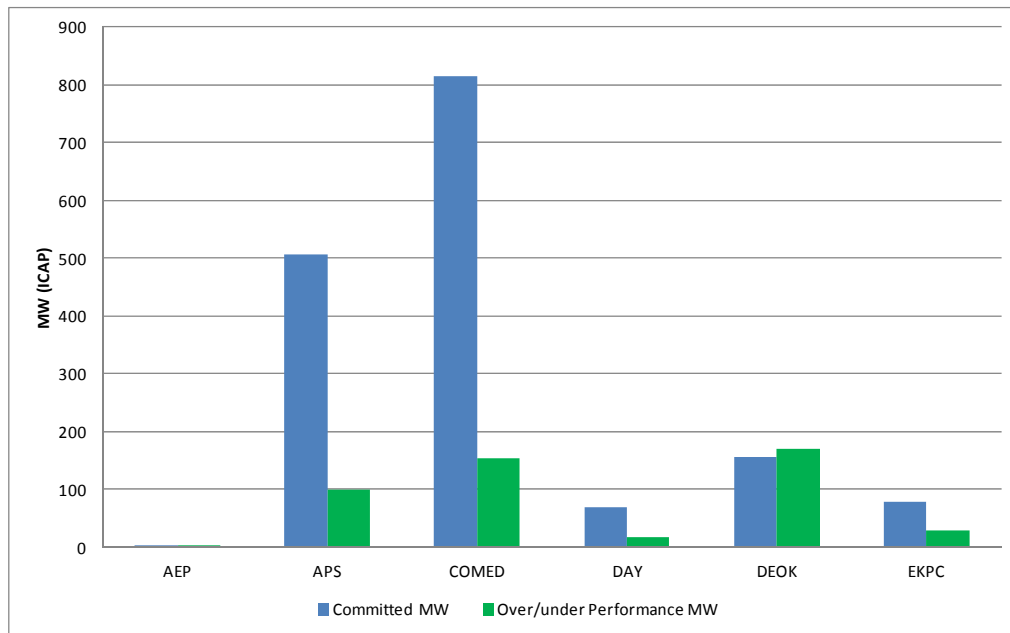
Test Performance

There were 1,627 MW in ICAP of committed Emergency DR (Load Management) Resources that were not called upon to participate in any 2013/2014 Delivery Year emergency event. As a result, these resources were required to perform a test to assess their performance capability. The over-compliance across all Zones and CSPs totaled 472 MW which equates to a performance level of 129 percent. In tabular form, the Zonal results are as follows:

Figure 26: Emergency DR (Load Management) Commitments, Compliance, and Test Performance (ICAP)

Test Results					
Zone	Committed MW	Reduction MW	Over/under Performance MW	Performance Percentage	
AEP	1.7	1.9	0.2	112%	
APS	506	606	99	120%	
COMED	814	969	155	119%	
DAY	69	87	18	126%	
DEOK	156	327	171	210%	
EKPC	80	108	28	135%	
Total	1,627	2,098	472	129%	

Figure 27: Emergency DR (Load Management) Test Obligations and Compliance (ICAP)



Test Failure Charges for the 2013/2014 Delivery Year are applied on an individual CSP/Zone basis for settlement purposes. However, the Test Failure Charges are reported on an aggregate basis here to preserve confidentiality. The average Penalty Rate for the 2013/2014 Delivery Year is \$37.21/MW-day (\$63.90 last year). This Penalty Rate is an average of \$44.12/day when weighted by the under-compliance amounts (\$53.09 last year). The annual penalties for under-compliance total about \$429,600 which will be allocated to RPM LSEs pro-rata based on their Daily Load Obligation Ratio (\$1.7 million last year). To better understand the order of magnitude, the under-compliance penalties compare to the total Emergency DR (Load Management) annual credits of just over \$558.7 million (\$267.5 million last year). Therefore, the under-compliance penalties are about 0.08 percent of the Emergency DR (Load Management) credits in the RPM (0.6 percent last year).