

Demand Response Capacity Performance filed changes: Summer Period DR and CP M&V changes

DRS

4/7/2017



Current CP Capacity compliance – measurement of load reductions

- DR Capacity Nomination
 - PLC – $(FSL * \text{loss factor})$
- Summer (June – September)
 - FSL (firm service level)
 - PLC – $(\text{Load} * \text{Line Loss Factor})$
 - GLD (guaranteed load drop)
 - Lessor of FSL or $(CBL - \text{load}) * \text{line loss factor}$
- Non-summer (October through May)
 - $(CBL - \text{load}) * \text{line loss factor}$
- CBL – customer baseline, which represents what load would have been if customer did not reduce load (measure real time load reduction).

Load Reduction used to determine penalties or bonus payment

- PJM filed changes at FERC:
 - Auction changes (**effective 20/21 DY, May 2017 BRA**)
 - PJM clearing of summer and winter resources
 - Winter CIR transition
 - Create new Summer Period DR product
 - Ability to Aggregate across the RTO (no longer limited to LDA)
 - CP registration and M&V changes (**effective 6/1/17**)
 - Winter vs Summer nomination
 - Winter Peak Load and Winter FSL.

PJM intends to move forward based on FERC order but FERC could change outcome later

Product modelled as individual eRPM resource

1 resource modelled in eRPM with seasonal commitments



Product	16/17	17/18	18/19	19/20	20/21
Limited DR	X	X			
Extended Summer DR	X	X			
Annual DR	X	X			
Base DR			X	X	
Capacity Performance DR	X	X	X	X	X
Summer Period DR					X

-- Customers are registered in eLRS by Product --

**FRR – LDR/XDR/ADR through 18/19, 19/20 Base/CP, 20/21 CP*

CP Demand Resource transition to be more consistent with other capacity resources

Requirement	(Today) Limited DR (15/16 – 17/18)	(Today) Extended Summer DR (15/16 – 17/18)	(Today) Annual DR (16/17 – 17/18)	(CP) Base Capacity DR (18/19 & 19/20 DY only)	(CP) Capacity Performance DR (16/17 DY & beyond)	(CP) Summer Period DR (20/21 and beyond)
Availability	Non-NERC holiday weekday, June – Sept	June – Oct & May	Any day during DY*	June - Sep	Any day during DY*	June – Oct & May
Maximum Number of Interruptions	10 interruptions	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Hours of Day Required to Respond (Hours in EPT)	12:00 PM – 8:00 PM	10:00 AM – 10:00 PM	June – Oct & May: 10 AM – 10 PM Nov. – April: 6 AM- 9 PM	10:00 AM – 10:00 PM	June – Oct. & May: 10 AM – 10 PM Nov. – April: 6 AM- 9 PM	10:00 AM – 10:00 PM
Maximum Duration of Interruption	6 Hours	10 Hours	June – Oct : 12 hours Nov – April: 15 hours	10 Hours	June – Oct : 12 hours Nov – April: 15 hours	12 Hours

*unless on an approved maintenance outage during Oct – Apr.

- New name to help keep clear (did not reuse Extended Summer DR)
- June through Oct and May (6 months)
- Receive 6 months of capacity revenue
- Everything will be handled similar to Extended Summer DR except:
 - 6 months of revenue
 - Only clears if there are winter resources (additional winter capability)
 - CP penalty structure (PAH, penalty rates)

- Process handled same as Extended Summer DR
 - Must link to eRPM resource
 - Nomination based on PLC
 - M&V based on PLC
 - Voluntary participation if dispatched during non-summer period
 - Product substitution rules

- CSP determines Summer and Winter nominated capacity MWs with summer vs winter FSL
 - Annual nomination is the lessor of:
 - Summer nominated capacity = $PLC - [FSL(\text{summer}) * \text{line loss factor}]$
 - Winter nominated capacity = $\{\text{Winter Peak Load} * \text{Winter Weather Adjustment Factor} - FSL(\text{winter})\} * \text{line loss factor}$

- **Customer Winter Peak Load**
 - PJM publishes winter 5 CP days (Dec/Jan/Feb)
 - CSP calculates Customer Winter Peak Load = customer's peak demand on PJM Winter 5 CP days from 6am through 9pm (CP availability window) and calculate average of the 5 values.
 - Customer Winter Peak Load based on Delivery Year – 2
 - Can be calculated at same time PLC is determined.
- **Winter Weather Adjustment Factor (zonal WWAF)**
 - Zonal Weather Normalized Winter Peak / Zonal Average of 5 CP Loads in Winter
 - PJM calculates and applies during capacity nomination on the registration

[Winter 5CPs and WWAF by zone - http://www.pjm.com/~media/markets-ops/demand-response/2015-2016-dy-pjm-winter-peaks-for-wpl-calculation.ashx](http://www.pjm.com/~media/markets-ops/demand-response/2015-2016-dy-pjm-winter-peaks-for-wpl-calculation.ashx)



WPL calculation example

EDC Account #	0129384091234					
Date	Fri, 12/15/17	Thu, 1/4/18	Tue, 1/16/18	Fri, 1/19/18	Mon, 1/22/18	
HE1	1,694	1,876	1,885	1,996	1,725	
HE2	1,697	1,773	1,908	2,044	1,690	
HE3	1,694	1,819	1,882	1,955	1,749	
HE4	1,727	1,812	1,757	1,606	1,716	
HE5	1,710	1,825	1,709	1,781	1,739	
HE6	1,740	2,046	1,944	1,912	1,599	
HE7	1,959	2,213	1,993	1,977	1,555	
HE8	2,084	2,290	1,991	2,078	1,790	
HE9	2,015	2,298	2,042	2,224	1,985	
HE10	2,014	2,421	2,025	2,331	2,102	
HE11	2,098	2,363	1,815	2,323	2,003	
HE12	2,089	2,305	1,805	2,249	2,023	
HE13	2,005	2,244	1,843	2,167	2,007	
HE14	2,073	2,325	2,007	2,131	2,049	
HE15	1,969	2,210	2,016	2,062	1,926	
HE16	1,912	2,134	1,976	2,035	1,813	
HE17	1,791	2,121	1,959	2,032	1,887	
HE18	1,777	2,131	1,858	1,947	1,758	
HE19	1,817	2,066	1,733	1,860	1,658	
HE20	1,768	2,113	1,691	1,883	1,619	
HE21	1,718	1,974	1,550	1,800	1,609	
HE22	1,742	1,898	1,506	1,828	1,675	
HE23	1,695	1,858	1,181	1,871	1,621	
HE24	1,651	1,820	721	1,740	1,602	
Peak7_21	2,098	2,421	2,042	2,331	2,102	2,199

- **Capacity Performance Registrations**
 - Registration
 - CSP must input Customer specific Winter Peak Load (“WPL”) and Winter FSL
 - Nomination is capped at lower of Summer and Winter nominated MWs
 - Winter capacity compliance
 - November - April (instead of October – May)
 - Load Reduction based on Winter Peak Load instead of CBL
- **Other Registrations (Economic, LDR, XDR, ADR)**
 - No impact
 - Not eligible for bonus payment in 17/18 (transition year)
 - When eligible for bonus payment then will need PLC for summer and WPL for non-summer.

- CSP should NOT mark CP registration as complete until the following is done.
- CSPs get winter load data & calculates WPL
 - PJM winter CP days and zonal winter weather adjustment factors have been published
- ~5/12 - PJM will modify DR Hub to collect WPL, Winter FSL and calculate Winter/Annual Nominated Icap.
- Before 6/1/17 – CSP to upload data
 - Load data for 5 days used to calculate WPL (use standard DR Hub upload process)
 - Input WPL and Winter FSL into DR Hub (functionality to be available by 5/12)

If there are any delay with DR Hub functionality we will use excel template process

- Q&A
- Typical registration timeline
- Compliance example
- DR Registration example for summer capability only customer and winter capability only customer

- Q: Is there a limit on load reductions?
 - A: Summer load reductions are limited to PLC and non-summer load reductions are limited to Weather Adjusted Winter Peak Load
- Q: Will this proposed measurement method replace the CBL method for non-summer capacity compliance assessment?
 - A: Yes
- Q: Will EDCs calculate and distribute Winter Peak Load as part of PLC calculation & distribution process?
 - A: Need to discuss
- Q: How do I calculate the Customer Winter Peak Load?
 - Take the customer's peak load from 6am through 9pm for each of the 5 PJM Winter Peak days and average the 5 values.

- Apr 2016
 - PJM publishes Winter 2015/2016 (Dec 2015, Jan/Feb 2016) 5 CP days
 - PJM publishes Zonal Winter Weather Adjustment Factor
- Oct 2016
 - PJM publishes Summer 2016 5 CP days/hours
- Jan 2017
 - EDC distributes PLC for 2017/2018 based on summer load in 2016
 - CSP calculates Customer Winter Peak Load based on Winter 2015/2016 (Dec 2015 and Jan/Feb 2016)
- Jan – May 2017
 - CSP registers DR for 2017/2018 DY

DR Resource with Customer Registrations shown below

Assume this case where only 1 registration (below) is linked to RPM resource

RPM resource may have up to 17 CP annual and additional 5 MW Summer Period DR commitment without penalty.

		1	2	(3) = (1) - (2)	(4)	(5)	(6) = (4) *(5)	7	8 = (4) - (7)	9 = Min (3 & 8)
Location #	Customer Load Profile	Summer PLC (MW)	Summer FSL (MW)	Summer Nominated DR Value (MW)	Winter Peak Load (MW)	Winter Weather Adjustment Factor	Weather Adjusted Winter Peak Load (MW)	Winter FSL (MW)	Winter Nominated DR Value (MW)	Annual Nominated DR Value (MW)
1	Winter load lower than summer load	10	5	5	8	1.05	8.4	5	3.4	
2	Winter load higher than summer load	10	5	5	12	1.05	12.6	5	7.6	
3	Winter load equal to summer load	10	5	5	10	1.05	10.5	5.5	5	
4	Summer only DR (A/C Cycling)	10	4	6	6	1.05	6.3	6.3	0	
5	Winter only DR (Ski Load)	1	0	1	12	1.05	12.6	11.6	1	
Registration		41	19	22			50.4	33.4	17	17
Column										
1	Summer PLC based on the current process									
4	Winter Peak Load = customer peak on 5 winter CP days from HE7 through HE21 (Capacity Performance DR availability requirement) for Dec/Jan/Feb									
5	Winter Weather Adjustment Factor published and applied by PJM = Weather Normalized Winter Peak/Actual Winter Peak									
9	Annual Nominated DR Value based on registered nominated amount									

Additional Notes

Capacity Reduction will be used for Add Back in Summer and Non-summer periods

Winter Peak Load is adjusted up for transmission and distribution line loss factor

Winter load reductions may not exceed Winter Peak Load.

Load has already been grossed up for losses

		1	(6) = (4) *(5)	(10)	(11) = (1) - (10)	(12)	(13) = (6) - (12)
Location #	Customer Load Profile	Summer PLC (MW)	Weather Adjusted Winter Peak Load (MW)	Load (MW)	Load Reduction (MW)	Load (MW)	Load Reduction (MW)
1	Winter load lower than summer load	10	8.4	5	5	5.5	2.9
2	Winter load higher than summer load	10	12.6	5	5	6	6.6
3	Winter load equal to summer load	10	10.5	5	5	5	5.5
4	Summer only DR (A/C Cycling)	10	6.3	3	7	6.3	0
5	Winter only DR (Ski Load)	1	12.6	1	0	5.6	7
Registration		41	50.4		22		22

- CSP must ensure that sum of nominated MWs on all registrations reflects resource capability for entire year for required hours.

eRPM resource	Registration	EDC Acct #	Summer Capability (MW)	Winter Capability (MW)	Capacity Nomination
PECO resource	Registration A	1029384710	10	0	10
		999128347	0	10	

10 MW is annual capability

PJM will allow locations to be aggregated on same registration if they have "season only" capability