

Comparability of Capacity Resources Detailed Review

Capacity Senior Task Force
June 26, 2013

Rank	Item	Total Points*
1	Product Definition/Type	382
2	Market Obligation	292
3	Dispatch	204
4	Capacity Value (UCAP)	157
5	Performance Penalty	131

*A ranking of 1 was given 5 points, a ranking of 2 was given 4 points, a ranking of 3 was given 3 points, and so on.

1. Capacity Market Participation

1. Product Definition/Type
2. Capacity Value (UCAP)

2. Market Obligation for cleared capacity resource

1. Market Obligation
2. Dispatch

3. Compliance/Penalties

1. Performance penalties

	Generation	Demand Resources
Capacity Market Participation		
Product Definition/Type	One product: Annual	Three Products: Annual DR: all year; all days; 10 hours Extended Summer DR: May to Oct; all days; 10 hours Limited DR: June to Sept; weekdays; 6 hours; 10 calls
Capacity value (UCAP)	Unit specific forced outage based on previous 12 months. $UCAP < ICAP$	DR Factor * Forecast Pool Requirement. $UCAP > ICAP$

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- Available to produce energy throughout the Delivery Year
 - Unless on planned or forced outage



Qualifications for Offering Generation Resources

Qualification	Existing Internal	Existing External	Planned Internal (includes upgrades to existing units)	Planned External (includes upgrades to existing units)
Deliverability	Pre-certified by PJM as meeting generation deliverability test.	<p>Indication of intended ATC path to deliver external capacity is provided at time of offer.</p> <p>Firm transmission service from unit to border of PJM needs to be obtained by start of DY.</p> <p>Deliverability demonstrated prior to start of DY by either (1) obtaining firm PTP transmission service on PJM OASIS from border into PJM; or (2) obtaining "Network External Designated" transmission. Either option (1) or (2) may require transmission upgrades to be completed prior to June 1st of DY.</p>	<p>Unit is participating in RTEPP.</p> <p>Start date of Interconnection Service is on or before start of DY.</p> <p>Impact Study Agreement has been executed for unit to participate in BRA.</p> <p>Interconnection Service Agreement (ISA) executed for unit to participate in IA.</p>	<p>Same deliverability requirements as "Existing External" generation.</p> <p>Start date of Interconnection Service is on or before start of DY.</p> <p>Functionally equivalent System Impact Study Agreement has been executed with applicable TO/TP for unit to participate in BRA.</p> <p>Functionally equivalent Interconnection Service Agreement (ISA) executed for unit to participate in IA.</p>



Qualifications for Offering Generation Resources (Cont'd)

Qualification	Existing Internal	Existing External	Planned Internal (includes upgrades to existing units)	Planned External (includes upgrades to existing units)
Letter of Non-recallability	NA	X	NA	X
Unit resides in eRPM resource portfolio of a signatory of PJM Operating Agreement	Accomplished through a "Approved" CAP MOD or unit-specific bilateral transaction.	Accomplished through a "Provisionally Approved" unit-specific transaction with "External Party" as Seller. ("Approved" status granted when all generation deliverability requirements satisfied.)	Accomplished through a "Provisionally Approved" CAP MOD. ("Approved" status granted once unit or upgrade is commercial.)	Same requirements as "Existing External" generation.
Relevant portion of unit not specified in FRR Capacity Plan for DY.	X	X	X	X
Historical NERC/GADS unit performance data is provided in PJM format	PJM already has data in eGADs to establish EFORD & EFORD-5 yr.	5 years of historical data is requested.	Class average data or 5 yrs of historical data (if upgrade) will be used to establish EFORD & EFORD-5 yr.	Class average data or 5 yrs of historical data (if upgrade) will be used to establish EFORD & EFORD-5 yr.
Applicable Credit has been posted with PJM.	NA	Only required if deliverability requirements have not been met yet.	X	X

Qualifications for Offering Generation Resources (Cont'd)

Qualification	Existing Internal	Existing External	Planned Internal (includes upgrades to existing units)	Planned External (includes upgrades to existing units)
Operating and maintenance information submitted in eDART and eGADs.	X	X	X (once operational)	X (once operational)
Owner/operator performs summer and winter net capability tests.	X	X	X (once operational)	X (once operational)
Communication path is established between PJM dispatchers and unit operator.	X	X	X (once operational)	X (once operational)

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
Minimum Duration of Interruption	2 Hours	2 Hours	2 Hours
Notification	Must be able to reduce load when requested by PJM All Call system within 2 hours of notification, without additional approvals required		
Registration in eLRS	Must register sites in Emergency Load Response Program in Load Response System (eLRS)		

Generation	DR
<ol style="list-style-type: none"> 1. One product (Annual). 2. Availability is flexible in non-summer months (planned outages may be scheduled). Less flexibility in summer months (penalty for unapproved planned outages). 3. Summer and Winter Peak-Hour Period Availability Penalty (EFORp). 	<ol style="list-style-type: none"> 1. Three products based on expected availability. 2. Must be available in summer months. Availability flexible in non-summer months (Annual DR can be on approved maintenance). 3. Event Compliance Penalty.

Penalties designed based on availability requirements

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1. Performance penalties

Resource Type	Capacity Value
<p>Generation Resource</p>	<p>Summer Net Dependable Rating, converted to <u>Unforced Capacity (UCAP)</u></p>
<p>DR, & EE Resources</p>	<p>UCAP Equivalent is calculated (based on load reduction amount, Forecast Pool Requirement (FPR), DR Factor)</p>

Calculated based on Unforced Capacity (UCAP)

Unforced Capacity (UCAP) value of a generating unit is calculated as:

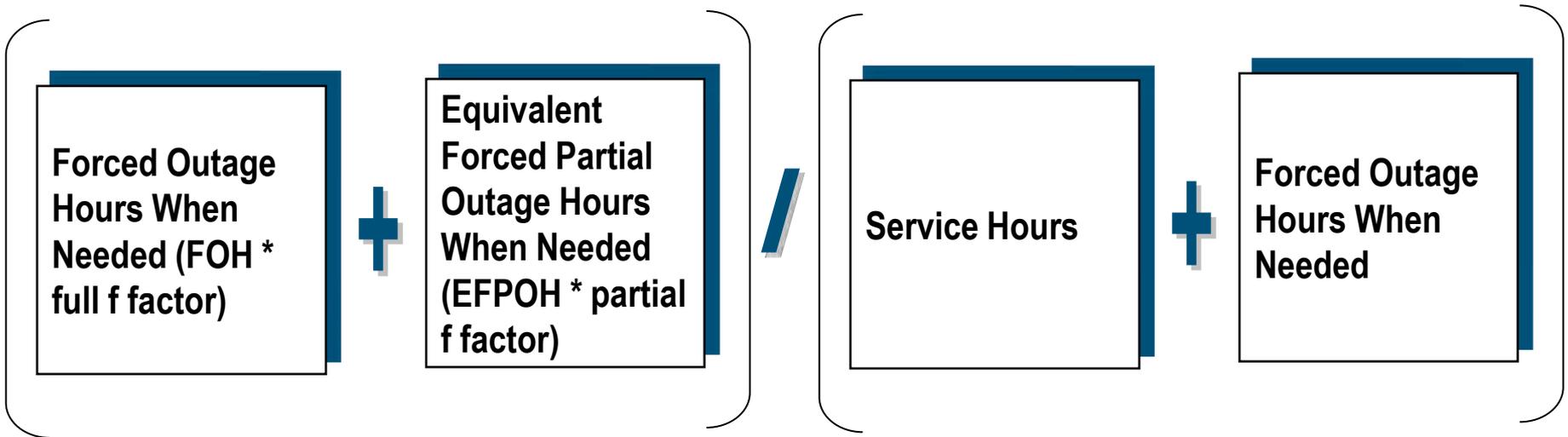
$$\text{Unforced Capacity Value of Unit X} = \text{SUMMER Installed Capacity (ICAP) Rating} * (1 - \text{EFORd}^*)$$

For Example:

$$95 \text{ MW} = 100 \text{ MW} * (1 - .05)$$

* Equivalent Forced Outage Rate (EFORd) for 12 months period ending September 30 prior to the Delivery Year is used for determining the final UCAP value for the Delivery Year.

EFORd =



Full f factor and partial f factor are calculated from the historical outage data.

UCAP Value of Load Management Products

Unforced Capacity (UCAP) value of a Load Management Products is calculated as:

$$\text{Unforced Capacity Value Of DR X} = \text{Nominated DR Value} * \text{DR Factor} * \text{Forecast Pool Requirement (FPR)}$$

For Example:

$$104.1 \text{ MW} = 100 * 0.955 * 1.0902$$

DR Factor and FPR posted with 3rd Incremental Auction Parameters are used to determine the UCAP value for the Delivery Year.

- The Nominated Value is the maximum load reduction of an end-use customer site.
- This determination uses the same PLC used to determine the capacity obligation for the customer.

Load Management Product Type	Nominated Value
Direct Load Control	$\# \text{ Customers} * \text{ Per Participant Impact} * \text{ Loss Factor}$ <i>Load Research and Switch Operability Study must be submitted to PJM and approved in order to determine the Per Participant Impact.</i>
Firm Service Level	$\text{Peak Load Contribution} - (\text{Firm Load Level} * \text{ Loss Factor})$
Guaranteed Load Drop	$\text{Min} (\text{Peak Load Contribution}, \text{ Customer Load Reduction Value} * \text{ Loss Factor})$

The maximum load reduction for each resource is adjusted to include system losses.

- The DR Factor represents the reliability value of 1 MW of Nominated DR Value. The value is around 0.95.
- DR Factor is calculated based on increase in PJM peak load carrying capability for given Nominated DR Value
- Nominal DR Value of end-use customer is based on PLC which is consistent with forecast peak load (50/50 forecast)
- DR Factor covers the risk that the actual load of end-use customer exceeds PLC making it difficult for customer to achieve full Nominal DR Value
- **Example:**
- Base case peak load at LOLE of 1-in-10 = 145,000 MW
- Annual DR of 14,000 MW is added as 100% available resource and peak load is calculated at LOLE of 1-in-10 as 158,300 MW
- Increase in peak load carried = $158,300 - 145,000 = 13,300$ MW
- DR Factor = $13,300 / 14,000 = 0.95$

- Assume a 100 MW amount of Nominated DR. That 100 MW of DR can satisfy the capacity obligation of 95 MW of load at a “1 in 10” reliability level.
- Absent DR and assuming an FPR of 1.09, that 95 MW of load would require $(95 \text{ MW} * 1.09) = 103.55 \text{ MW}$ of UCAP. Therefore, the 100 MW amount of Nominated DR has displaced the need for 103.55 MW of UCAP.
- The UCAP equivalent of 100 MW of Nominated DR is:
- $100 * 0.95 * 1.09 = 103.55 \text{ MW}$

Generation	DR
UCAP = Rating of physical unit discounted by unplanned outages (EFORd)	UCAP = Nominated Demand Reduction Value below amount of capacity reserved for customer (PLC) + grossed up for line losses - discounted by difference in load forecast vs. potential higher load (DR Factor multiplier) + grossed up for reserve margin requirement (FPR multiplier)

Penalties designed based on availability requirements

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	Generation	Demand Resources
Market Obligations for Cleared Capacity Resources		
Market Obligation	Submit day-ahead energy market offer or report an outage each day in DY. Provide MWs if cleared in DA or dispatched in RT. Telemetry/SCADA needed.	Submit zonal by lead time resource capability for each day (frequency of reporting increases based on system conditions). Provide MWs if dispatched under emergency conditions for required product availability period. Interval metering, no telemetry/SCADA. Limited DR- June to Sept; weekdays; 6 hours; 10 calls Extended Summer DR- May to Oct; all days; 10 hours Annual DR- all year; all days; 10 hours
Dispatch	Dispatched based on availability and DA must-offer price based on security constrained economic dispatch by node. May be dispatched on frequent basis for transmission constraints. Generation dispatch typically provides incremental operating margin based on well understood cost concepts. Cannot report a planned outage unless approved by PJM.	Dispatched based on emergency administrative procedures (when expected to be short on reserves) where CSP provided energy strike price (most at Max allowed energy market price) is not based on specific costs and may result in operating losses for the DR resource. Required to be available during on peak availability window (cannot report outage). Typically dispatched by zone or area, and not dispatched by registration. Typically not dispatched on frequent basis because only available during emergency conditions.

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Generation	DR
Submit Day Ahead energy market offer subject to specific cost rules.	Be available to reduce load during all On peak hours.
Report planned and forced outages.	Report planned outages during off peak hours.
Install appropriate telemetry.	Install appropriate interval metering and provide to PJM.

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Generation	DR
Dispatch by unit.	Dispatch by zone or by subzone and/or by product (subject to specific rules).
Based on unit specific offer prices and security constrained economic dispatch.	Administrative procedures during Emergency conditions (expect to be low on reserves).
Each unit defines start up time and availability.	Must respond within 2 or 1 hour. Must be available for all On Peak hours. Ability to schedule outage during off peak.

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 - 1. Performance penalties**

	Generation	Demand Resources
Compliance/ Penalties		
Performance Penalty	<p>EFORd - poor performance will devalue capacity that may be offered in next DY. (Unit specific measure).</p> <p>EFORp - evaluates unit availability during peak hours. Actual availability is compared to expected availability based on 5yr outage rate. Penalty for shortfall capped at 50% in first year, 75% second year and 100% in third year.</p> <p>Generation can net performance on an LDA basis within the portfolio for EFORp only.</p>	<p>Function of DR product availability.</p> <p>On-peak: $1/\#events * Revenue$ with max of 50% for no performance on 1 event.</p> <p>Off-peak: $1/52 * Revenue$. DR may report outages and therefore not have to respond.</p> <p>DR can net performance on a Zonal basis within a portfolio.</p>

Applicability of Assessments by Resource Type

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.

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 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 reduced load during a CSP-initiated test

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 - 1. Performance penalties – Peak-Hour Period Availability**

- 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*

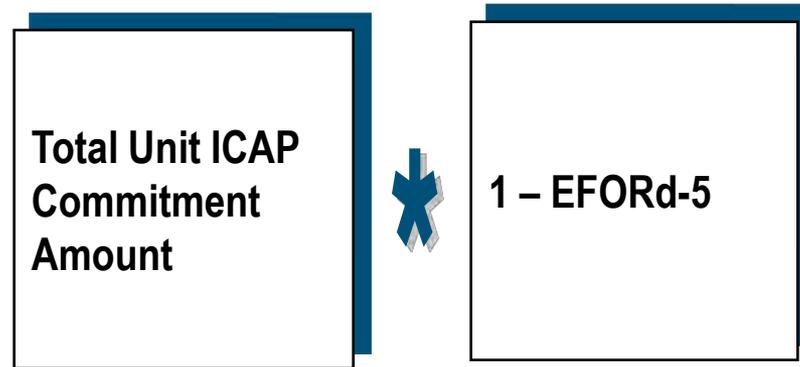
VS.

**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.

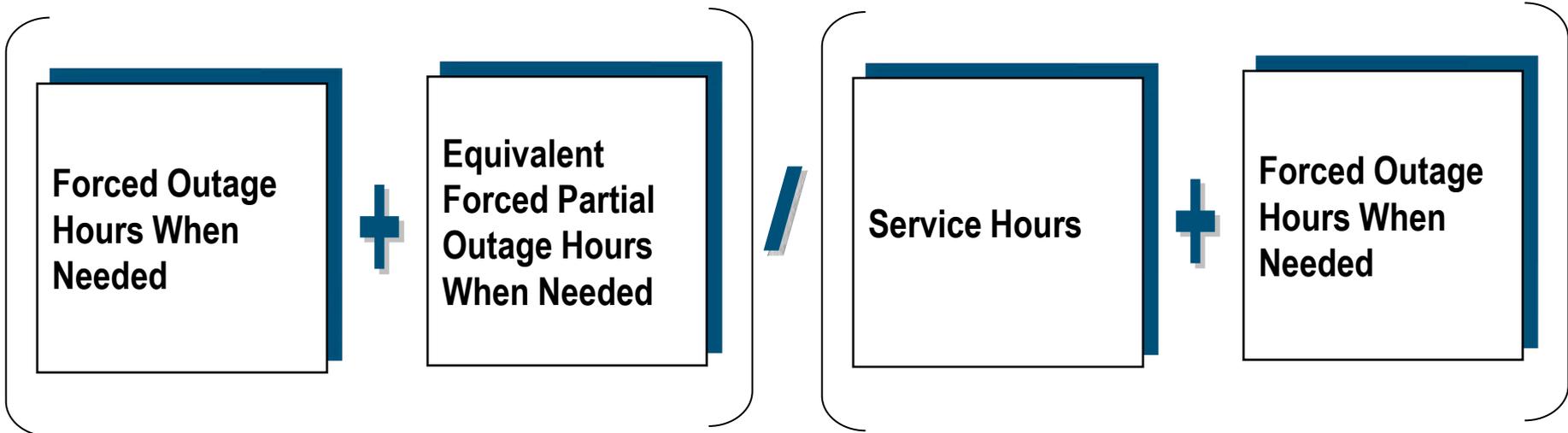
Target Unforced Capacity (TCAP) is calculated for each unit committed to either RPM or FRR and is equal to:



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.

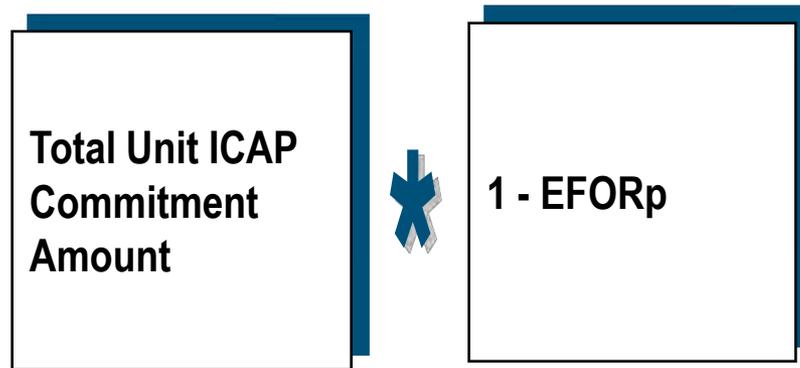
- EFORp determined using following sets of hours from the defined peak periods:
 - Forced outage hours when needed (outage hours exclude Outside Management Control (OMC) events)
 - Forced partial outage hours when needed (outage hours exclude OMC events)
 - Service hours
- “Outage hours when needed” 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 =



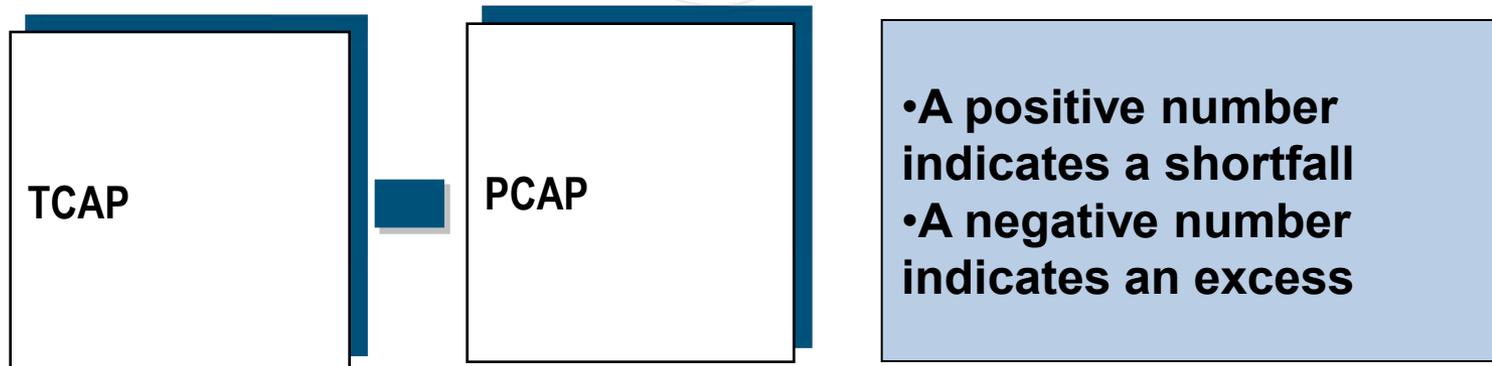
If service hours < 50 hours during the peak period, the EFORp will be set to the lesser of the calculated EFORp or the calculated EFORd (based on outage data that covers the entire Delivery Year).

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.

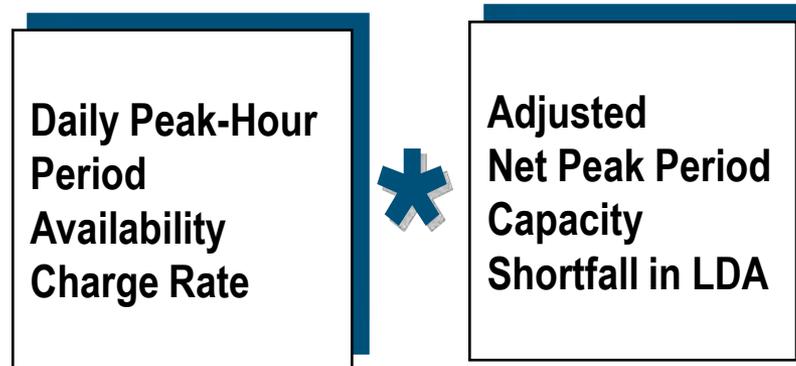
Estimates of unit's EFORp and Peak Period Capacity Shortfall to be provided in December of Delivery Year.

- 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.

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

- 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.
 - It may not be used to create a negative or more negative Net PHP Capacity Shortfall in an LDA (representing overperformance).
- This Adjusted Net Peak-Hour Period Capacity Shortfall in an LDA is separated into shortfall due to RPM commitments and shortfall due to FRR commitments.
- The Adjusted Net Peak-Hour Period Capacity Shortfall in an LDA is applied to each day in the DY.
- Resource Providers with a positive Adjusted Net Peak Period Capacity Shortfall in an LDA will be assessed a Peak-Hour Period Availability Charge retroactively for each day in the DY.
- Providers with a negative Adjusted Net Peak Period Capacity Shortfall in an LDA may share in the allocation of PHPA Charges.

Daily Peak-Hour Period Availability Charge =



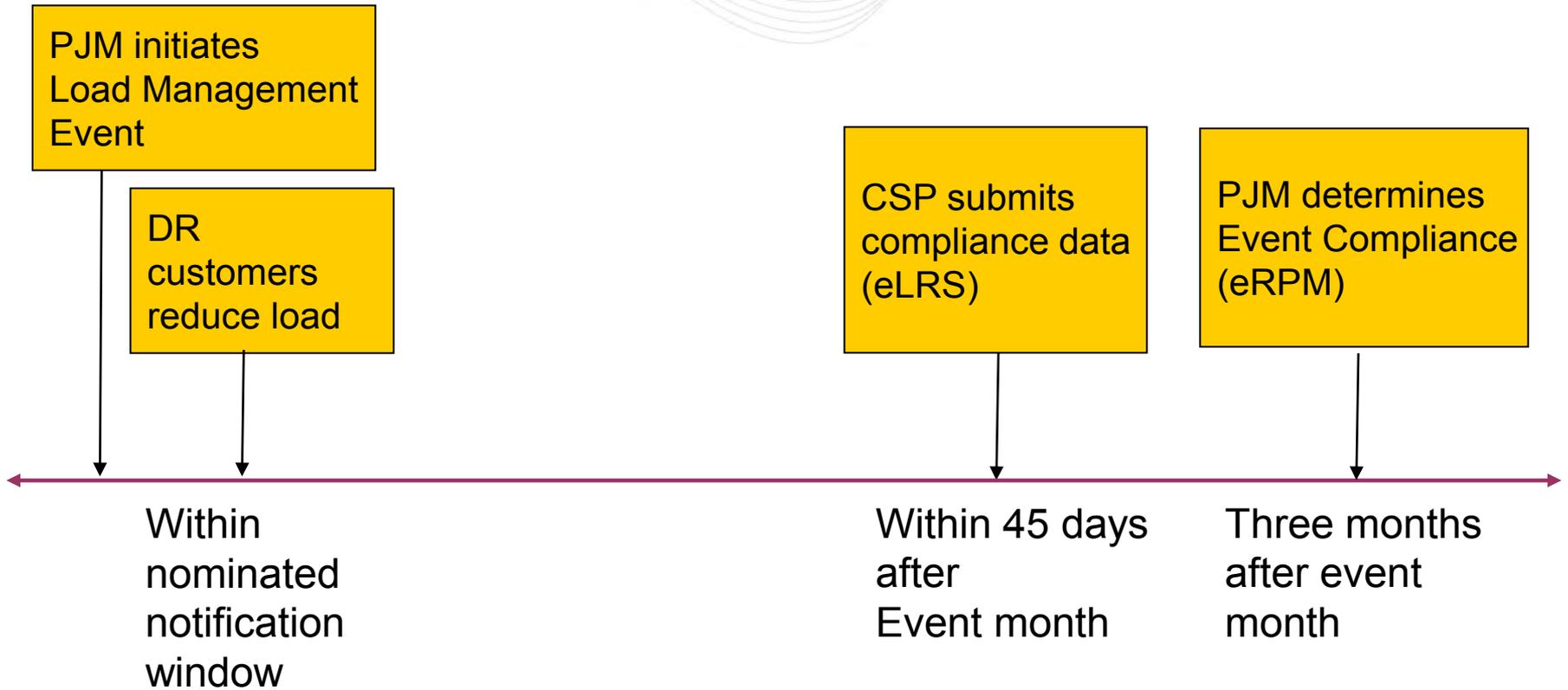
- Different rate for shortfalls in LDA due to RPM commitments versus shortfalls in LDA due to FRR Commitments
- Charges are assessed daily and billed retroactively for the entire Delivery Year in the August bill (issued in September) after the conclusion of the Delivery Year.

- 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.

Delivery Year Statistic	Outage Data Included	Impact of Forced Outage during current DY
EFORd	Forced outage data for 12 months ending September 30 th prior to DY	<p>No impact to final EFORd for the current DY. No impact on commitment compliance for current DY.</p> <p>Impact final EFORd for subsequent DY(s). May impact commitment compliance for subsequent DY(s)</p>
EFORd-5	Forced outage data for 5 years ending September 30 th prior to DY	<p>No impact to final EFORd-5 for DY. No impact to PHPA for current DY.</p> <p>Impact final EFORd-5 for subsequent DY(s). Impact PHPA for subsequent DY.</p>
EFORp	Forced outage data during critical peak hour periods	<p>Impacts the final EFORp for the DY. Impacts PHPA for current DY.</p>

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 - 1. Performance penalties – Load Management Event**

- Resource Providers that have demand resources with RPM Resource Commitments or FRR Capacity Plan Commitments are subject to compliance check performed after each PJM-initiated Load Management event that occurs during the months of June through September for which their demand resource was dispatched.
 - 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 (eLRS) within 45 days after the end of the month in which Load Management event occurred.



- 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)
- Response to transmission sub-zonal dispatch is voluntary (no penalty charges assessed for non-performance) for 2012/2013 and 2013/2014 Delivery Years.
 - Registrations that voluntarily responded must submit compliance information in eLRS.
- Beginning with 2014/2015 Delivery Year, response to transmission sub-zonal dispatch is mandatory (penalty charges assessed for non-performance) if sub-zone is defined and publicly posted the day before the event.
- Response to zonal dispatch is mandatory for the DR product type dispatched within the compliance period of such DR product type.

How is compliance measured for each registration?

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 allocated back to the under-compliant registrations based on under-compliance ratio share.
- Net zonal over-compliance MWs will be allocated back to the over-compliant registrations based on over-compliance ratio share.

Daily LM Event Compliance Penalty Charge =

**Event Under-
Compliance MW
in zone (UCAP)**



**LM Event
Compliance
Penalty Rate in
zone (\$/MW-
day)**

- Load Management Compliance Penalty charges are assessed to those CSP that under-complied during an event.
- Charges for Limited DR event to be assessed daily for each day of the Delivery Year and initially billed 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 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-day) = Lesser of (1/actual number of events during the delivery year, or 50%) * Party's Weighted Daily Revenue Rate (\$/MW-day)

should be on peak period

- Off-Peak LM Compliance Penalty Rate (\$/MW-day) = $1/52 * \text{Party's Weighted Daily Revenue Rate} (\$/\text{MW-day})$
- If a LM Event is comprised of both an On-Peak and Off-Peak Periods, the LM Event Compliance Penalty Charge will be the higher of the charges based on:
 - (A) Under-compliance MWs * On-Peak LM Compliance Penalty Rate
 - (B) Under-compliance MWs * Off-Peak LM Compliance Penalty

- Poll Results
- Auction process to handle multiple products
- Deficiency and penalty change summary

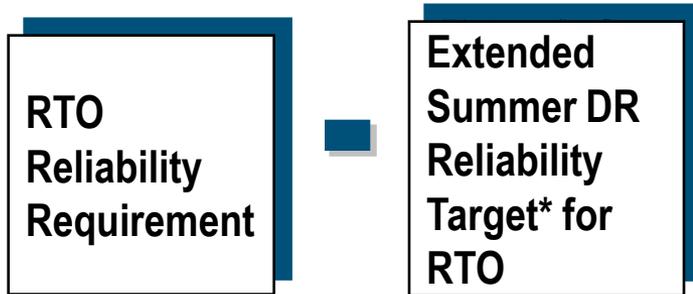
Item	Total Points	Rank
Product Definition/Type	382	1
Market Obligation	292	2
Dispatch	204	3
Capacity value (UCAP)	157	4
Performance Penalty	131	5
Credit Requirements	86	6
Planned Resource (as it relates to the BRA)	85	7
Tracking progress	77	8
Test Requirement	56	9
Market availability	54	10
Measurement	51	11
Must Offer Requirement - Capacity Market	51	11
Resource	44	13
Incremental Auction (IA) Participation	37	14
Portability	24	15
Retirement Requirements	11	16
Fungibility	9	17
Existing Resource (as it relates to the BRA)	2	18
Test Penalty	2	18

•134 total responses

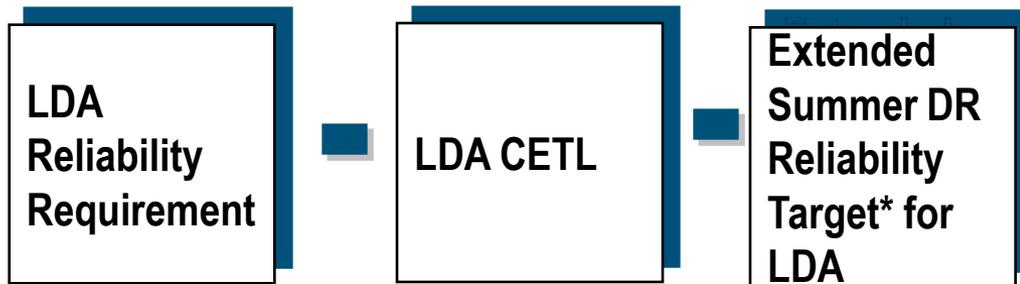
- Limitations of Demand Resources with regards to availability and duration of interruptions are potential Operational Constraints
 - *As the commitment of Limited DR (with 10 interruptions/6 hours per interruption limitations) increases, the commitment of “unlimited resources” decreases, and the need to interrupt Limited DR would increase beyond the tariff limit, and system reliability problems could result.*
- PJM determines Minimum Annual Resource Requirement and Minimum Extended Summer Resource Requirement for RTO and modeled LDAs and includes such requirements in RPM Auctions to recognize and quantify the operational value of capacity resources
- RPM Auction clearing process will select Annual Resources or Extended Summer DR in out-of-merit order if needed to satisfy the minimum requirements

Minimum Annual Resource Requirement = Minimum amount of capacity PJM seeks to procure from Annual resources (generation, Annual DR, and energy efficiency resources) located in RTO/LDA

RTO Minimum Annual Resource Requirement =



LDA Minimum Annual Resource Requirement =



**Extended Summer DR Reliability Target = maximum amount of the combination of Extended Summer DR and Limited DR (in UCAP) determined by PJM in accordance with DR Reliability Target Analysis Procedures.*

Minimum Extended Summer Resource Requirement (Effective 2014/2015 DY)

Minimum Extended Summer Resource Requirement = Minimum amount of capacity PJM seeks to procure from Annual resources (generation, Annual DR, and energy efficiency resources) and Extended Summer DR located in RTO/LDA

RTO Minimum Extended Summer Resource Requirement =

RTO
Reliability
Requirement



Limited DR
Reliability
Target* for
RTO

LDA Minimum Extended Summer Resource Requirement =

LDA
Reliability
Requirement



LDA CETL



Limited DR
Reliability
Target* for
LDA

**Limited DR Reliability Target = maximum amount of Limited DR (in UCAP) determined by PJM in accordance with DR Reliability Analysis Procedures.*

Charge	Rate	MW Amount	Assessed	Billed	Allocated
Capacity Resource Deficiency Charge	Daily Deficiency Rate = Party's WARCP for such resource + higher of (.2 * Party's WARCP for such resource OR \$20/MW-day)	MW Amount of Shortage	Daily	Weekly during DY	Pro-rata basis to those LSEs who were charged Daily Locational Reliability Charge based on their Daily UCAP Obligation
Qualifying Transmission Upgrade Delay Penalty	QTU Delay Penalty Rate = higher of (1) 2 * Locational Price Adder of LDA into which QTU is cleared or (2) Net CONE less the RCP in LDA from which QTU is provided	Cleared MW Amount of Incremental Import Capability Not Delivered	Daily	Weekly during DY	Pro-rata basis to those LSEs who were charged Daily Locational Reliability Charge based on their Daily UCAP Obligation
Peak-Hour Period Availability Charge	Daily Peak-Hour Period Availability Charge Rate = Provider's Weighted Average RCP in LDA	Net Peak Period Capacity Shortfall for RPM Resource Commitments in LDA	Daily	Retroactively for entire DY in August bill (issued in September) after conclusion of DY	Resource providers that have negative Net Peak Period Capacity Shortfalls (capped at excess shortfall * Daily Peak-Hour Availability Charge Rate). Remaining Charges to LSEs based on their Daily UCAP Obligation
	Daily Peak-Hour Period Availability Charge Rate = weighted average of resource clearing prices across all RPM Auctions for the LDA encompassing zone of FRR Entity, weighted by quantities cleared in RPM Auctions.	Net Peak Period Capacity Shortfall for FRR Capacity Plan Commitments in LDA			

$Charge = Rate * MW Amount$

Charge	Rate	MW Amount	Assessed	Billed	Allocated
Generation Resource Rating Test Failure Charge	Daily Deficiency Rate = Party's WARCP for such resource + higher of (.2 * Party's WARCP for such resource OR \$20/MW-day	Daily ICAP Shortfall for RPM Resource Commitments * (1-Effective EFORd)	Daily	Retroactively for entire DY in June bill (issued in July) after conclusion of DY	Pro-rata basis to those LSEs who were charged Daily Locational Reliability Charge based on their Daily UCAP Obligation
	Daily Deficiency Rate = 1.2 * weighted average of resource clearing prices across all RPM Auctions for the LDA encompassing zone of FRR Entity, weighted by quantities cleared in RPM Auctions.	Daily ICAP Shortfall for FRR Capacity Plan Commitments * (1-Effective EFORd)			
PSM Compliance Penalty Charge	Daily Deficiency Rate = Party's WARCP for such resource + higher of (.2 * Party's WARCP for such resource OR \$20/MW-day	Daily PSM Shortfall for RPM Resource Commitments * (1-Effective EFORd)	Daily	Retroactively for applicable peak season days in June bill (issued in July) after conclusion of DY	Pro-rata basis to those LSEs who were charged Daily Locational Reliability Charge based on their Daily UCAP Obligation
	Daily Deficiency Rate = 1.2 * weighted average of resource clearing prices across all RPM Auctions for the LDA encompassing zone of FRR Entity, weighted by quantities cleared in RPM Auctions.	Daily PSM Shortfall for FRR Capacity Plan Commitments * (1-Effective EFORd)			

Charge = Rate * MW Amount

Charge	Rate	MW Amount	Assessed	Billed	Allocated
<p>Load Management Event Compliance Charge</p>	<p>LM Event Compliance Penalty Rate* = Lesser of (1/actual # of events during summer period OR 50%) * Party's Weighted Annual Revenue Rate (\$/MW-yr) in such zone</p> <p>If a Party's Weighted Annual Revenue Rate = \$0/MW-day, a PJM Weighted Annual Revenue Rate in such zone will be used.</p> <p>*Rate prior to 2014/2015 DY.</p>	<p>Net Zonal Under-Compliance MW</p>	<p>LM Event basis</p>	<p>Third billing month after the LM event occurs</p>	<p>DR & ILR Resource Providers that over-complied (capped at MW amount of over-compliance * 1/5 Party's Weighted Annual Revenue Rate). Remaining Charges to LSEs based on Average Daily UCAP Obligation during month of LM event.</p>
<p>Load Management Test Failure Charge</p>	<p>Daily LM Test Failure Charge Rate = Party's Weighted Daily Revenue Rate in zone + Greater of (0.2 * Party's Weighted Daily Revenue Rate in zone OR \$20/MW-day)</p> <p>If a Party's Weighted Annual Revenue Rate = \$0/MW-day, a PJM Weighted Daily Revenue Rate in such zone will be used.</p>	<p>Net Zonal Under-Compliance MW</p>	<p>Daily</p>	<p>Monthly; however, lump sum assessed from start of DY to day charges are first reflected in billing.</p>	<p>Allocated pro-rata to those LSEs charged a Daily Locational Reliability Charge based on their Daily UCAP Obligation.</p>

Charge = Rate * MW Amount

1. Capacity Market Participation
 1. Product Definition/Type
 2. Capacity Value (UCAP)
2. Market Obligation for cleared capacity resource
 1. Market Obligation
 2. Dispatch
- 3. Compliance/Penalties**
 - 1. Performance penalties – Generation Capability**

- 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).

1. Capacity Market Participation
 1. Product Definition/Type
 2. Capacity Value (UCAP)
2. Market Obligation for cleared capacity resource
 1. Market Obligation
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- 3. Compliance/Penalties**
 - 1. Performance penalties – Peak Season Maintenance**

- 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.