

DR RPM Issues

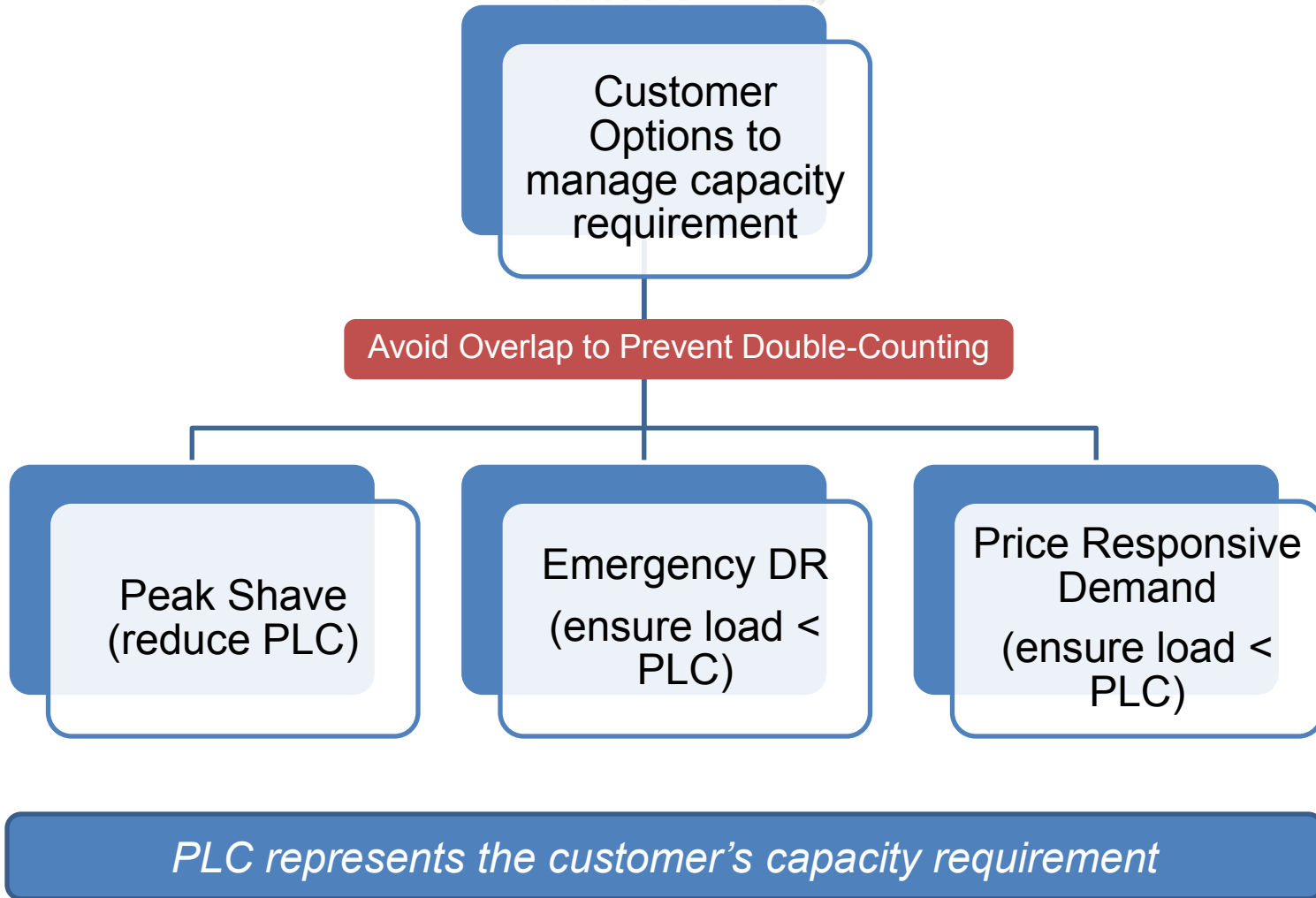
November 9, 2012
CSTF

- Continue to define issue/problem
- Communicate existing process and rules
 - Identify any additional material or detail that will assist

DR ITEM # 3: Interaction of Peak Load Contribution ("PLC") with end-user RPM cost assignment and DR Resource RPM revenue, and implication to DR resource auction participation

Proposed short term specific issues:

- A. Customer PLC Risk - Customer wants to be fully interruptible but does not know PLC 3 years in advance for BRA
- B. PLC may not be the “most” accurate reflection of individual customer’s capacity requirement
 - Customer load changes (growth or decline) is incorporated in PLC on a lagged basis - Customer’s load will grow this year but PLC is based on prior year’s load



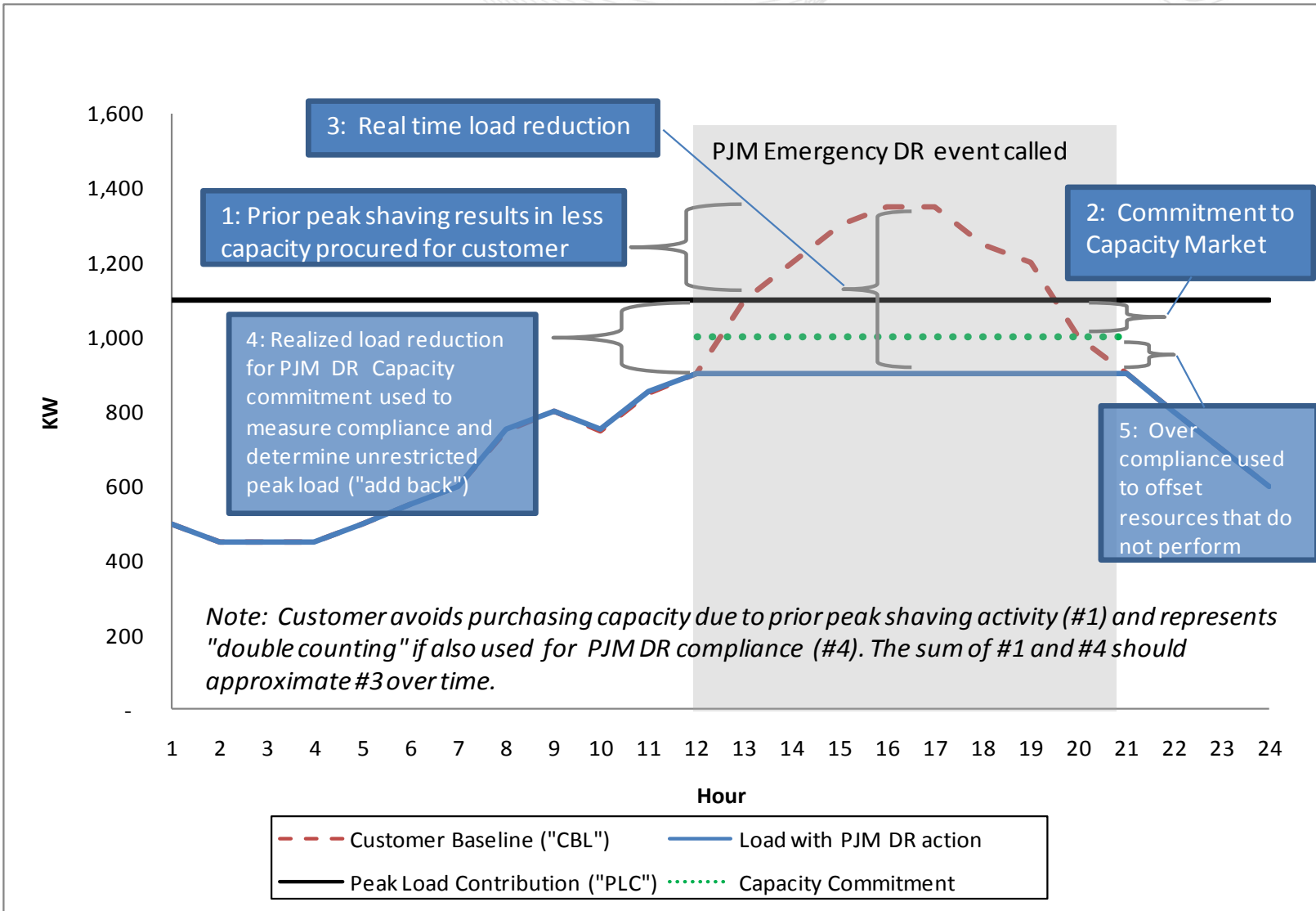
DR nominates
based on PLC

DR compliance
based on load
reduced below
PLC

DR add backs
based on load
reduced below
PLC

PLC represents the capacity (reliability) requirement for the customer

Steps	Activity	Jan-09	Apr-09	Jun-09	Oct-09	Jan-10	Apr-10	Jun-10	Oct-10	Jan-11	Apr-11	Jun-11	Oct-11	Jan-12	Apr-12	DY 1				DY 2				
																	Jun-12	Oct-12	Jan-13	Apr-13	Jun-13	Oct-13	Jan-14	Apr-14
1	Forecast to determine Reliability Requirement		█																					
2	BRA auction - DR capacity commitments for DY1		█																					
3	Customer 5 CP usage used as input to PLC for DY1										█													
4	EDC makes available customer PLCs (~1/1).													█										
5	CSP registers DR - nomination based on load < PLC													█										
6	CSP event performance (depends on product)													█										
7	CSP test performance													█										
8	CSP add backs for DY 2 based on usage in summer DY 1																							
9	Customer 5 CP usage used as input to PLC for DY1																							
10	EDC makes available customer PLCs (~1/1) for DY 2																							



- Unforced Capacity (UCAP) Obligations are obligations assessed to LSEs to satisfy the reliability requirements during the delivery year.
- Total UCAP Obligation is based on net capacity procured in RTO as a result of the Base Residual and all Incremental Auctions. RTO Obligation is then allocated to Zones.
- Zonal UCAP Obligations are allocated to and paid for by individual LSEs who serve load in the Zone. This allocation is based on PLCs of the end-use customers served by the LSEs.

RTO:

- Obligation = Net capacity procured in all auctions = 131,727 MW
- 2012 Peak Load Forecast adjusted for FRR = 115,220 MW
- Reliability Requirement = peak load * FPR = 115,220 * 1.0869 = 125,233 MW
- Obligation Peak Load Scaling Factor = $131,727/125,233 = 1.05186$

PECO Zone:

- 2011 Summer Weather Normalized Peak = 8,370 MW
- 2012 Peak Load Forecast = 8,450 MW
- Zonal Peak Load Scaling Factor = $8,450/8,370 = 1.00956$
- Final Zonal RPM Scaling Factor (FZSF) = $1.00956 * 1.05186 = 1.06191$

End-Use Customer with PLC = 10 MW:

- UCAP Obligation = PLC * FZSF * FPR = $10 * 1.06191 * 1.0869 = 11.5 \text{ MW}$
- UCAP value of DR equal to PLC = Demand reduction * DR Factor * FPR = $10 * 0.954 * 1.0869 = 10.4 \text{ MW}$

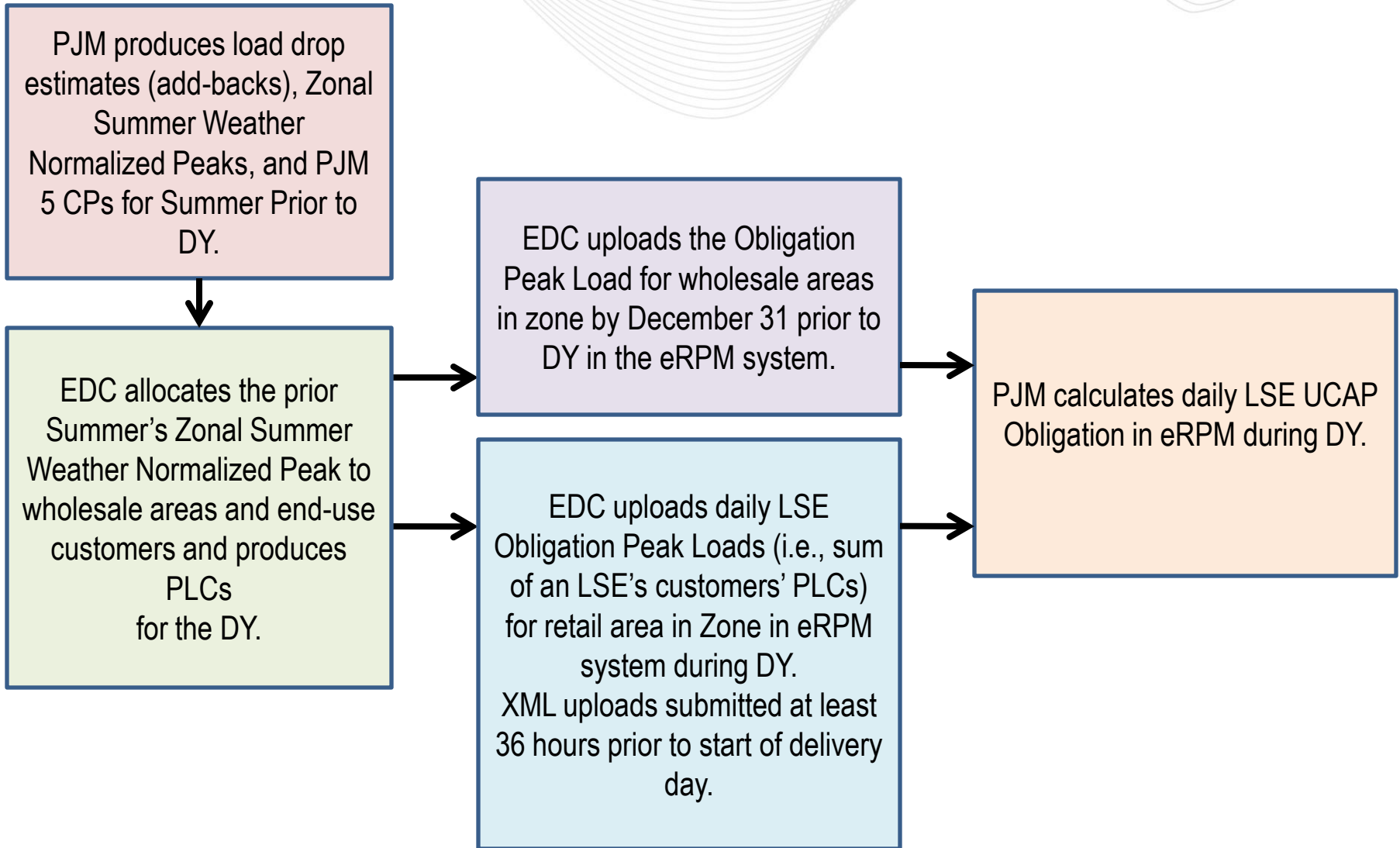


How are Final RTO and Zonal UCAP Obligations Determined?

When Determined?	Final RTO and Zonal UCAP Obligation
After clearing of the final Incremental Auction for the DY.	<p>Final RTO UCAP Obligation = Total UCAP in RTO = UCAP cleared in BRA + (Participants Sell Offers – Participants Buy Bids) cleared in all RPM Incremental Auctions.</p> <p>Zonal UCAP Obligation: Zonal allocation of the Final RTO UCAP Obligation pro rata based on Final Zonal Peak Load Forecasts.</p>



PLCs & LSE UCAP Obligation Calculation: Process Overview

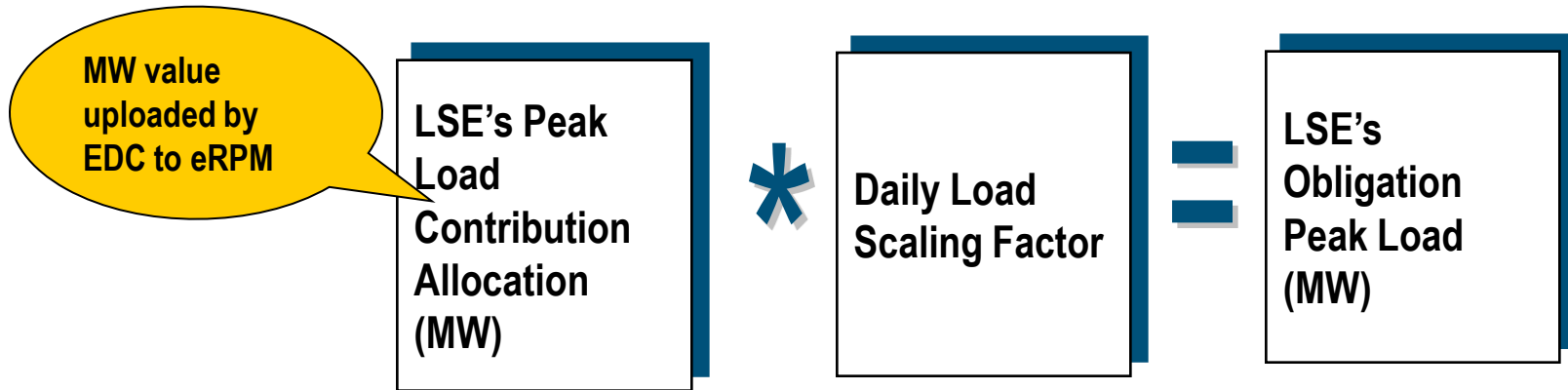


- The daily sum of all the uploaded LSE peak load contribution data in a zone/area will be scaled to equal the Annual Obligation Peak Load Allocation for the zone/area

$$\text{Daily Load Scaling Factor} = \frac{\text{EDC Obligation Peak Load annual allocation to the zone/area}}{\Sigma \text{ Uploaded LSE Peak Load Contribution Values to zone/area}}$$

The Daily Load Scaling Factor will equal 1.0 in cases where the sum of the uploaded LSE Peak Load Contribution values equal the Annual Allocation for that zone/area.

An LSE's Daily Obligation Peak Load in a zone/area =



Changes to an LSE's Daily Obligation Peak Load **DO NOT** require any action on part of the LSE.

- PLC determines customer capacity requirement
 - LSE capacity requirement
 - DR nomination, compliance and add backs tied together
 - DR nomination $<$ PLC
 - DR compliance, Load $<$ PLC
 - DR add backs, Load $<$ PLC
- PLC determined by each EDC primarily based on:
 - Zonal weather normalized peak load
 - Average of load during 5 CP hour/days
 - Customer add backs
 - Scalar factors to ensure sum of customer PLCs = zonal PLC

- Process for customer to reduce capacity requirement?
 - Peak Shave – must forecast PJM 5 CP days/hours and reduce load to zero on such days/hours.
 - DR – predict customer PLC (customer load on 5CP days/hours) and associated factors 3 years in advance and offer into BRA
 - Modify commitment in IA based on updated customer PLC forecast
 - CSP manages portfolio of customer commitments
 - Some customers' PLC may go up and some may go down

Are there more accurate ways to determine customer PLC

Zonal UCap Obligation

- PJM forecast
- PJM zonal weather normalized peaks
 - Scaling factor

Customer PLC

- EDC determination of customer specific PLC
 - Primarily based on 5 CP methodology



- Process to handle load changes?
 - PLC calculated based on prior summer load
 - Load growth or decline reflected in PLC on a lagged basis.
- Example
 - Customer load increases by 20% starting in November 2012.
 - PLC calculated for next DY (13/14) will be based on usage from summer 2012 which will not reflect load growth
 - Customer PLC will be low because of time lag.
 - PLC calculated for subsequent DY (14/15) will reflect load growth since it will be based on load during summer 2013.

DR ITEM # 5: Measurement and Verification of different PJM resources and products

Discuss and refine short term issues that need to be addressed

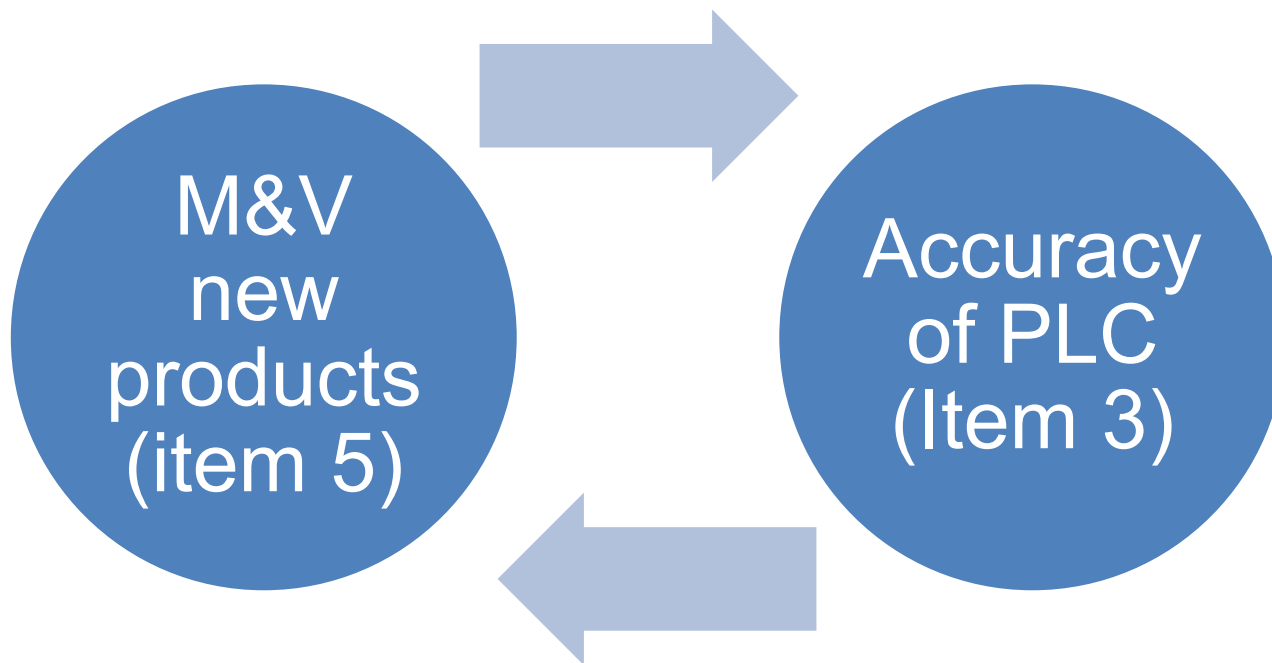
- 1) Some loads may not provide response during non-summer but nominate as Annual DR product because the non-summer load will already be below FSL.
 - 1) Non-summer load drop is already accounted for in IRM determination

Requirement	Limited DR	Extended Summer DR	Annual DR
Availability	Any weekday, other than NERC holidays, during June – Sept. period of DY	Any day during June-October period and following May of DY	Any day during DY (unless on an approved maintenance outage during Oct. - April)
Maximum Number of Interruptions	10 interruptions	Unlimited	Unlimited
Hours of Day Required to Respond <i>(Hours in EPT)</i>	12:00 PM – 8:00 PM	10:00 AM – 10:00 PM	Jun – Oct. and following May: 10 AM – 10 PM Nov. – April: 6 AM- 9 PM
Maximum Duration of Interruption	6 Hours	10 Hours	10 Hours
Notification	Must be able to reduce load within 2 hours of notification		
Event Compliance	Data due 45 day after end of event month		
Test Compliance	Mandatory test required if no emergency event called		

- Guaranteed Load Drop (GLD) required to reduce load below PLC
- Load Drop used to determine capacity compliance also used to determine add back
- GLD or Economic Load Reduction (where applicable):
 - Minimum of $\{(comparison\ load - Load) * LF, PLC - (Load * LF)\}$
- Firm Service Level (FSL):
 - $PLC - (Load * LF)$

All products, resources and events measured based on same criteria except non-interval metered DLC

- Customer may not need to take any actions since load may naturally be $<$ FSL amount
 - For example, AC cycling customer as Annual DR



LM Compliance Penalty Rate depends on the time period in which the event is called.

On Peak: Any weekday, other than NERC holidays, during June-Sept period of DY from 12 PM to 8 PM

Off Peak: All days and hours outside of the above defined On Peak period

- On-Peak LM Compliance Penalty Rate (\$/MW-yr) =
Lesser of (1/actual number of events during the delivery year, or 50%) * Party's Weighted Daily Revenue Rate (\$/MW-yr)
- Off-Peak LM Compliance Penalty Rate (\$/MW-yr) =
1/52 * Party's Weighted Daily Revenue Rate (\$/MW-yr)
- If a LM Event is comprised of both an On-Peak and Off-Peak Periods, the LM Penalty Rate (\$/MW-yr) =
The higher of the charges based on:
 - (A) Lesser of (1/actual number of events during the delivery year, or 50%) * Party's Weighted Daily Revenue Rate (\$/MW-yr); OR
 - (B) 1/52 * Party's Weighted Daily Revenue Rate (\$/MW-yr)

DR ITEM # 6: DR notification time during non-critical summer hours

Discuss and refine short term issues that need to be addressed

- Customer may not be able to commit to Annual DR product because notification time does not allow resources enough time to prepare for event
 - Non-Summer early am is specific issue (notified at 4am to be down at 6am)

- DR is only called during emergency conditions
- CSP determines each registration's notification time:
 - Long lead (2 hours)
 - Short lead (1 hour)
- Notification times are submitted as part of registration process and applicable for entire Delivery Year.
- Penalty structure is significantly different for on peak vs off peak periods