

Reliability Pricing Model Resource Performance Assessments

RPM Training – Section F
February 2012

- Provide the means to assess whether or not a resource honored their commitments and provided the expected reliability services during the Delivery Year.
- Incent resource providers to perform through exposure to deficiency or penalty charges
- Deficiency or penalty charges are distributed to LSEs or over-performing resource providers.

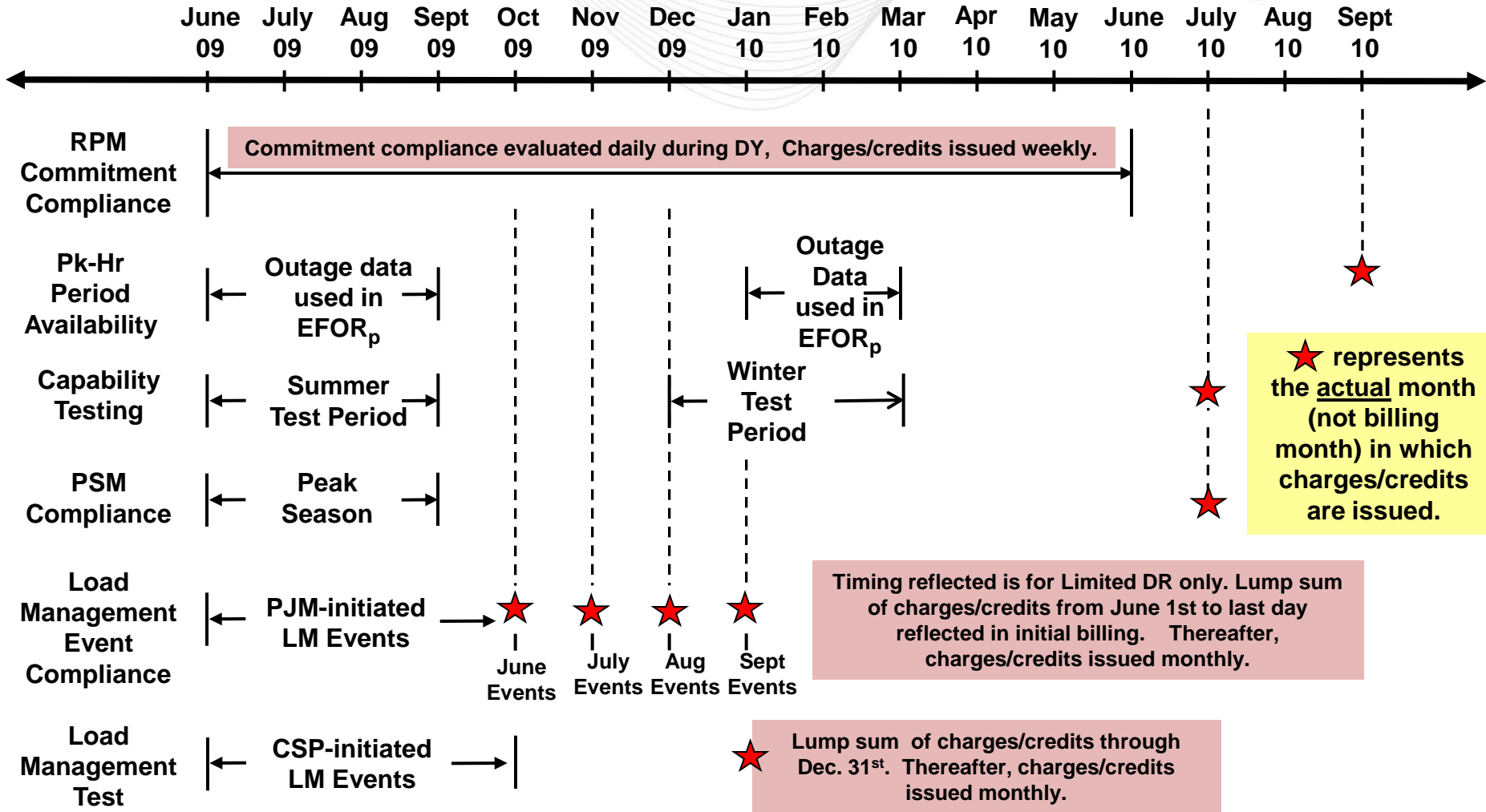
Assessment	Purpose
RPM Commitment Compliance	Determines if sufficient unforced capacity on resource during DY to meet its RPM commitments
Peak-Hour Period Availability	Measures if generation resource was available during critical peak-hour periods during DY
Summer/Winter Capability Testing	Determines if generation resource demonstrated its ICAP commitment amount through summer and winter testing
PSM Compliance	Determines if generation resource took an unapproved planned or maintenance outage during peak season period
Load Management Event Compliance	Determines if committed demand resource or certified ILR resource reduced load during a PJM-initiated LM event
Load Management Test Compliance	In the absence of a PJM-initiated LM event, this assessment determines if committed demand resource or certified ILR resource reduced load during a CSP-initiated test

- Resources with RPM Commitments
 - Resources that cleared in RPM Auctions
 - Resources that received make-whole payments
 - Replacement resources
- Resources with FRR Commitments
 - Resources included in FRR Capacity Plan

Portions of the resource that do not have an RPM Commitment or FRR Capacity Plan Commitment during the Delivery Year are not subject to resource performance assessments and the associated deficiency/penalty charges.

Assessment	Generation (except Hydro, Wind & Solar)	Hydro	Wind & Solar	DR	EE	QTU
RPM Commitment Compliance*	X	X	X	X	X	X
Peak-Hour Period Availability	X	X				
Summer/Winter Capability Testing	X	X (Annual)				
PSM Compliance	X					
Load Management Event Compliance				X		
Load Management Test Compliance				X		

*A resource or portion of a resource committed to the FRR Alternative is not subject to RPM Commitment Compliance. Instead of unit-specific commitment compliance, FRR Entities are subject to a daily unforced capacity obligation compliance.



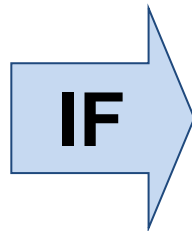
- RPM Commitment Compliance is evaluated during the Delivery Year on a ***resource-specific basis*** to determine if a Resource Provider has enough unforced capacity to satisfy their Daily RPM Resource Commitments on their generation resources, demand resources, or Qualifying Transmission Upgrades.

RPM Commitment Compliance is not determined based on party's portfolio of resources (generation, DR, EE, or QTUs) in a party's eRPM account. RPM Commitment Compliance is evaluated separately for each resource in a party's eRPM account.

- A failure to meet their daily RPM Resource Commitments may be due to the following reasons:
 - Unit cancellations, delays, deratings, or retirements
 - Unit EFORD increases
 - Failure to register enough sites in eLRs prior to start of DY
 - Failure to demonstrate the Nominated EE Value in a Post-Installation EE M&V Report prior to DY
 - Decrease in DR Factor or FPR from the DR Factor or FPR Factor that was used in the RPM Auction for which a DR Resource or EE Resource cleared
 - Qualifying Transmission Upgrade Delay

During the Delivery Year, a party's Daily RPM Resource Position is compared to their Daily RPM Resource Commitments to determine if a RPM Capacity Resource Deficiency Charge is to be assessed on the delivery day.

Capacity Resource Deficiency



Daily RPM Resource Commitment For Unit/Demand Resource/EE Resource

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Daily RPM Resource Position For Unit/Demand Resource/EE Resource

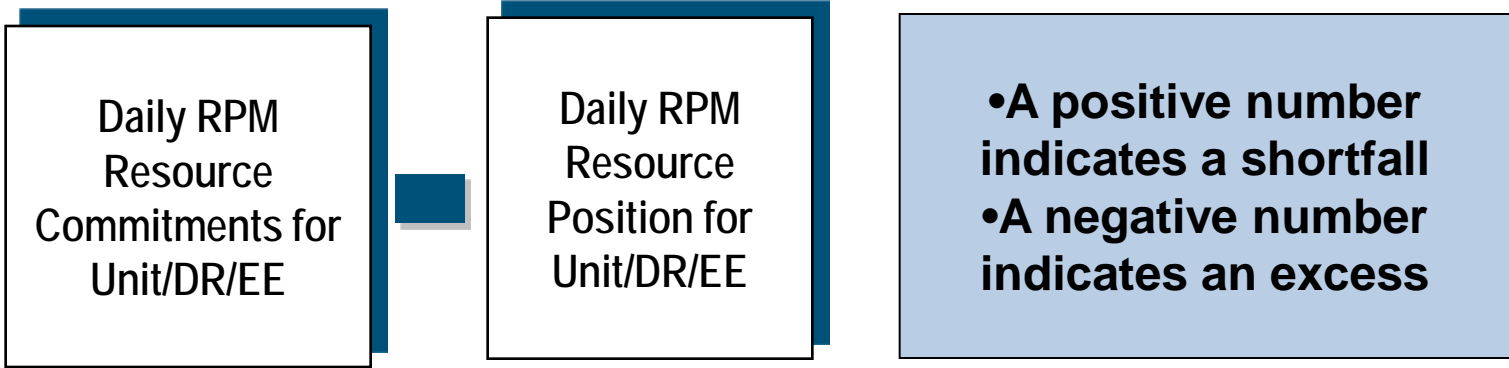
Includes sum of cleared and make-whole UCAP, sum of unit-specific sales/purchases of cleared MWs, and increases/decreases due to replacement capacity transactions

UCAP value of the portion of resource dedicated to RPM

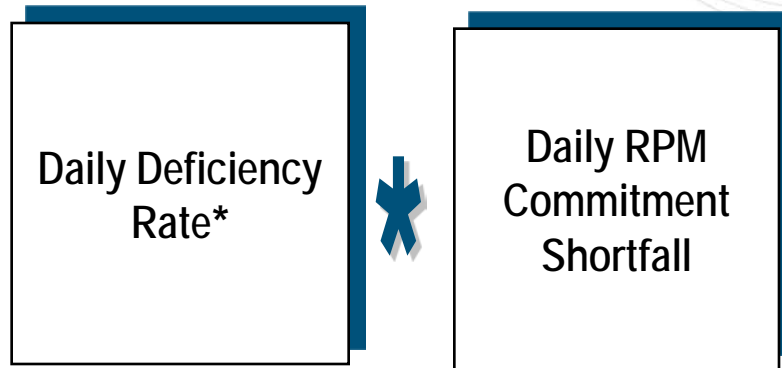
- RPM Commitment Compliance will be assessed daily during the Delivery Year
- If Final UCAP value of the EE resource is less than the UCAP committed, a Daily Capacity Resource Deficiency Charge will be assessed for the shortfall, unless replacement capacity is specified.
- If an Audit conducted during the Delivery Year reveals a UCAP value of the EE resource that is less than the UCAP value supported by M&V data, a Daily Capacity Resource Deficiency Charge will be assessed for any incremental shortfall retroactively from the start of the Delivery Year.

- PJM or independent third party may conduct a post-installation M&V Audit of the EE Resource, at the EE Resource Provider's expense, prior to or during the DY.
- If Audit is performed and results finalized prior to start of DY, the Nominated EE Value confirmed by the Audit becomes the PJM approved Final Nominated EE Value used to measure RPM Commitment Compliance during the DY.
- If Audit is performed and results finalized after the start of DY, the Nominated EE Value confirmed by the Audit becomes the basis to determine if any incremental RPM Commitment Compliance Shortfall needs to be assessed retroactively from June 1 of DY to May 31 of DY.
- PJM will provide documentation regarding cost of audit no later than 2 months after completion of the audit.
- M&V Audit Charges to be assessed no later than third billing month after completion of audit.

Daily RPM Commitment Shortage =



Daily Capacity Resource Deficiency Charge =



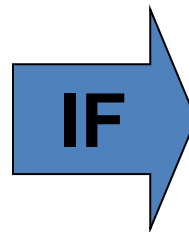
*Daily Deficiency Rate = Party's Weighted Average RCP + Higher of (20% * Party's Weighted Average RCP OR \$20/MW-day)

- Party's Weighted Average Resource Clearing Price (WARCP) for such resource is determined by calculating the weighted average of resource clearing prices for such resource, weighted by a party's cleared and makewhole MWs for such resource.
- If a Party's WARCP for such resource is \$0/MW-day, a PJM WARCP in the LDA is used.
- PJM WARCP is determined by calculating the weighted average resource clearing prices in the LDA across all RPM Auctions, weighted by the total cleared and make-whole MWS in the LDA.
- Charges are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation.
- The Resource Provider may still receive an RPM Auction Credit.

- Existing DR that cleared in BRA, 1st IA, or 2nd IA (effective 12/13 DY*) can receive relief from Capacity Resource Deficiency Charges if they failed to meet their RPM Resource Commitments due to a decrease in Peak Load Contributions that were due to permanent departure of load from the transmission system (e.g., plant closure or efficiency gains)
- Request for relief from deficiency charges must be made via email to rpm_hotline@pjm.com no later than two weeks in advance of opening the 3rd IA (effective 12/13 DY).
- The request for relief must provide PJM with adequate information for PJM to assess the merits of the request for relief.
- If relief is granted by PJM, the resource provider will receive a reduction in their Base Residual Auction Credits or Incremental Auction Credits

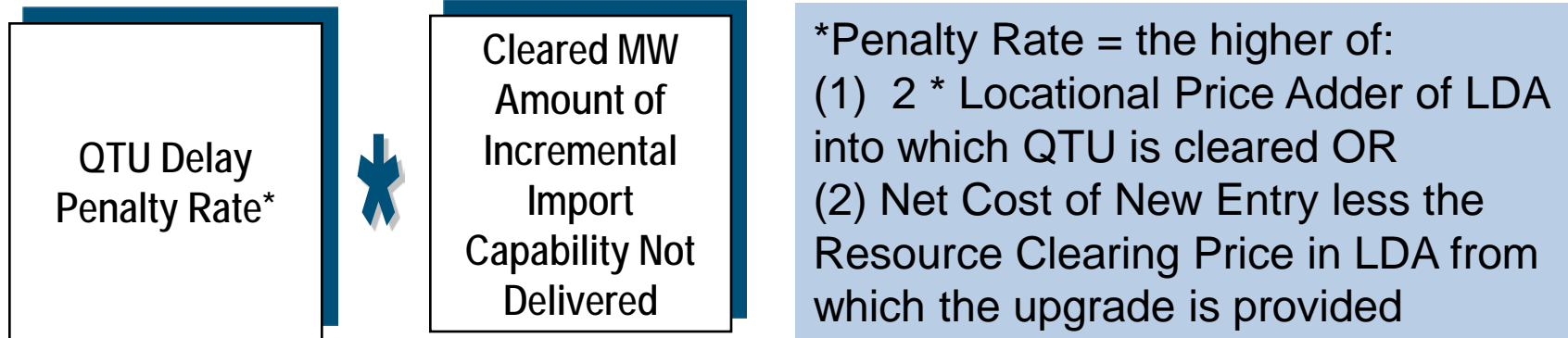
If Qualifying Transmission Upgrade (QTU) cleared in Base Residual Auction is not completed by start of Delivery Year and QTU was not replaced with an equivalent amount of Capacity Resources in the sink LDA, then the participant will pay a Daily Transmission Upgrade Delay Penalty for each day that the transmission upgrade is delayed in the Delivery Year.

Transmission Upgrade
Delay Penalty



Cleared MW
of Incremental
Import
Capability Not
Delivered on
Delivery Day

Transmission Upgrade Delay Penalty =



- Transmission Upgrade Delay Penalties are assessed daily and billed monthly.
- Penalties are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation.

- Since RPM Resource Commitments or FRR Capacity Plan Commitments on a unit can vary daily throughout the delivery year, a **Total Unit ICAP Commitment Amount** is calculated for each unit.
- **Total Unit ICAP Commitment Amount** is used as the basis for assessing the performance of a unit for *Peak-Hour Period Availability*, *Summer/Winter Capability Testing*, and *PSM Compliance*.

Total Unit ICAP Commitment Amount = the lesser of:

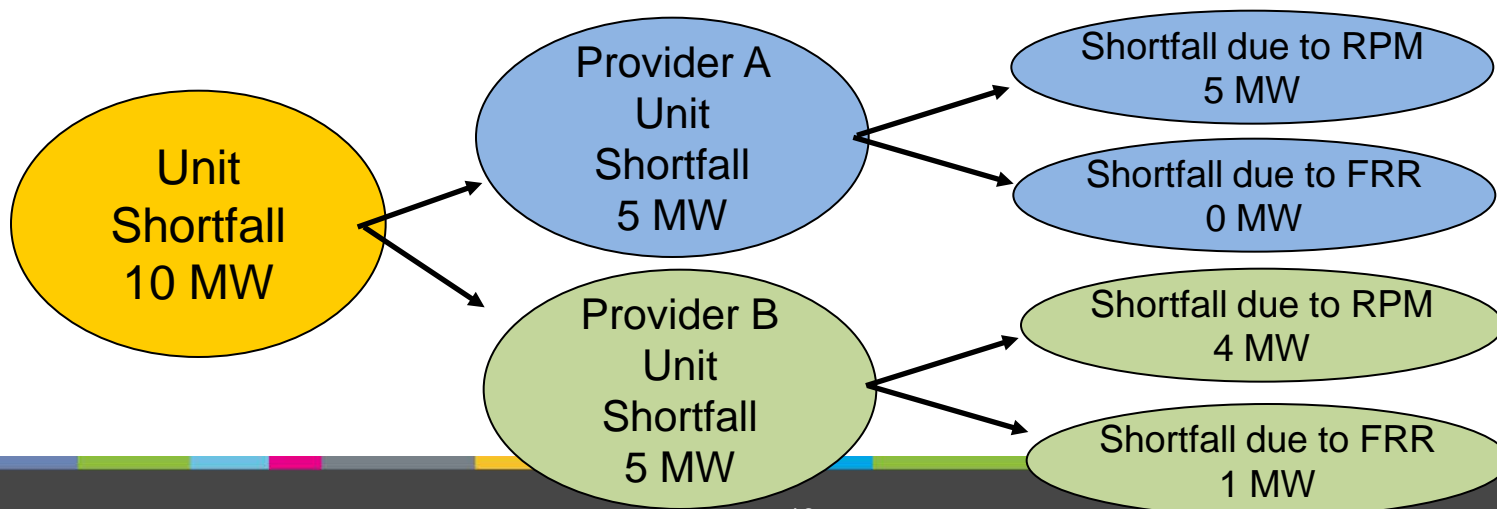
Unit Average Daily
ICAP Commitment
for DY

OR

Maximum
Summer Net
Dependable
Rating of Unit
During DY

Considers both
RPM & FRR
Commitments

- Assess performance for *Peak-Hour Period Availability, Summer/Winter Capability Testing, & PSM Compliance* at the unit level and determine a unit shortfall
- If multiple providers committed the unit, any unit shortfall will be divided pro-rata based on provider's share of Total Unit ICAP Commitment Amount
- If applicable, separate provider's shortfall on the unit into shortfalls due to RPM and shortfalls due to FRR



- Provides a means to assess whether committed generation resources are available at expected levels during critical peak periods
 - Credits or charges resource providers to the extent that they exceed or fall short of that expected availability.
- Provides generation owners an added incentive to ensure their capacity resources are available when they are most needed
- Provides LSEs with greater assurance that their payments for capacity will help maintain peak-hour period reliability.

- PJM will measure generation availability performance during peak load periods.
- The peak hour periods are defined based on summer and winter operating periods when high demand conditions are likely to occur.
- Defined Peak-Hour Periods:
 - Summer: June through August, hours ending 15:00 LPT through hour ending 19:00 LPT, on non-holiday weekdays
 - Winter: January and February, hours ending 8:00 LPT through 9:00 LPT and hours ending 19:00 LPT through 20:00 LPT, on non-holiday weekdays.
- Total number of hours is approximately 500 hours (can vary from year to year)

Calculate & Compare for each unit:

**Target
Unforced
Capacity
(TCAP)**

*Based on
EFORd-5*

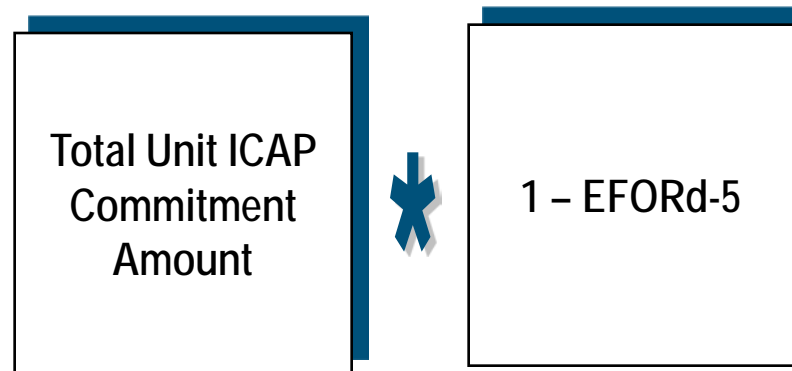
VS.

**Peak Period
Capacity
(PCAP)**

*Based on
EFORp*

- EFORd-5 determined based on 5 years of outage data through September 30 prior to the Delivery Year.
- Index similar to EFORd except that it is determined using 5 years instead of one year of outage data.
- Index calculated using GADs data.
- If unit does not have full 5 years of history, EFORd-5 will be calculated using class average EFORd and the available history.
- Class average EFORd will be used for a new generating unit.
- EFORd-5 is used to calculate Target Unforced Capacity.

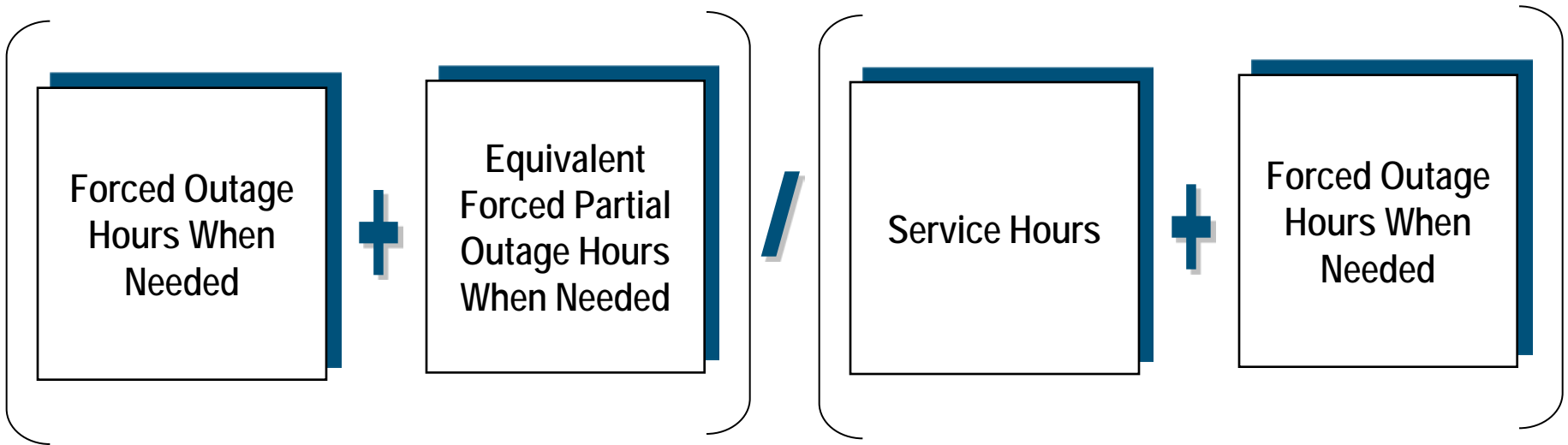
Target Unforced Capacity (TCAP) is calculated for each unit committed to either RPM or FRR and is equal to:



TCAP is the “target” used to measure the peak period availability of capacity from the generator in the Delivery Year. It may be different from the Delivery Year UCAP value.

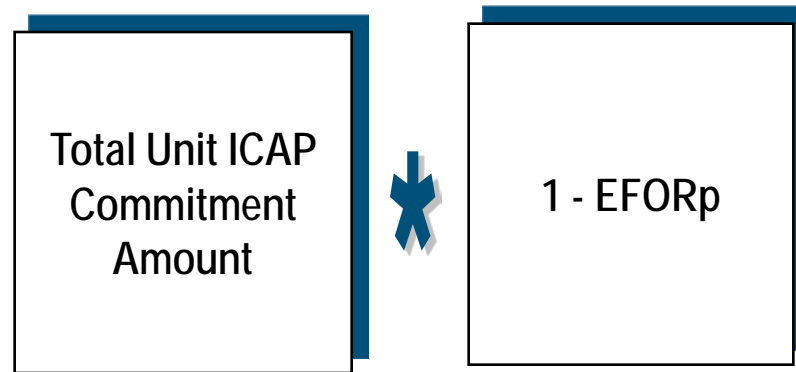
- EFORp determined using following sets of hours from the defined peak periods:
 - Forced outage hours when needed (outage hours exclude Outside Management Control (OMC) events)
 - Forced partial outage hours when needed (outage hours exclude OMC events)
 - Service hours
- “Outage hours when needed” determined by PJM by identifying hours during which the real-time LMP would have exceeded the cost-based offer for the unit or PJM would have (absent the outage) called the unit for operating reserves, taking into account the unit’s operating constraints.

EFORp =



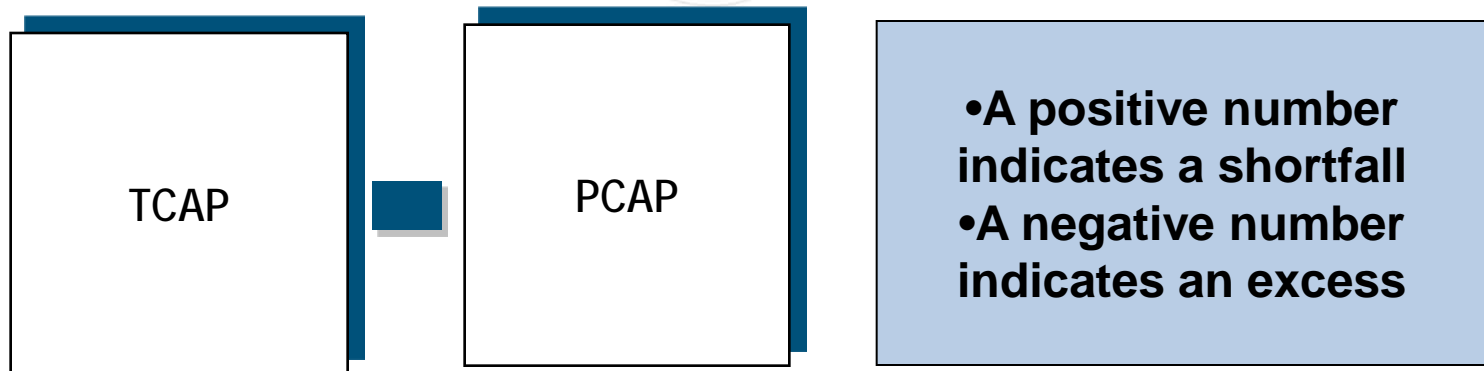
If service hours < 50 hours during the peak period, the EFORp will be set to the lesser of the calculated EFORp or the calculated EFORd (based on outage data that covers the entire Delivery Year).

Peak Period Capacity Available (PCAP) =



The Delivery Year PCAP of a unit is compared with the TCAP established prior to Delivery Year to determine a Peak Period Capacity Shortfall.

Peak-Hour Period Capacity Shortfall =



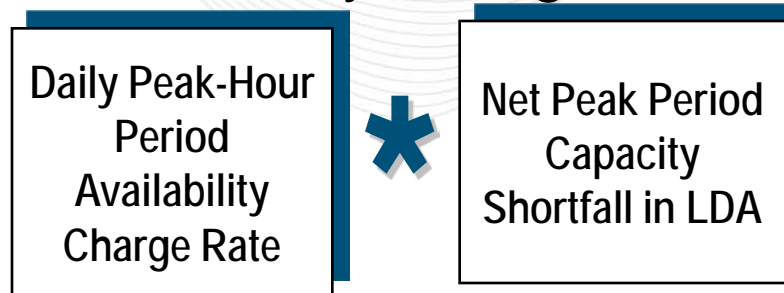
- Limited to 50% of Total Unit ICAP Commitment Amount * (1- Effective EFORd)
- If 50% limitation is triggered in a Delivery Year, the limit will increase to 75% the following Delivery Year.
- If 75% limitation is triggered in a Delivery Year, the limit will increase to 100% in the following Delivery Year.
- The 50% limit will be reinstated after 3 years of good performance.

Estimates of unit's EFORp and Peak Period Capacity Shortfall to be provided in December of Delivery Year.

- For each Resource Provider, the net of their Peak-Hour Period Capacity Shortfalls in an LDA are determined.
- The netting of Peak-Hour Period Capacity Shortfalls in an LDA is performed across committed units within a single account in eRPM. There is no netting of shortfalls across multiple accounts in eRPM.
- Excess available generation capacity in a party's account that satisfied the capacity resource obligations (satisfied DA Energy Market offer requirement and summer/winter testing requirement) may be used to reduce a Net Peak-Hour Period Capacity Shortfall in an LDA.
- The Net Peak-Hour Period Capacity Shortfall in an LDA is separated into shortfall due to RPM commitments and shortfall due to FRR commitments.
- The Net Peak-Hour Period Capacity Shortfall in an LDA is applied to each day in the DY.
- Resource Providers with a positive Net Peak Period Capacity Shortfall in an LDA will be assessed a Peak-Hour Period Availability Charge retroactively for each day in the DY.

Peak-Hour Period Availability is determined on a unit-specific basis; however shortfalls are netted across units in an eRPM account.

Peak-Hour Period Availability Charge =



- Rate Applied to Net Peak Period Capacity Shortfalls for RPM Commitments in an LDA is equal to the Provider's Weighted Average Resource Clearing Price in an LDA (\$/MW-day).
- Provider's Weighted Average Resource Clearing Price (WARCP) in an LDA is determined by calculating the weighted average of resource clearing prices in the LDA across all RPM Auctions, weighted by a party's cleared and makewhole MWs in the LDA.
 - Cleared MWs acquired or transferred through a Unit Specific Transaction for cleared capacity are accounted for in the calculation of Provider's WARCP.
 - Cleared MWs or Makewhole MWs in the LDA for wind, solar, DR or EE Resources are not considered in the calculation of Provider's WARCP.
- If Provider's WARCP is \$0/MW-day, a PJM WARCP in an LDA will be used.
 - PJM WARCP is determined by calculating the weighted average resource clearing prices in the LDA across all RPM Auctions, weighted by the total cleared and make-whole MWs in the LDA.
- Rate Applied to Net Peak Period Capacity Shortfalls for FRR Capacity Plan Commitments in an LDA is equal to the weighted average of resource clearing prices across all RPM Auctions for the LDA encompassing the zone of the FRR Entity, weighted by the quantities cleared in the RPM Auctions.

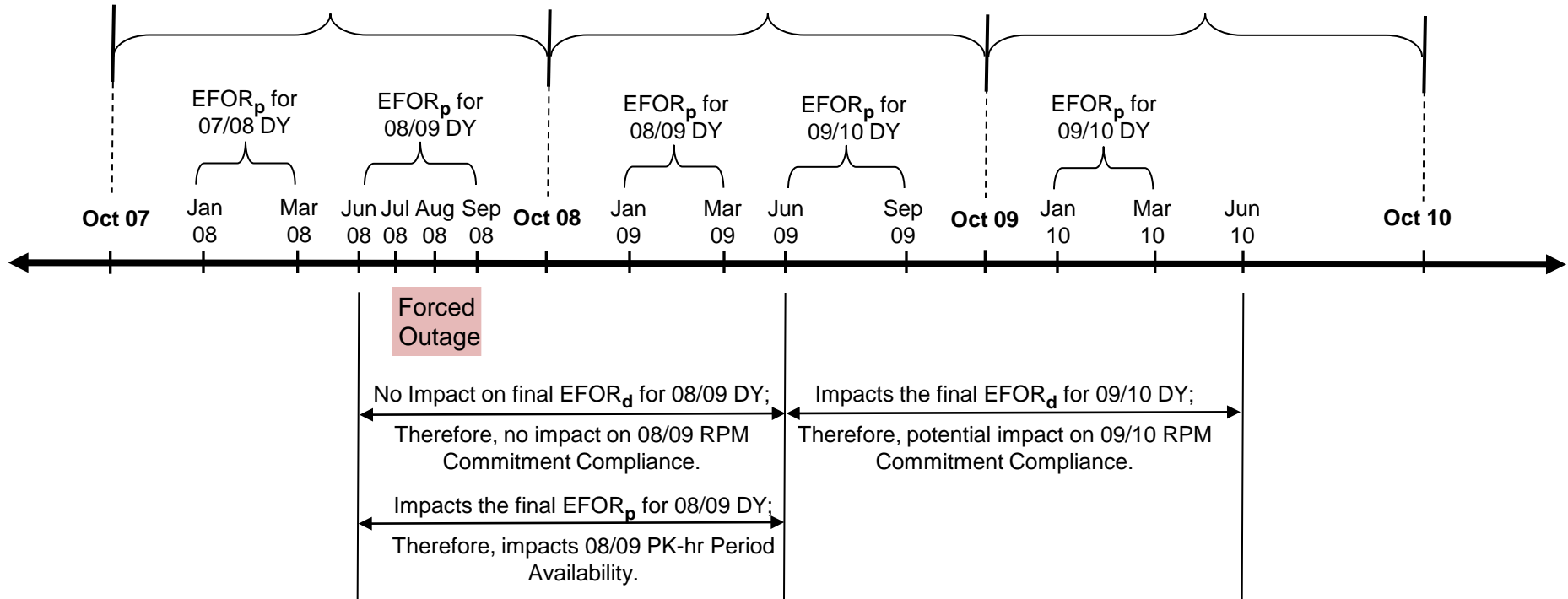
- Charges for RPM Resource Commitments are allocated to over-performing Resource Providers that have a negative Net Peak Period Capacity Shortfalls for RPM Commitments in LDA.
- Charges for FRR Capacity Plan Commitments are allocated to over-performing Resource Providers that have a negative Net Peak Period Capacity Shortfalls for FRR Capacity Plan Commitments in LDA.
- Amount allocated to over-performing Resource Provider is capped at their Net Peak Period Capacity Shortfall in the LDA times the Daily Peak-Hour Period Availability Charge Rate.

- Any remaining balance of Charges is allocated to LSEs in LDA who were assessed a Locational Reliability Charge and FRR Alternative LSEs in LDA that over performed (i.e., FRR LSEs with negative Net Peak Period Capacity Shortfalls).
- Allocations to LSEs are performed on a pro-rata basis based on the LSE's daily unforced capacity obligations.
- Charges and Credits are assessed daily and billed retroactively for the entire Delivery Year by the August bill (issued in September) after the conclusion of the Delivery Year.

EFOR_d for 09/10 DY & max
EFOR_d for 12/13 BRA

EFOR_d for 10/11 DY & max
EFOR_d for 13/14 BRA

EFOR_d for 11/12 DY & max
EFOR_d for 14/15 BRA

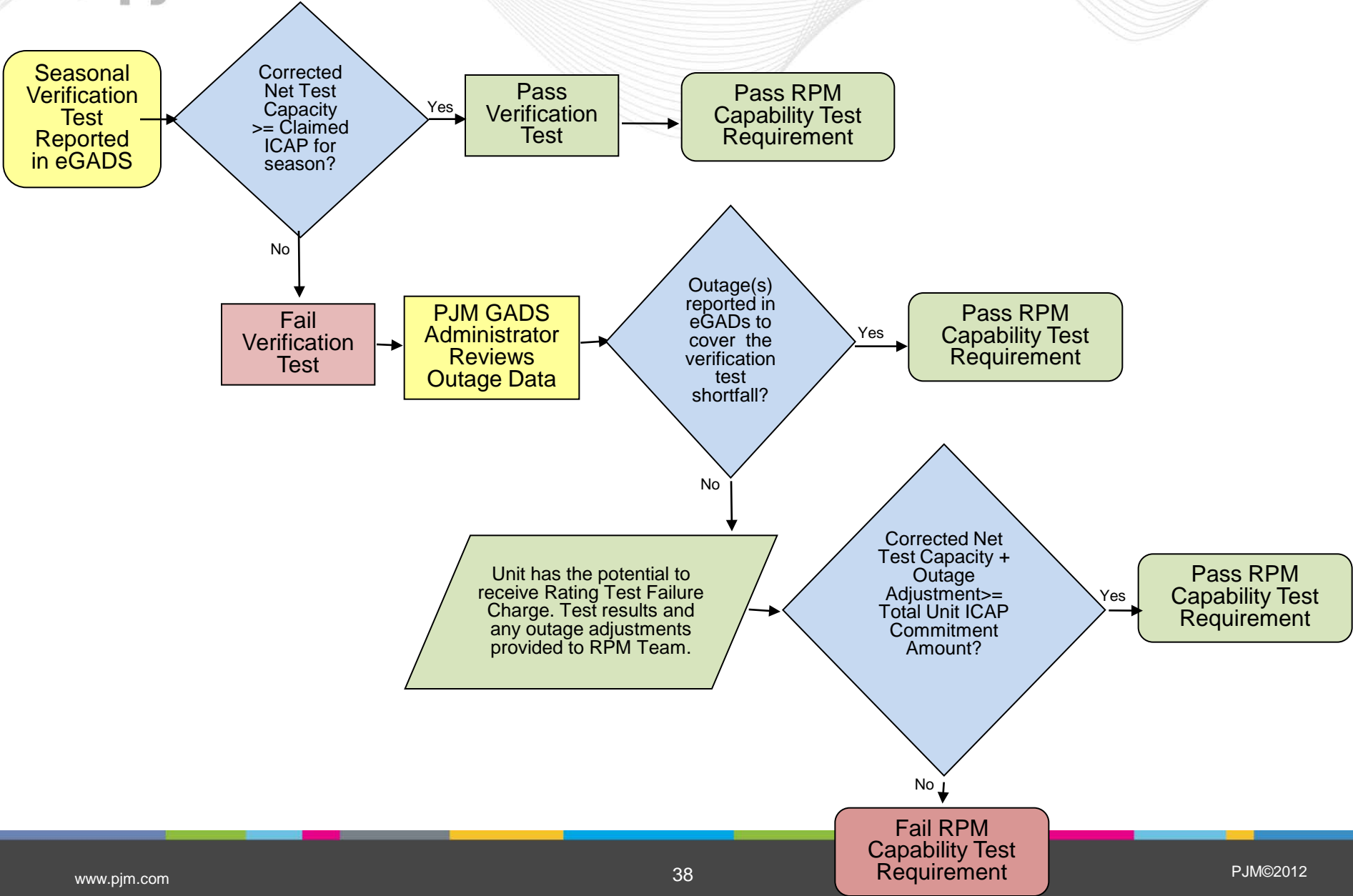


Questions?

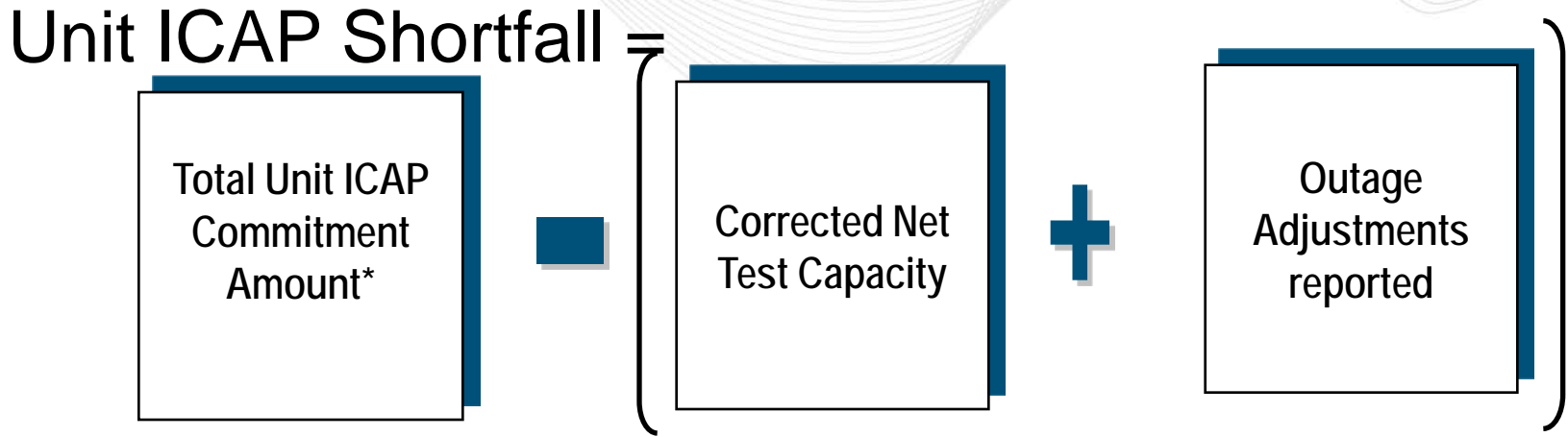
- During the DY, generation owners are responsible to perform Summer/Winter Net Capability Verification (i.e., Capability Testing) as described in PJM's Rules & Procedures for Determination of Generating Capability (M-21) and submit test results through the eGADS system.
 - Data collected during summer verification window may be used to satisfy winter test requirements after adjustments to the appropriate ambient Winter conditions.
- Purpose of net capability verification is to demonstrate the unit can achieve the claimed summer/winter net dependable rating of the unit.
- PJM will use the results of the summer/winter net capability verification to assess whether a unit that was committed to RPM or FRR Alternative was able to achieve at least the Total Unit ICAP Commitment Amount in the summer/winter capability test.

- Summer/Winter Net Capability Verification must be performed during both the Summer and Winter testing periods.
 - Summer test period: June – August
 - Winter test period: December – February
- Hydro generation can be tested any time during the DY, but is only required to perform testing once per year.
- If entire unit is on a forced or planned outage during the entire summer or winter testing period, the unit is expected to submit an out-of-period capability test when the outage ends.
- Intermittent generation is exempted from the testing requirement.

- Unlimited number of tests may be performed on unit during each testing period.
- If none of tests performed certify full delivery of the unit's Total Unit ICAP Commitment Amount, those parties with RPM Resource Commitments and FRR Capacity Plan Commitments from such unit may be subject to Generation Resource Rating Test Failure Charges.
- Unit's ICAP Shortfall for the testing period is determined by the test that resulted in the highest ICAP rating (i.e., the highest Corrected Net Capacity as described in PJM's Rules & Procedures for Determination of Generation Capability (M-21).



- Adequate outage reporting in eGADs can prevent a Rating Test Failure Charge
 - Outage(s) in an amount of the difference between Claimed ICAP & Corrected Net Test Capacity exists retroactive to start of test period and lasting until
 - Successful out-of-period test is conducted OR
 - Reduction in claimed ICAP of facility OR
 - Beginning of next test period
 - Outage(s) existed and were reported prior to the conduct of the test

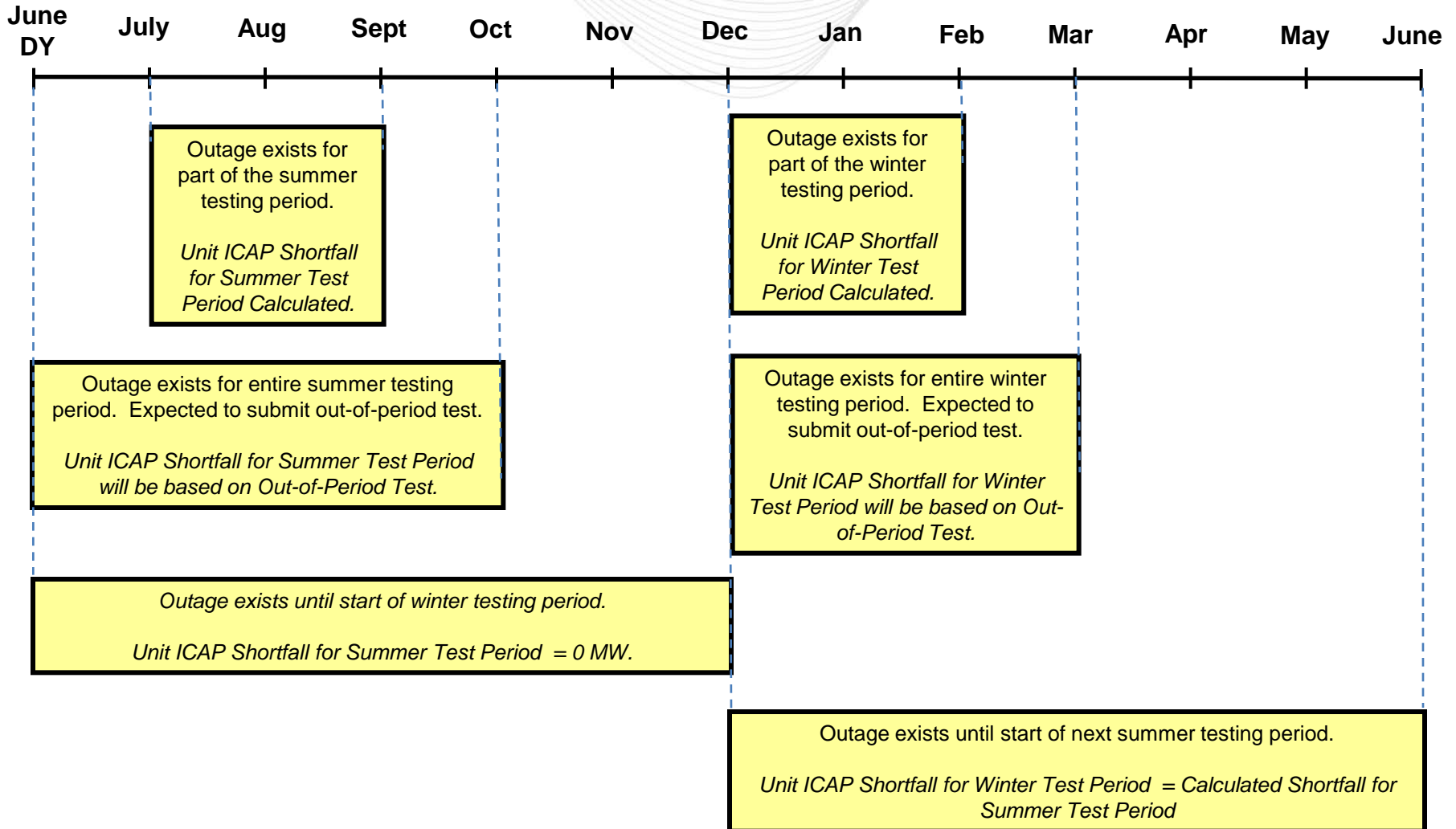


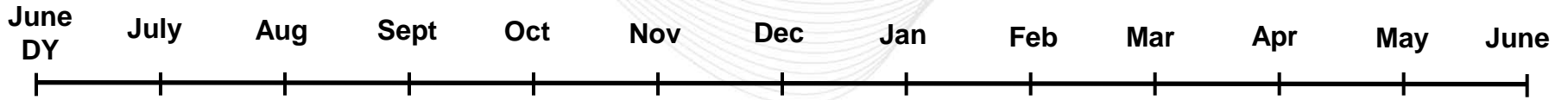
*** If Winter Rating on a unit < Summer rating on the unit and Total Unit ICAP Commitment Amount > Winter Rating, Winter Rating will be used in instead of Total Unit ICAP Commitment Amount in the calculation of Unit ICAP Shortfall for winter testing period.**

- A positive number indicates a failure to certify the Total Unit ICAP Commitment Amount.**
- A negative number indicates the Total Unit ICAP Commitment amount was exceeded.**

Shortfalls are assessed on a unit-specific basis. There is no netting of shortfalls across the units in a party's eRPM account.

Impact of Full Forced Outage or Planned Outage on Capability Testing





Unit ICAP Shortfall for Summer testing period	Unit ICAP Shortfall for Winter testing period
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Can never be less than Unit ICAP Shortfall for Summer testing period

Daily Unit ICAP Shortfall = 10 MW	Calculated Unit ICAP Shortfall for Winter testing period = 5 MW. Unit ICAP Shortfall for Winter testing period = 10 MW.
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Daily Unit ICAP Shortfall = 10 MW	Calculated Unit ICAP Shortfall for Winter testing period = 15 MW. Unit ICAP Shortfall for Winter testing period = 15 MW.
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A Resource Provider with a positive Daily Unit ICAP Shortfall will be assessed a Rating Test Failure Charge =

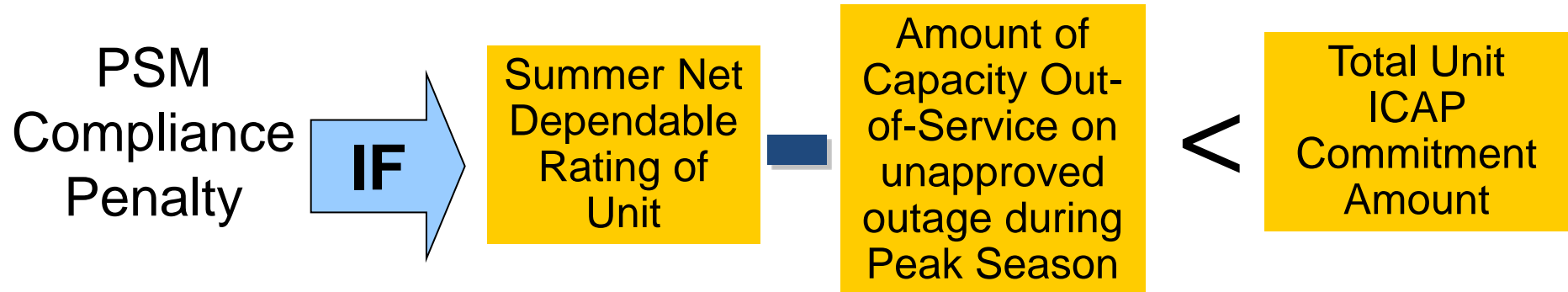


- DDR applied to Daily Unit ICAP Shortfall for RPM Resource Commitments = Party's Weighted Average Resource Clearing Price (WARCP) for such resource plus the higher of (0.2 * Party's WARCP for such resource OR \$20/MW-day)
- If Party's WARCP is \$0/MW-day, a PJM WARCP in an LDA will be used in the DDR.
- DDR applied to Daily Unit ICAP Shortfall for FRR Capacity Plan Commitments = 1.2 * weighted average resource clearing prices across all RPM Auctions for the LDA encompassing the zone of the FRR Entity, weighted by the quantities cleared in RPM Auctions.

- Generation Resource Rating Test Failure Charges are assessed daily.
- Charges are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation.
- Charges and credits are billed retroactively for the entire Delivery Year in the June bill (issued in July) after the conclusion of the Delivery Year.

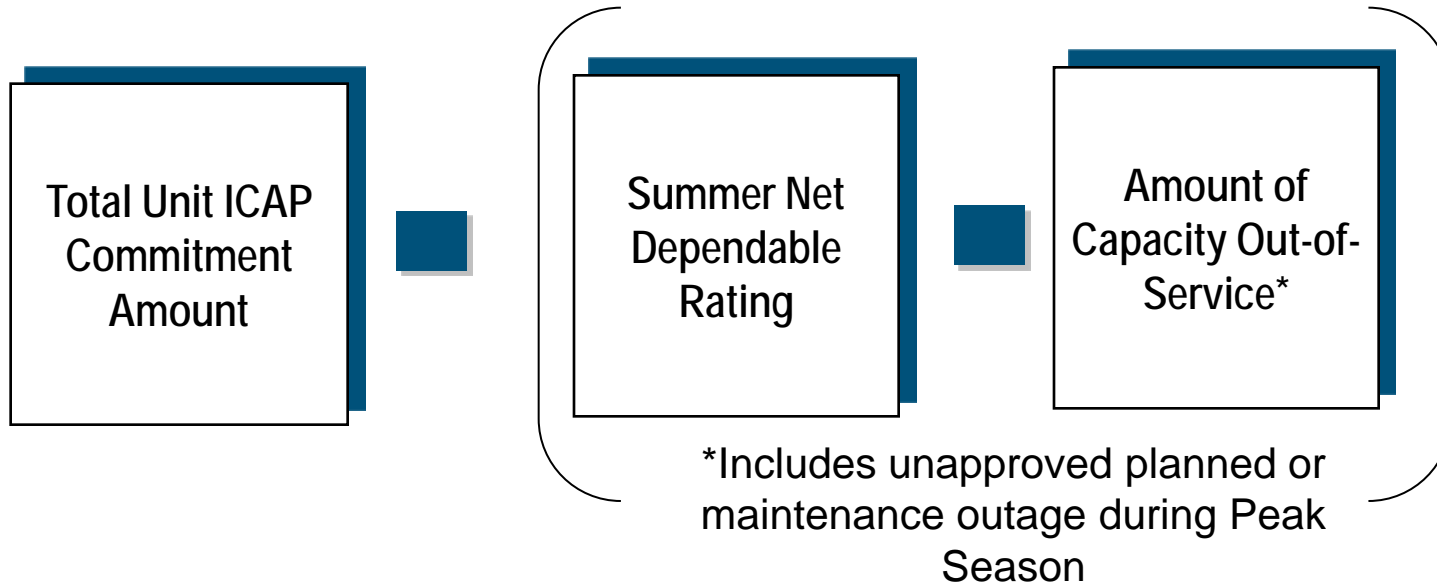
Questions?

- Peak Season Maintenance (PSM) Compliance is evaluated for each unit that was committed to RPM or FRR Alternative.
- If the unit was not available due to a planned or maintenance outage that occurred without the approval of PJM during the Peak Season, a Resource Provider may be assessed a PSM Compliance Penalty Charge.
- Peak Season – Weeks containing the 24th through 36th Wednesdays of the calendar year. All weeks start on a Monday and end on Sunday, except the week with the 36th Wednesday ends on a Friday.



PSM Compliance Penalty Charge assessed to parties that have RPM Resource Commitments or FRR Capacity Plan Commitments for such unit during the Delivery Year.

Unit PSM Compliance Shortfall =



If portions of unit were committed by multiple Resource Providers, a positive Unit PSM Compliance Shortfall is allocated to Resource Providers based on the provider's pro-rata share of the Total Unit ICAP Commitment Amount.

A Resource Provider with a positive Daily Unit PSM Compliance Shortfall will be assessed a PSM Compliance Penalty Charge =



- DDR applied to Daily Unit ICAP Shortfall for RPM Resource Commitments = Party's Weighted Average Resource Clearing Price (WARCP) for such resource plus the higher of (0.2 * Party's WARCP for such resource OR \$20/MW-day)
- If Party's WARCP = \$0/MW-day, a PJM WARCP in an LDA will be used in the DDR.
- DDR applied to Daily Unit ICAP Shortfall for FRR Capacity Plan Commitments = 1.2 * weighted average resource clearing prices across all RPM Auctions for the LDA encompassing the zone of the FRR Entity, weighted by the quantities cleared in RPM Auctions.

- PSM Compliance Penalty Charges are assessed daily for each day during the peak season that the resource is out-of-service on outage not approved by PJM .
- Charges are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation.
- Charges and credits are billed retroactively in the June bill (issued in July) after the conclusion of the Delivery Year.

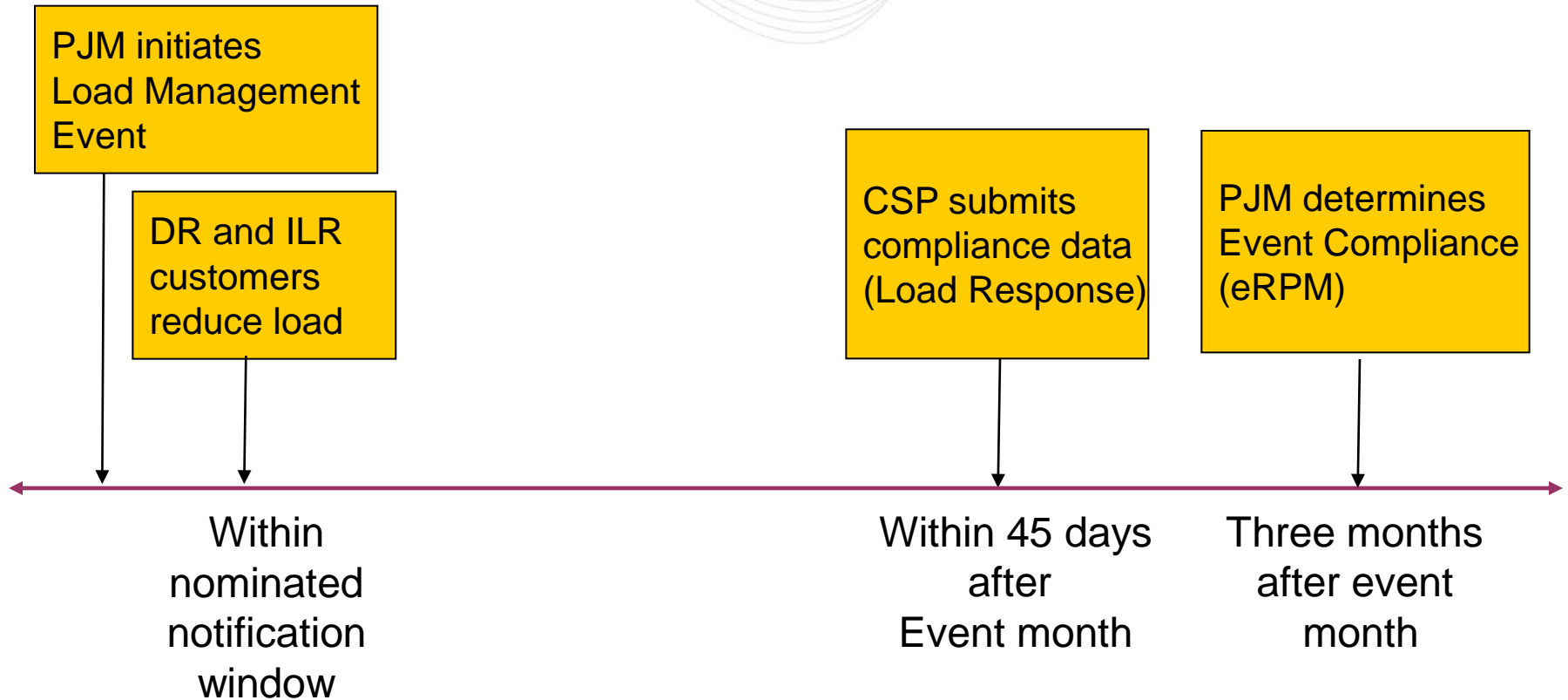
How does PJM avoid double-counting of Generation Performance Assessment Shortfalls?

- If RPM Commitment compliance shortfall occurs due to a unit delay, derate, or retirement, any daily Unit ICAP shortfall due to capability testing or PSM compliance (in case of derate) will be reduced by the daily ICAP value of RPM commitment compliance shortfall.
 - Daily Unit ICAP shortfall will not be reduced to a value less than zero.
- During time period unit is delayed or retired:
 - PSM compliance is not assessed
 - Forced outages are not reported; therefore, no impact on EFORp
- If summer/winter capability test resulted in a partial forced outage entered by PJM GADs administrator and a rating test failure charge was assessed, this partial forced outage is not considered in the determination of EFORp

- ✓ Forced outages in DY impact the unit's EFORd in subsequent DYs and may impact unit's ability to meet RPM Commitments in subsequent DYs.
- ✓ Forced outages in DY may impact the unit's EFORp for current DY and result in a positive Unit Peak Hour Period Capacity Shortfall.
- ✓ A Unit Peak Hour Period Capacity Shortfall (positive or negative) will be calculated if Total Unit ICAP Commitment Amount on a unit is greater than 0 MW.
- ✓ Net Peak Hour Period Capacity Shortfalls are applied daily for entire DY, not just during peak period
- ✓ Report outage data in eGADs properly to avoid a Rating Test Failure Charge

Questions?

- Resource Providers that have demand resources with RPM Resource Commitments, FRR Capacity Plan Commitments, or Certified ILR Resources are subject to compliance check performed after each PJM-initiated Load Management event that occurs during the months of June through September.
 - Effective 2014/2015 DY, compliance will be checked for on-peak period (all hours in definition of Limited DR) and for off-peak period (all hours specified in definition of Extended Summer DR or Annual DR, excluding on-peak period)
- Must submit customer-specific load reduction data into PJM's Load Response system within 45 days after the end of the month in which Load Management event occurred.
- Compliance data is sent to the eRPM System automatically, once the deadline for data submission has passed.



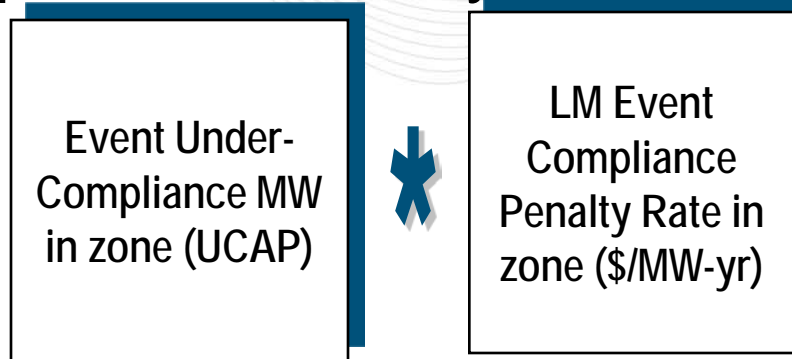
- For each CSP, compliance is determined by event and will be evaluated by zone, aggregating the compliance results of registrations that were dispatched
 - Registration(s) of a different product-type in same geographic location and lead time may be substituted for registration(s) that were dispatched if the registration(s) have a comparable load reduction commitment as the registration(s) that were intended for dispatch (effective with 2014/2015 DY)

LM Program	How is compliance measured?
Firm Service Level (FSL)	Compare load during event vs. firm service level
Guaranteed Load Drop (GLD)	Compare load dropped during the event to the nominated amount of load drop. LM Providers must submit actual loads and comparison loads. Comparison loads must be developed from the guidelines included in Attachment A of Manual 19, and note which method was employed.
Direct Load Control (DLC)	Compliance based on timing of control signal.

- For GLD, meter data submission has been expanded to include all 24 hours for event/test day and all 24 hours for any additional days as required by PJM to calculate load reduction.
- Compliance is averaged over the full hours of an LM event.
 - For example, if event starts at 12:15 and ends @16:45 then compliance will be measured from hours ending 14:00 through 16:00 for a total of 3 “full” hours.
- No compliance credit will be given for the incremental load drop below zero (i.e., exported energy).
- Compliance MW for a registered site = Nominated Load Reduction Value in eLRs – Actual Load Reduction
 - Nominated Load Reduction value is capped at RPM commitment on day of the event

- A net zonal compliance position will be determined for each CSP per event
- CSP's net zonal undercompliance in a zone will be reduced by CSP's relevant Capacity Resource Deficiency shortfalls on the day of the LM event
- Net zonal undercompliance in zone may be separated into undercompliance MWs for sub-zone and rest of zone.
- Net zonal under-compliance MWs will be associated with specific registrations that under-complied prior to billing.

LM Event Compliance Penalty Charge =



- Load Management Compliance Penalty charges are assessed to those CSP that under-complied during an event.
- Charges for Limited DR to be assessed on an event basis the third billing month after the event occurs (e.g., June events included in September bill issued in October)
 - Initial charges reflect charges due from June 1 to last day reflected in initial monthly billing. Remaining charges for such event assessed and billed monthly for remainder of year.
- Charges for Extended Summer DR & Annual DR charges to be assessed on an event basis after conclusion of DY. Assessed later of (1) June following the DY or (2) third billing month following the last event (*Effective with 2014/2015 DY*)
- Total Charges assessed for all events will be capped at Annual Revenues received by provider in DY.

LM Compliance Penalty Rate (\$/MW-yr) =

Lesser of (1/actual number of events during the summer period, or 50%) * Party's Weighted Daily Revenue Rate (\$/MW-yr) in such zone

- If Party's Weighted Daily Revenue Rate is \$0/MW-day (only committed DR resource through replacement capacity transaction or Locational UCAP transaction), a PJM Weighted Annual Revenue Rate for the zone will be used.

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)

- Charges for an event are allocated on a pro-rata basis to those CSPs that committed DR/ILR and provided load reductions in excess of the amount that they were obligated to provide for such event.
- Allocation to each over-performing CSP shall not exceed the volume of excess MWs provided during a single event times 0.2 times the Weighted Daily Revenue Rate.
- Remaining Penalty Charges not allocated to over performing providers are allocated to LSEs based on LSE's Daily UCAP Obligation.
- LM Event Compliance Penalty Credits for an event are allocated when charges are assessed.

- *In the absence of a PJM initiated LM event during the summer season, a LM Resource Test provides the means to assess whether or not a DR or ILR resource honored their commitments and provided the expected reliability services during the Delivery Year.*
- Incentivizes LM resource providers to perform through exposure to deficiency or penalty charges

Testing Requirement effective starting with the 2009/2010 Delivery Year

Testing requirement applies to:

- Committed DR Resources for DY
- Certified ILR Resources for DY

Portions of a resource that do not have an RPM Commitment or FRR Capacity Plan Commitment during the Delivery Year are not subject to RPM resource performance assessments and the associated deficiency/penalty charges.

- CSP is required to simultaneously test all their sites registered as Limited DR in a zone if PJM has not called an event for Limited DR in that zone by August 15 of DY
 - If PJM initiated a LM event for Limited DR in zone for long lead time resources only, CSP is required to test sites registered as short lead time, Limited DR in zone.
 - If PJM initiated a LM event for Limited DR in sub-zone only, CSP required to test sites registered as Limited DR in rest of zone.
- If a PJM-initiated LM event for Limited DR is called between August 16 and September 30 of DY, no test will be required
- If a PJM-initiated LM event for Limited DR is called between June 1 and September 30 of DY, LM test compliance will not be evaluated and LM Test Failure Charges will not be assessed for Limited DR.

Test required only if there is no PJM-initiated LM event for Limited DR in that zone for lead time type (i.e., long lead time, short lead time).

- CSP is required to simultaneously test all their sites registered as Annual DR in a zone if PJM has not called an event for Annual DR in that zone during the Delivery Year
 - If PJM initiated a LM event for Annual DR in zone for long lead time resources only, CSP is required to test sites registered as short lead time, Annual DR resources in zone.
 - If PJM initiated a LM event for Annual DR in sub-zone only, CSP required to test sites registered as Annual DR in rest of zone.
- If a PJM-initiated LM event for Annual DR is called during Delivery Year, no test will be required

Test required only if there is no PJM-initiated LM event for Annual DR in that zone for lead time type (i.e., long lead time, short lead time).

- CSP is required to simultaneously test all their sites registered as Extended Summer DR in a zone if PJM has not called an event for Extended Summer DR in that zone during June – October or May of the Delivery Year
 - If PJM initiated a LM event for Extended Summer DR in zone for long lead time resources only, CSP is required to test sites registered as short lead time, Extended Summer DR in zone.
 - If PJM initiated a LM event for Extended DR in sub-zone only, CSP required to test sites registered as Extended DR in rest of zone.
- If a PJM-initiated LM event for Extended Summer DR is called during June – October or May of Delivery Year, no test will be required

Test required only if there is no PJM-initiated LM event for Extended Summer DR in that zone for lead time type (i.e., long lead time, short lead time).

CSP notifies PJM of intent to test

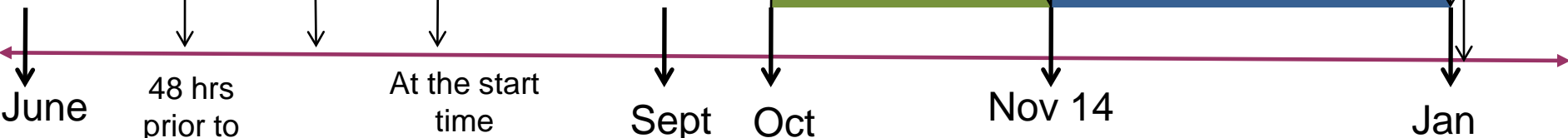
CSP initiates LM Test

DR and ILR customers reduce load

CSP submits test data in eLRS.

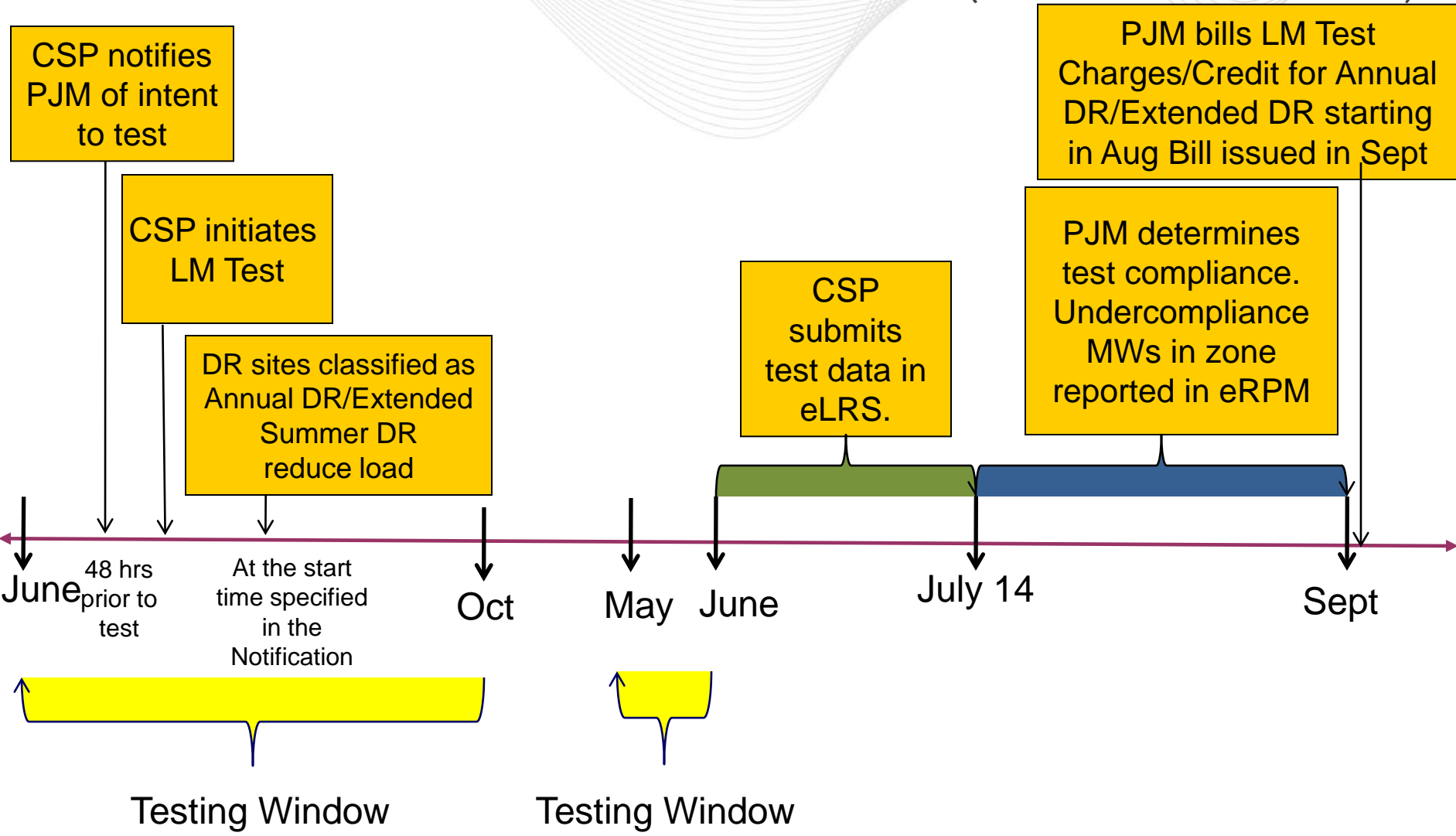
PJM determines test compliance. Undercompliance MWs in zone reported in eRPM

PJM bills LM Test Charges/Credit starting in Dec Bill issued in Jan



Testing Window

Annual DR/Extended Summer DR Test Timeline (Effective 2014/2015 DY)



- All of CSP's registrations for the same product type in the same zone are required to test at the same time for a 1 hour period during any hour when a PJM-initiated LM event for such product type would be called
 - Limited DR: 12:00 PM – 8:00 PM
 - Extended Summer DR/Annual DR: 10:00 AM – 10:00 PM
- Test must be conducted on a non-holiday weekday during the following testing periods:
 - Limited DR: June – September of DY
 - Extended Summer DR/Annual DR: June – October, May of DY
- Notify PJM of intent to test 48 hours in advance
 - Test and retest notifications must be submitted in eLRs
- No limit on the number of tests a CSP can perform
 - Only submit data for specific test that you want PJM to measure compliance

- If CSP failed to provide the required load reduction by product type in a zone by less than 25% of their Summer Average RPM Commitment by product type in a zone, the CSP can re-test the subset of failed resources.
- CSP may elect to maintain the initial test result of a failed resource if CSP notifies PJM 48 hours prior to a retest
- If no election is made to maintain the initial test result, the retest must be performed for all resources (i.e., end-use customer sites) in the zone that failed the initial test.
- Any resource affiliated with a failed resource must also participate in the re-test, even if it passed the in the initial test.
 - Affiliated resources are resources that have ability to shift load and are owned or controlled by the same entity.
- Re-test must be performed on comparable day (same time of day and under approximately the same weather conditions of original test)
- No limit on the number of re-tests a CSP can perform
 - Only submit data for specific re-test that you want PJM to measure compliance

INITIAL TEST and RE-TEST MUST BE COMPLETED BY SEPTEMBER 30 FOR LIMITED DR AND BY MAY 31 FOR ANNUAL DR OR EXTENDED SUMMER DR

- Test data must be submitted on or after Oct. 1 and by end of day Nov. 14 of the DY for Limited DR
- Test data must be submitted on or after June 1 and by end of day July 14 after the DY for Annual DR or Extended DR
- Only submit final test results and, if applicable, final “retest” results
- If initial test results are not submitted for a registration on-time then load reduction provided is 0 MW for such registration in the initial test
- If retest data is not submitted for entire subset of failed registrations and any affiliated registrations (with the exception of those registrations where CSP elected to maintain initial test data), CSP will not be eligible for re-test provisions and initial test results will be used for all registrations
- Test data will be submitted through eLRS system the same way emergency event compliance data is submitted
- For GLD registrations, meter data submission has been expanded to include all 24 hours for event/test day and all 24 hours for any additional days as required by PJM to calculate load reduction.

- Methods to measure test compliance for FSL, GLD, or DLC registrations are the same methods used to measure event compliance; however, in measuring test compliance, the Nominated Load Reduction Value in eLRs is capped at Summer Average RPM Commitment as opposed to RPM Commitment on day of event
- LM Test Compliance is measured over the hour of the test
- No compliance credit will be given for the incremental load drop below zero (i.e. exported energy).
- If CSP is eligible for re-test provision and re-test data is submitted for a subset of failed registrations in zone, re-test data will be used in determining final reduction for such registrations
- CSP test compliance is aggregated by Zone and product-type
- Net shortfall by zone and product type is determined by comparing the total zonal load reduction provided by registrations of the product-type to the Summer Average of Commitments for such zone and product-type
- Performance review of submitted test results will be completed by PJM between November 15 and December 31 during the DY for Limited DR and between July 15 and August 30 after the DY for Annual DR and Extended Summer DR

Net Testing Shortfall in zone for product-type =

Summer Avg RPM
Commitments in
zone for product-
type

Total MWs of
Load Reduction
provided by
registrations in
zone for
product-type

Summer Daily
Avg of Capacity
Resource
Deficiency
Shortfalls for
product-type

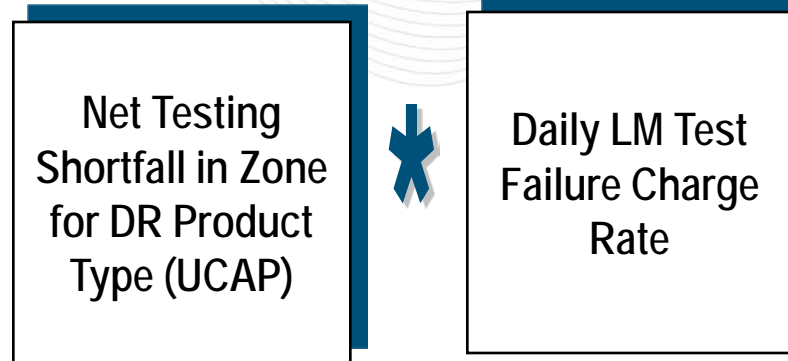
To avoid
double-
counting of
deficiencies

Includes both
RPM & FRR
Commitments

Shortfalls in ICAP will be converted to UCAP using final
DR Factor and FPR for DY.

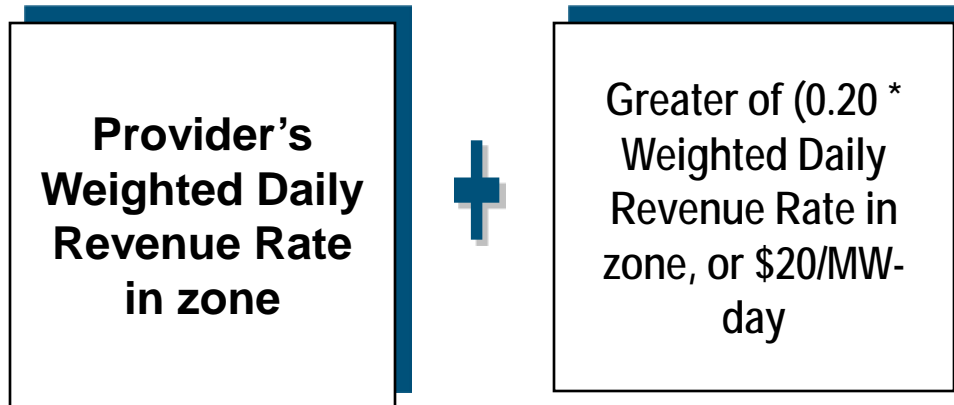
- A positive number indicates a shortfall
- A negative number indicates an excess

Daily LM Test Failure Charge =



- Load Management Test Failure Charges are assessed to a provider that under-complied in a zone for DR product type during a test.
- For Limited DR: Assessed daily and billed monthly; provided, however that a lump sum payment may be required to reflect amounts due, as a result of the testing failure, from the start of the DY to the day the charges are reflected in regular billing (December bill issued in January)
- For Annual DR/Extended Summer DR: Assessed daily and charged as a lump sum payment to reflect amounts due for the entire DY in the August bill issued in September after conclusion of the DY.
- Charges are allocated on a pro-rata basis to those LSEs who were charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation

Daily LM Test Failure Charge Rate =



- Provider's Weighted Daily Revenue Rate in a zone is determined by calculating the weighted average of resource clearing prices received across all RPM auctions by zonal DR resources and ILR prices received by zonal ILR resources, weighted by a MWs cleared (including any makewhole MWs) or MWs certified.
- Resource Provider still receives Daily RPM Auction Credit for DR resources or Daily ILR Credit for ILR resources.

Questions?

- Participants may specify replacement resources in order to avoid or reduce performance assessment shortfalls and associated deficiency/penalty charges.
 - Replacement Resources include:
 - Generation, DR, or EE Resources with Available ICAP
 - Cleared Buy Bids
 - Locational UCAP
 - Excess Commitment Credits
- Will be defined by both location and product type for 14/15 DY*
- Replacement Resource must meet similar locational requirements
 - Replacement Resource must meet same or better temporal availability characteristics (effective 2014/2015 DY).
 - Replacement capacity that is purchased to reduce a DR commitment must be acquired for the balance of the Delivery Year.

- Replacement resources for *resources committed to RPM* may be specified via the eRPM system by entering a “**Replacement Capacity**” transaction.
- “**Replacement Capacity**” transaction must be done after the EFORd for the DY has been locked in the eRPM system (November 30 prior to the DY), but before the start of the Delivery Day.
- Replacement resources for resources committed to FRR Capacity Plan is specified by an FRR Entity through the update of the FRR Entity’s FRR Capacity Plan prior to the start of the Delivery Day.
- ILR Resources may not be replaced through a replacement capacity transaction.

- Start date and end date of the replacement must be specified.
- Desired change in Daily RPM Resource Commitments (in UCAP terms) for resource being replaced and replacement resource must be specified.
- Change in Daily RPM Resource Commitments cannot result in a negative value for the Daily RPM Resource Commitments for the resource being replaced.
- Replacement resource must be located in the same LDA as the resource that is being replaced or reside in the Sink LDA of the QTU being replaced.
- Resources located in a constrained LDA can serve as replacement capacity for a resource located in less constrained parent LDA.
- Replacement resource must meet same or better temporal availability characteristics (effective 2014/2015 DY)

- Decreases the Daily RPM Resource Commitments for resource being replaced during the term of the transaction.
- Increases the Daily RPM Resource Commitments for a replacement generation, DR, or EE Resource during the term of the transaction.
- A change in Daily RPM Resource Commitments for a generation resource will result in a change in the Total Unit ICAP Commitment Amount for the generation resource.

- “Excess Commitment Credits” allocated to LDAs under certain conditions:
 - For 2010/11 -2011/12 DYs:
 - If the BRA RTO Reliability Requirement exceeds RTO Reliability Requirement calculated using the last updated forecast, this amount of excess will be allocated to LDAs.
 - For 2012/13 and beyond:
 - If the total amount from uncleared PJM IA Sell Offers exceeds the total amount of uncleared PJM IA Buy Bids, this amount of excess will be allocated to LDAs.
- The amount of excess is allocated among LDAs pro-rata based on the reduction for each such LDA in the peak load forecast from BRA to 3rd IA; provided:
 - Amount allocated to a LDA may not exceed the reduction in corresponding Reliability Requirement for such LDA.
 - Any LDA with an increase in its load forecast shall not be allocated any excess commitment credits.

- Excess Commitment Credits in an LDA are further allocated to LSEs in such LDA that are charged a Locational Reliability Charge.
- Allocation based on Daily UCAP Obligation of LSEs as of June 1 of DY and shall be constant for the entire DY.
- Excess Commitment Credits may be used as replacement capacity.

- ✓ Specify adequate amounts of replacement capacity to avoid performance assessment shortfalls and associated deficiency/penalty charges
- ✓ If desire to cover commitments with available capacity in your portfolio, submit replacement capacity transactions prior to 3rd IA. Any available capacity at time of 3rd IA will be required to offer into the auction.
- ✓ Replacement capacity transactions will result in a change to the Total Unit ICAP Commitment Amounts of the both the generation resource being replaced and the generation replacement resource.
- ✓ If looking to purchase replacement capacity, the Capacity Postings screen in eRPM is available to publicly post requests to buy or offers to sell capacity

Questions?