

DR as Operational Resource filing – summary of FERC order and impact to operational process

5/15/2014

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- MC approved changes included in "DR as Operational Resource proposal"
- Requested FERC to approve changes on 3/15/14
- 3/6/14 PJM received FERC deficiency letter
- 3/13/14 PJM sent response to letter and request for expedited treatment
- FERC order received 5/9/14
- Changes will impact 14/15 Emergency DR registration process and future Delivery Years



Compliance Obligations (must file in 30 days)

- Pre-Emergency vs Emergency resource classification:
 - either (i) justify the need for, and scope of, its proposed exemption [which allows locations with on-site generation used for demand resource to be classified as Emergency resource and therefore only need to respond to Emergency events and not Pre-Emergency events], including any necessary revisions to its Tariff to ensure that the exemption is properly tailored to the environmental restrictions imposed on these units, or (ii) remove the exemption for behind-the-meter demand response resources from its tariff [and require all locations to be designated at Pre-Emergency resources and therefore required to Pre-Emergency events].

PJM intends to provide compliance filing to justify need for and scope of proposed exemption.

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- 30 minute lead time mandatory for all resources unless physically not capable and qualify for exemption
 - Expand current mass market exception to 30 minute requirement to include similarly situated small commercial customers
- Measurement and verification
 - PJM believes FERC meant for PJM to file the "Enernoc" not "EnergyConnect" proposal.
 - Aggregate performance on wider basis than zone
 - Clarify load management event definition
 - PJM intends to file previously reviewed tariff material



Future Compliance filing based on stakeholder process

- 30 minute lead time mandatory for all resources unless physically not capable and qualify for exemption
 - PJM to work with stakeholders on transition mechanism that would allow CSPs that are no longer able to deliver amounts of demand response [because of 30 minute lead time requirement which becomes effective for 15/16 DY] previously cleared in PJM's capacity auctions [through 16/17 DY] to be relieved of part, or all of, their obligation and have their capacity payments commensurately reduced accordingly.

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- New Emergency energy offer prices by lead time
 - Issue report to FERC after 1 year describing the distribution of strike prices and notification times for demand response resources and how PJM handled their dispatch
 - PJM, with the input of the Market Monitor, to submit a report on compliance within nine months from the date of this order that provides an assessment of: (i) demand response resource dispatch by event, resource price, and notification time; (ii) the effectiveness of the dispatch of demand response resources under the new program (e.g., evidence of more efficient and economic dispatch practices); (iii) the effects of demand resource dispatch on Locational Marginal Price; and (iv) whether PJM's proposal addresses the Market Monitor's concerns related to market power and the interruption of shortage pricing signals, including the extent to which a uniform offer price cap could ameliorate these concerns.
- Exception resource to 30 minute lead time requirement
 - PJM will prepare and present to stakeholders an annual report on the aggregate quantities of demand response resources granted exceptions each delivery year.

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Summary Changes (2014-2015 DY)

Registration

- All registrations classified as Pre-Emergency or Emergency
 - Emergency = generation used for DR that can only operate under PJM emergency conditions due to environmental permit restrictions or as allowed by federal/state and local regulations.
- New 30 minute lead time approved and optional (still have 60 min and 120 min lead times)
- CSP must use new Pre-Emergency/Emergency energy offer price cap by lead time:
 - 30 minutes, Price <=\$1,000 /MWh plus Primary Reserve factor minus \$1
 - 60 minutes, Price <=\$1,000 /MWh plus (Primary Reserve factor/2)
 - 120 minutes, Price <=\$1,100 /MWh

Event

- Pre-Emergency (only Pre-Emergency resources respond) vs Emergency (only Emergency resources respond)
- Minimum event duration reduced from 2 hours to 1 hour

M&V

- PJM will measure compliance for partial dispatch clock hours based on prorated commitment based on number of minutes dispatched in hour where PJM dispatched for at least 30 minute of clock hour.
 - Ability to use 1 minute meter data instead of prorate process

Penalties

- No changes
- CSP Expected Load Reduction Reporting (used for PJM dispatch and price formation)
 - CSP provide aggregation expected real time load reductions by:
 - Zone (same as today), Lead time (note new 30 minute classification), Event type (Emergency vs Pre-Emergency), Product (previously approved rules)



Summary of Changes (2015-2016 DY)

Registration

- 30 minute lead time for all registrations unless registration does not have physical capability to respond in 30 min and needs 60 or 120 minutes
 - Exceptions currently published in new tariff language and will be expanded to include similarly situated mass market commercial customers.
 - Implement exception process in eLRS (detailed process will be published well in advance of 15/16 delivery year)
- Event
 - No additional changes
- M&V
 - No additional changes
- Penalties
 - No changes

Note: FERC did NOT approve requirement to measure compliance (assess penalties) for subzones that are created during the actual operating day.

- CSP Expected Load Reduction Reporting (used for PJM dispatch and price formation)
 - No additional changes



Summary of Changes – RPM auction commitments (2015-2016 and 2016/17 DYs)

PJM to work with stakeholders on transition mechanism
that would allow CSPs that are no longer able to deliver
amounts of demand response [because of 30 minute
lead time requirement which becomes effective for 15/16
DY] previously cleared in PJM's capacity auctions
[through 16/17 DY] to be relieved of part, or all of, their
obligation and have their capacity payments
commensurately reduced accordingly.

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Implementation details



Implementation Process: eLRS software changes (summary)

Expected Release Timeline

- 4/7 Publish key webservice documentation for changes
 - WSDL and Webservice User Guide
- 4/22 Deploy in sandbox/train environment
 - Issue with deployment some Get Event WS will time out.
 - PJM only doing limited emergency event simulations upon CSP request
- 5/13 Deploy fix to sandbox/train environment
 - WSDL remains same as published on ~4/7. No changes just fixing performance issue
- Tbd (~5/21) Deploy in production environment
- Tdb (~5/21) PJM to populate emergency registration (if CSP followed) guidelines for existing registrations)
- Tbd (~5/21) 5/31 CSP to make necessary changes in registrations
 - 30 minute lead time designation
 - Review and update emergency resource designation
 - Update offer prices for new thresholds as necessary

Production release date changed to 5/21 (to avoid any impact to 5/15 emergency registration deadline & fix economic DR bua)



Implementation Process: eLRS Registration Changes Interim process until software changes deployed

- Classify registration as pre-emergency or emergency resource
 - Default = Pre-emergency
 - Interim procedure to designate as Emergency
 - CSP to ensure location "Generator" load reduction capability > 0
 - CSP to ensure location Generator Permit Type = "Emergency Only"
 - CSP to include Comment in Registration = "Emergency Only"
 - PJM to follow up with CSP as necessary for any supporting information

Emergency resource = resource that uses behind the meter generation that has environmental restrictions that only allow it to run during PJM emergency conditions

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eLRS software change:

Pre-Emergency/Emergency Designation on Registration

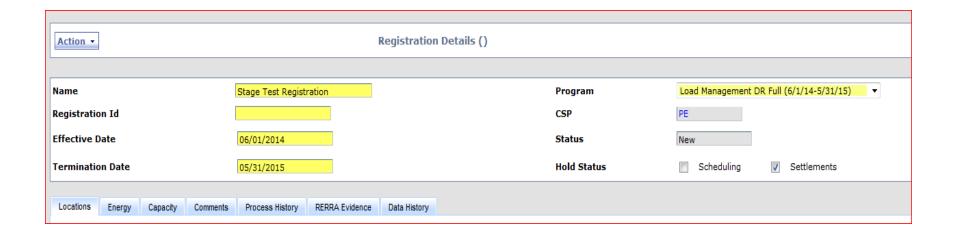
- Resource Type on emergency registrations:
 Values are 'Pre-Emergency', 'Emergency'
- Editable until start of Delivery Year
- Resource Type = 'Emergency' the following criteria must be met on at least one location:
 - Load Reduction Method : Generator must be > 0
 - Permit Type must be Emergency
 - Permit Status must be Available
- Test/Re-Test Events will not include the Resource Type designation as all must be tested together – no change to current rule of Zonal Test by CSP/Zone/Product

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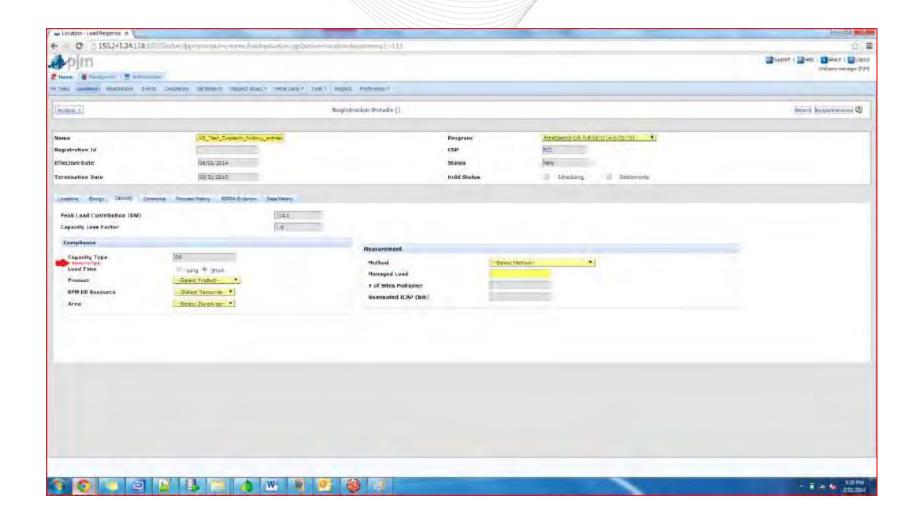
eLRS software change: Emergency Program Name Change

- Change to Program Names to eliminate confusion with Resource Type
- 'Emergency DR Full' will become 'Load Management DR Full'
- 'Emergency Cap Only' will become 'Load Management Cap Only'
- Change will be effective on all current and prior registration





eLRS software change: Pre-Emergency/Emergency Designation on Registration

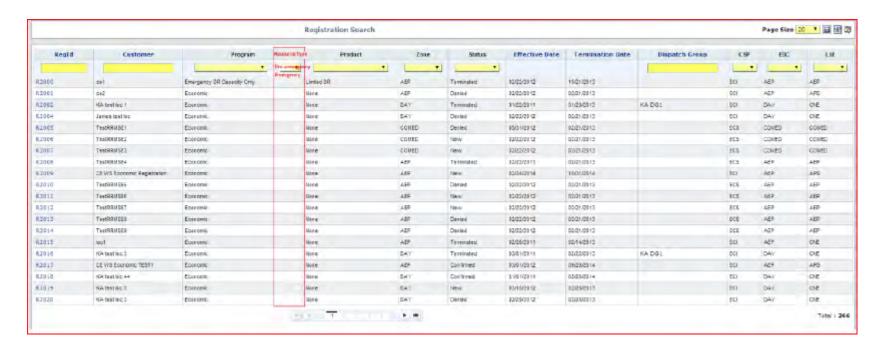


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eLRS software change: Pre-Emergency/Emergency Designation

- Registration Search has filter for Resource Type
- Values are 'Pre-Emergency', 'Emergency' and 'None'



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eLRS software change:

Pre-Emergency/Emergency Designation XML - Registration

- Web Services New Field on: 'Create Registration', 'Change Registration', also on 'Get Registration' Response
- <ns2:capacityInfo>

```
<ns2:capacityType>DR</ns2:capacityType>
```

<ns2:leadTime>Quick_30</ns2:leadTime>

<ns2:zoneArea>Day Area 0</ns2:zoneArea>

<ns2:measurementMethod>Firm Service Level</ns2:measurementMethod>

<ns2:capacityLossFactor>1.22</ns2:capacityLossFactor>

<ns2:peakLoadContribution>2258.0</ns2:peakLoadContribution>

<ns2:managedLoad>123.0</ns2:managedLoad>

<ns2:nominalICAP>150.06</ns2:nominalICAP>

<ns2:resourceType>Pre-Emergency</ns2: resourceType>

</ns2:capacityInfo>

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Implementation Process: eLRS Registration Changes

Designate lead time

- CSP to designate 60 (short) minute and 120 (long) minute same as today.
- CSP to designate "new" 30 minute lead time after software change but before DY begins
- Emergency Energy offer caps
 - CSP to input based on offer caps by lead time (for 14/15 DY) do not input price > cap in eLRS.
 - 30 minute lead time energy offer cap = \$1,549 /MWh
 - 60 minute lead time energy offer cap = \$1,275 /MWh
 - 120 minute lead time energy offer cap = \$1,100 /MWh

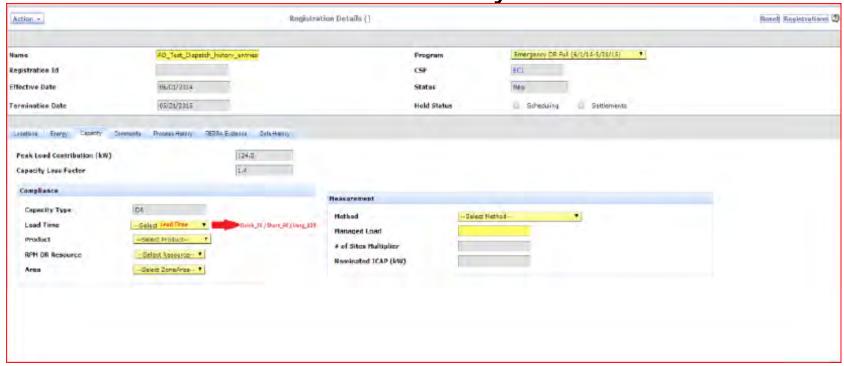
PJM will adjust all offer prices in eLRS > price cap to the price cap. CSP should review and modify to lower price as needed.

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eLRS software change: New Lead Time - Registration

- New Lead Time: Quick_30
- Rename current Lead Times to Short_60 and Long_120
- Editable until start of Delivery Year



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eLRS software change: New Lead Time XML – Create Registration

- Web Services new field name for 'Create Registration': leadTime
- Former field name will not be supported longLeadTime



eLRS software change: New Lead Time XML – Get Registration

Web Services Response for 'Get Registration'

```
<capacityInfo>
...
...
<ns2:leadTime>Long_120</ns2:leadTime> [for Long lead time]
    OR
<ns2:leadTime>Short_60</ns2:leadTime> [for Short lead time]
    OR
<ns2:leadTime>Quick_30</ns2:leadTime> [for Quick lead time]
...
...
</capacityInfo>
```

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Implementation Process: CSP registration activities prior to start of DY

- CSP must do following items on registration AFTER deployment of new eLRS version and BEFORE start of 14/15 DY
 - Review and update Resource Type (Emergency or Pre-Emergency)
 - Update lead time to 30 minute where necessary
 - Ensure offer price on registration is at or below thresholds
 - Update Webservices as necessary

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Implementation Process: Event Notification Changes

New criteria – highlighted in red

Criteria	Load Management Event
Туре	Pre-Emergency, Emergency
Lead Time	30, 60, 120 min
Product	Limited, Summer Extended, Annual
Location	Zone, Subzone

• eLRS, Emergency Messages, ALL CALL

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Implementation Process: Event Notification Changes Pre-Emergency and Emergency Load Management DRAFT All Call Scripts

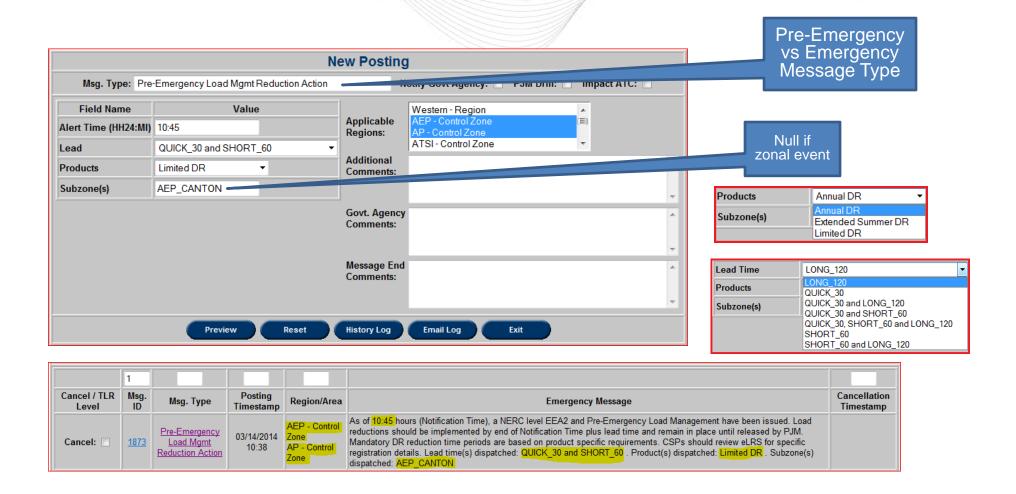
Pre-Emergency Load Management Event Notification:

- "This is (name) with an emergency procedures message. As of (state notification time) PJM
 has initiated a Pre-Emergency Load Management Event for the zones, products and lead
 times indicated on the PJM Emergency Procedures webpage and as communicated to
 Curtailment Service Providers through the eLRS system. See Emergency Procedure
 message identification number (insert EP message ID number) for details. This is (name)
 that is all."
- Emergency Load Management Event Notification:
- "This is (name) with an emergency procedures message. As of (state notification time) PJM has initiated an Emergency Load Management Event for the zones, products and lead times indicated on the PJM Emergency Procedures webpage and as communicated to Curtailment Service Providers through the eLRS system. See Emergency Procedure message identification number (insert EP message ID number) for details. This is (name) that is all."

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Implementation Process: Event Notification Changes (Emergency Procedures Messages)



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Implementation Process: Event Notification Changes (Emergency Procedures Messages)

MSG. ID	MSG. Type	Posting Timestamp	Regions/Area	Emergency Message	Cancellation Timestamp
12345	Pre- Emergency Load Mgmt Reduction Action		AE, AEP, AP, ATSI, BGE, ComEd, DAYTON, DEOK, Dominion, DPL, DLCO, EKPC, JC, ME, PECO, PN, PEPCO, PPL, PSEG, O&R	As of xx:yy hours (Notification Time), a NERC level EEA2 and Pre-Emergency Load Management have been issued. Load reductions should be implemented by end of Notification Time plus lead time and remain in place until released by PJM. Mandatory DR reduction time periods are based on product specific requirements. CSPs should review eLRS for specific registration details. Lead time(s) dispatched: QUICK_30, SHORT_60 and LONG_120. Product(s) dispatched: Limited DR, Extended Summer DR and Annual DR. Subzone(s) dispatched: SubZone name	

Example Emergency Message:

MSG. ID	MSG. Type	Posting Timestamp	Regions/Area	Emergency Message	Cancellation Timestamp
67890	Emergency Load Mgmt Reduction Action		AE, AEP, AP, ATSI, BGE, ComEd, DAYTON, DEOK, Dominion, DPL, DLCO, EKPC, JC, ME, PECO, PN, PEPCO, PPL, PSEG, O&R	As of xx:yy hours (Notification Time), a NERC level EEA2 and Emergency Load Management have been issued. Load reductions should be implemented by end of Notification Time plus lead time and remain in place until released by PJM. Mandatory DR reduction time periods are based on product specific requirements. CSPs should review eLRS for specific registration details. Lead time(s) dispatched: QUICK_30, SHORT_60 and LONG_120. Product(s) dispatched: Limited DR, Extended Summer DR and Annual DR. Subzone(s) dispatched: SubZone name	



- "Zonal Load Management" event ("parent event") name changed to "Load Management Summary" event.
 - Resource Type (add), Product, Lead Time (add 30 min), Zones, list of registrations.
- Load Management event ("individual registration event")
 - Add resource type and new lead time.

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eLRS software change:

Pre-Emergency/Emergency Designation XML - Event

 Web Services New Field on: 'Get Event' Response

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eLRS software change:

Pre-Emergency/Emergency Designation XML - Unack

 Web Services New Field on: 'Get Unack' Response

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Implementation Process: Measurement and Verification

			Capacity Commitment		
Method	Dispatch Start	Dispatch End	(MW)	HE14	HE15
Current Rules	13:40	14:40	1	n/a	n/a
New Rules (measure on prorata				n/a (dispatched	
basis if dispatched > 1/2 of hour	13:40	14:40	1	for < half of hour)	0.67

Commitment prorated down based on dispatch for only 2/3 of clock hour

- CSP hourly data submission will be same as today.
- CSP may submit 1 minute data if available to use for compliance calculation instead of time based prorate for partial dispatch compliance hour

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Implementation Process: Expected Load Reduction Reporting

- Similar to current process in eLRS but CSP will need to provide additional level of details.
 Expected load reductions will need to be reported by:
 - Pre Emergency vs Emergency
 - Lead time (new 30 lead time)
 - Product

This feature will be available in sandbox/train after 5/13 deployment

this enhancement is NOT is sandbox today —

The new xls template will be posted

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eLRS software change: DRAFT file upload format for Expected Load Reductions

Organization	ResourceType	Product	Zone	Lead Time	Start Date	End Date	Type	UOM	HE1	HE2	HE3	 HE25
ABC	Emergency	Limited DR	PECO	Quick_30	6/1/2013	6/1/2013	ExpRed	KW	4500	4500	4500	
ABC	Emergency	Limited DR	PECO	Short_60	6/8/2013	6/17/2013	ExpRed	KW	0	0	0	
ABC	Emergency	Limited DR	PECO	Long_120	6/13/2013	6/30/2013	ExpRed	KW	10000	10000	10000	
ABC	Emergency	Extended Summer DR	PECO	Quick_30	5/1/2013	5/1/2013	ExpRed	KW	4500	4500	4500	
ABC	Emergency	Extended Summer DR	PECO	Short_60	5/8/2013	5/17/2013	ExpRed	KW	0	0	0	
ABC	Emergency	Extended Summer DR	PECO	Long_120	5/13/2013	5/30/2013	ExpRed	KW	10000	10000	10000	
ABC	Emergency	Annual DR	PECO	Quick_30	12/1/2013	12/1/2013	ExpRed	KW	4500	4500	4500	
ABC	Emergency	Annual DR	PECO	Short_60	12/8/2013	12/17/2013	ExpRed	KW	0	0	0	
ABC	Emergency	Annual DR	PECO	Long_120	12/13/2013	12/30/2013	ExpRed	KW	10000	10000	10000	
ABC	Pre-Emergency	Limited DR	PECO	Quick_30	6/1/2013	6/1/2013	ExpRed	KW	50000	50000	50000	
ABC	Pre-Emergency	Limited DR	PECO	Short_60	6/8/2013	6/17/2013	ExpRed	KW	4500	4500	4500	
ABC	Pre-Emergency	Limited DR	PECO	Long_120	6/13/2013	6/30/2013	ExpRed	KW	0	0	0	
ABC	Pre-Emergency	Extended Summer DR	PECO	Quick_30	5/1/2013	5/1/2013	ExpRed	KW	10000	10000	10000	
ABC	Pre-Emergency	Extended Summer DR	PECO	Short_60	5/8/2013	5/17/2013	ExpRed	KW	4500	4500	4500	
ABC	Pre-Emergency	Extended Summer DR	PECO	Long_120	5/13/2013	5/30/2013	ExpRed	KW	0	0	0	
ABC	Pre-Emergency	Annual DR	PECO	Quick_30	12/1/2013	12/1/2013	ExpRed	KW	10000	10000	10000	
ABC	Pre-Emergency	Annual DR	PECO	Short_60	12/8/2013	12/17/2013	ExpRed	KW	4500	4500	4500	
ABC	Pre-Emergency	Annual DR	PECO	Long_120	12/13/2013	12/30/2013	ExpRed	KW	0	0	0	
ABC	Emergency	Limited DR	DUQ	Long_120	6/1/2013	6/30/2013	ExpRed	KW	10000	10000	10000	

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- Conforming Manual changes OC>MRC. OC approved and first read done at MRC. Manual changes will need to be revisited based on tariff changes that will be included in compliance filing:
 - Manual 11, 13, 18, 19, and 28

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- Q: What happens if location has generation that qualifies as Emergency but also plans to reduce HVAC load (pre-emergency type)?
 - A: Register as Emergency resource.
- Q: What happens if current registration (represents one customer)
 has location with >100 kw capability but also includes other small
 locations with same customer (<100 kw) where small locations do
 not in aggregate have => 100 kw nominated ICAP
 - A: CSP may keep the aggregation together and register as "emergency".
 This may only be done if with same customer and where sum of locations nominated ICAP is not =>100kw. This should not be done to avoid having locations classified as "Pre-Emergency".

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Summary of possible capacity M&V changes

- Load management compliance aggregated for time contiguous dispatches across operating day for all Zones (or sub-Zones) located in electrically-contiguous geographic areas with the same locational price separation for each RPM auction for the Delivery Year.
- If registration is dispatched twice in operating day then compliance will be aggregated based on above rule
 - if compliance is aggregated across each dispatch it will be considered 1 load management event
 - If compliance is NOT aggregated across each dispatch then it will be considered 2 load management events.

Existing process is to aggregate performance by zone

- See attached red lined tariff changes -



Potential Aggregation Areas for 2014/2015 Delivery Year

		Resource Clearing Price (\$/MW-day) for Annual Product						
Auction	Rest of RTO	Rest of MAAC	Rest of EMAAC	Rest of SWMAAC	Rest of PS	PS Nort h	DPL South	PEPCO
BRA	125.9 9	136.50	136.50	136.50	136.50	225.0 0	136.5 0	136.50
1 st IA	5.54	16.56	16.56	16.56	16.56	410.9 5	16.56	16.56
2 nd IA	25.00	56.94	56.94	56.94	56.94	310.0	56.94	56.94
3 rd IA	25.51 9	gregation 32.20	on Areas 132.20	for 2014/2 132.20	U15 Del 132.20	1 very 1	rear 132.2	132.20

Aggregation Area	Zones
Rest of RTO	AEP, APS, ATSI, COMED, DAY, DEOK, DLCO, DOM, EKPC
MAAC (excluding PS North)	AE, DPL, JCPL, PECO, Rest of PS, RECO, BGE, PEPCO, PENLC, METED, PPL
PS North	PS North sub-zone

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