



Reliability Pricing Model Fixed Resource Requirement

RPM Training – Appendix A
February 2012

- Fixed Resource Requirement Alternative
 - Purpose of FRR Alternative
 - Participation Requirements
 - Capacity Obligation
 - FRR Capacity Plan
 - Locational Constraints
 - Delivery Year Activity

- Option to meet a **fixed** capacity resource requirement in contrast to RPM that includes a **variable** resource requirement.
- How it differs from RPM:
 - FRR LSE does not pay RPM Locational Reliability Charge
 - Capacity resources included in an LSE's FRR Capacity Plan do not receive RPM Resource Clearing Prices

To elect the FRR Alternative for an FRR Service Area for a DY, an LSE must notify FRR election two months before Base Residual Auction (BRA) for the DY. The election shall:

- be for a minimum term of 5 consecutive Delivery Years.
- demonstrate meeting the eligibility requirements.
- indicate intention to offer in any RPM auctions or to sell capacity to a direct or indirect purchaser who may use it in any RPM Auctions or as RPM replacement capacity.

FRR eligibility requirements defined in Schedule 8.1 of the Reliability Assurance Agreement (RAA).

- Within 10 business days PJM will either validate that the LSE meets the FRR eligibility requirements or notify that the FRR election is invalid.
 - If the FRR election is invalid, the LSE will be required to serve its load under the RPM for the Delivery Year.
 - If the FRR Alternative is valid, the LSE must submit its initial FRR Capacity Plan through the eRPM system at least one month prior to BRA.

- LSE may terminate its FRR election effective the Delivery Year following the minimum term of five consecutive Delivery Years.
- After termination the LSE will not be eligible to re-elect the FRR Alternative for five years.
- In the event of a State Regulatory Structural Change as defined in the RAA, an LSE may elect or terminate its election of the FRR Alternative effective any Delivery Year.

- Preliminary RTO and Zonal Peak Load Forecasts
- LDAs modeled in the Base Residual Auction
- Installed Reserve Margin (IRM)
- Pool-wide Average EFORd
- Forecast Pool Requirement (FPR)
- Demand Resource (DR) Factor
- Transmission upgrades projected to be in service for the Delivery Year
- Cost of New Entry (CONE) for the PJM Region and each modeled LDA
- Net Energy and Ancillary Services Revenue Offset of the PJM Region and each modeled LDA
- Base Zonal FRR Scaling Factor
- Percentage of Internal Resources Required in an LDA
- Minimum Annual Resource Requirement & Minimum Extended Summer Resource Requirement (2014/2015 DY)
- Deadline for FRR Capacity Plan Submittal

http://www.pjm.com/markets-and-operations/rpm/rpm-auction-user-info.aspx

The screenshot shows the 'RPM Auction User Information' page. It includes a navigation menu on the left, a main content area with a title and introductory text, and a table of documents. A red circle highlights the 'Planning Period Parameters (XLS)' entry in the table.

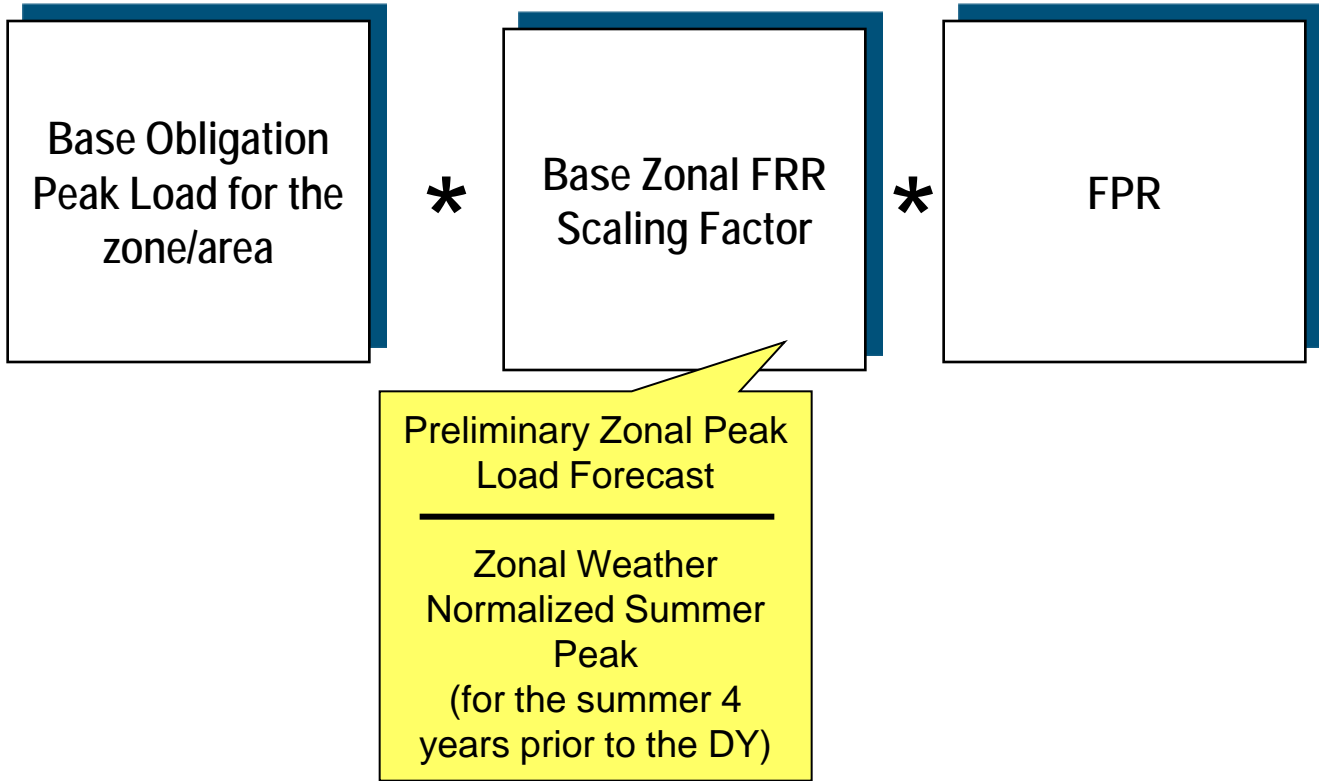
Document Name	Posting Date
RPM Brattle Report (PDF)	06.30.2008
RPM Schedule (XLS)	03.19.2008
Non-Unit Specific Capacity Transaction Pricing Points (PDF)	02.18.2009
Key Expected Transmission Upgrades (XLS)	02.15.2007
2007/2008 Peak Hour Performed Availability Calculator (XLS)	09.10.2008
Reliability Pricing Model Frequently Asked Questions	
CIRs Notification	
Delivery Year	
2007/2008	
RTO VBR Curve Calculation (XLS)	03.14.2008
2007 RECS Allocation (PDF)	12.07.2006
2007/2008 BRA LBA Specific Supply Curves (PDF)	06.29.2007
2007/2008 Base Residual Auction Results (XLS)	05.31.2007
2007/2008 EFORs Operating Reserve Threshold Values (XLS)	01.13.2008
2007/2008 Non-Unit Specific Transaction Pricing Points (XLS)	05.31.2007
2007/2008 BRA Mitigated Supply Breakdown (PDF)	02.07.2008
2007/2008 RPM Zonal Scaling Factors (PDF)	09.10.2008
RRR Resource Allocation (PDF)	03.19.2007
RPM Resource Model (XLS)	11.12.2007
Preliminary Market Structure Screen (PDF)	02.02.2007
Planning Period Parameters (XLS)	02.23.2007
2007/2008 Calculated Peak Load for 2007-2010 (PDF)	01.08.2007

Planning Period Parameters posted by Delivery Year on RPM Auction User Information web page.

- FRR Service Area is a defined “area” within or external to a zone.
- Only one LSE shall serve the entire load in an FRR Service Area.
- The EDC estimates the Base Obligation Peak Load for the FRR Service Area in their zone.

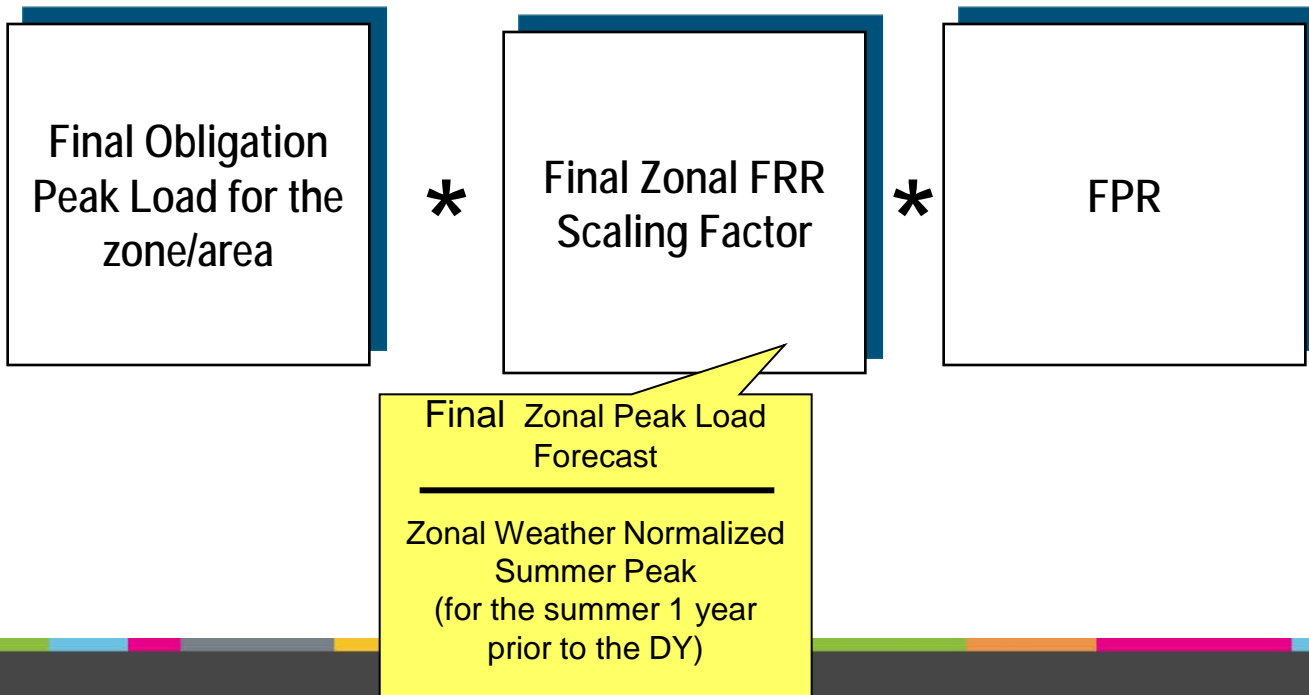
The load obligation is constant throughout the Delivery Year.

- Preliminary Daily Unforced Capacity Obligation**



The load obligation is constant throughout the Delivery Year.

- **Final Daily Unforced Capacity Obligation**
 - The EDC estimates the Final Obligation Peak Load for the FRR Service Area in their zone by December 31 prior to the start of the Delivery Year.



Resources available to include in an FRR Plan:

**Generation
Resources**

(Existing or Planned)

**Demand
Resources ((DR)**

**Energy
Efficiency (EE)**

(Existing or Planned)

**Bilateral
Contracts for
Unit-Specific
Capacity
Resources**

- Any capacity resource that cleared in any RPM Auction is not eligible
- Any capacity resource that was not offered or offered but did not clear in any RPM Auction may be included.
- Resources may be committed for less than a full Delivery Year; however, the FRR Capacity Plan in aggregate must satisfy all obligations for the Delivery Year.
- If an LSE has committed capacity to meet a Threshold Quantity, the excess resources may be used to meet any increase in the Daily Unforced Capacity Obligation from Preliminary to Final.
- Qualifying Transmission Upgrades may be used to reduce the Percentage of Internal Resources Required in an LDA.
- FRR Entity may elect the lower of the $EFORd_{1yr}$ or $EFORd_{5yr}$ calculated using outage data ending September 30 prior to the BRA for the purposes of evaluating the initial FRR Capacity Plan
 - If $EFORd_{1yr}$ is 25% or higher, the FRR Entity may elect to use a $EFORd_{5yr}$ recalculated excluding outage data for the most recent one year period.
- $EFORd$ applied to the Final FRR Capacity Plan during the Delivery Year will be the $EFORd$ determined by PJM using the forced outage data from the 12 months ending September 30th prior to the Delivery Year.

- Commitment of capacity to satisfy the daily zonal unforced capacity obligations including any applicable Percentage of Internal Resources Required in the LDA.
 - Must also commit capacity to satisfy Minimum Annual Resource Requirement & Minimum Extended Summer Resource Requirement associated with FRR Entity's UCAP obligation (effective with 2014/2015 DY)
- If the LSE intends to sell capacity resources to a direct or indirect purchaser for use in RPM, the LSE must also maintain a Threshold Quantity in its Capacity Plan.

Threshold Quantity =

Preliminary Daily Unforced Capacity Obligation	+	Lesser of: (.03 * Preliminary Daily Unforced Capacity Obligation) OR 450 MW
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If the initial Capacity Plan is not adequate, the election of the FRR Alternative will not be approved. The LSE will be required to participate in RPM for the Delivery Year for which the Capacity Plan was proposed.

FRR Resource Commitment Information

Company: **TEST** Resource Name: **ALL** Refresh Upload/URL

Start Day: Stop Day: [Details](#) [Create New FRR Commitment](#)

Pages: 1 Records: 1 - 1 of 1 matches

FRR Plan Details

Start Day	Stop Day	Obligation MW	Threshold MW	Sales Cap MW	Self Schedule Cap MW
05/01/2007	05/01/2008	1500.0	450.0	1300.0	200.0

Pages: 1 Records: 1 - 2 of 2 matches

FRR Resource Commitments

Resource ID	Resource Name	Resource Type	Start Day	Stop Day	EFORd	Designated ICAP MW	Calculated UCAP MW
09999902	TEST BR 1	DEMAND	10/05/2007	05/01/2008	0.00000	9.0	9.3
09999901	TEST GEN 1	GEN	10/01/2007	12/01/2007	0.02154	20.0	19.8
Total:						29.0	29.9

FRR Resource Commitments can be created and modified.

FRR Resource Commitment Information

Start Day: Stop Day:

Company: **TEST** Resource: **TEST DR 1**

Designated MW/CAP:

Pages: 1 Records: 1 - 1 of 1 matches

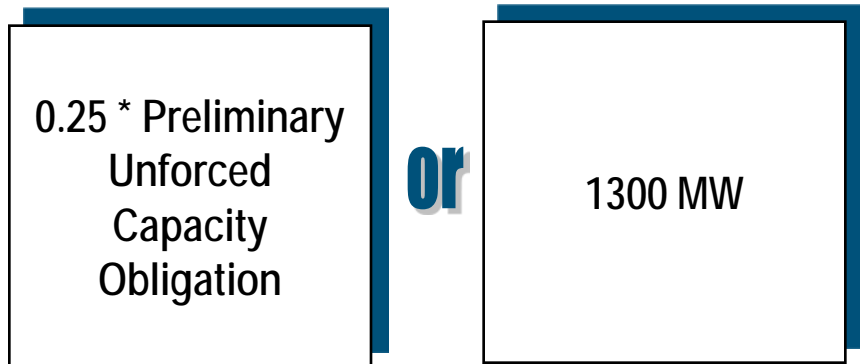
Available MW

Effective Day	Termination Day	Available MW
2007-10-05	2008-05-01	9.0

[Update](#) [Cancel](#)

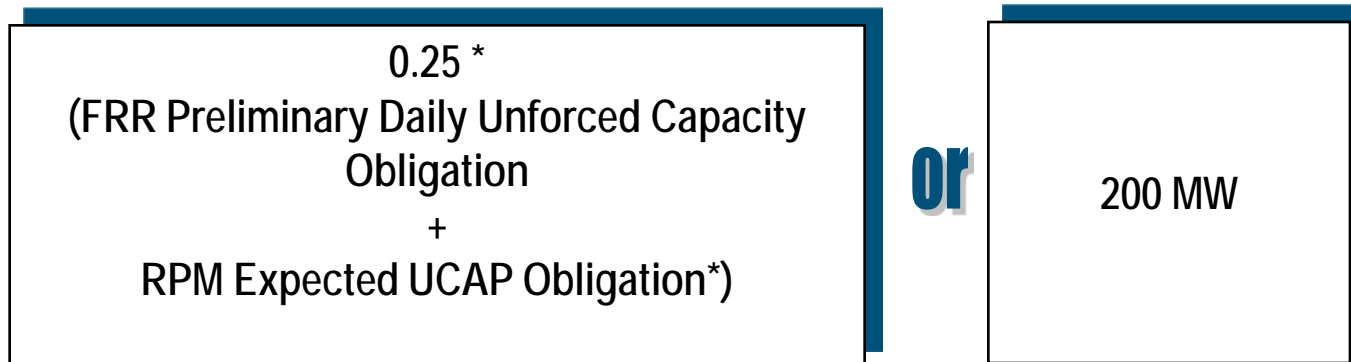
- If Threshold Quantity is not satisfied, FRR LSE cannot sell capacity in excess of the amount needed for its Capacity Plan to satisfy RPM obligations; however, they can sell such excess to outside PJM or to an FRR Entity.
- If Threshold Quantity is satisfied, FRR LSE may sell capacity in excess of its Threshold Quantity to satisfy RPM resources up to a Sales Cap Amount.

Sales Cap Amount = lesser of:



- FRR LSEs also serving load under RPM may self-supply capacity resources in RPM Auction and avoid the requirement to satisfy a Threshold Quantity; however, there is a Self-Supply Offer Cap Amount.

Self-Supply Offer Cap Amount = lesser of:



*An LSE's RPM Expected UCAP Obligation in a Zone is equal to the LSE's allocation of the Zonal Weather Normalized Summer Peak for summer four years prior to the Delivery Year (i.e., an Obligation Peak Load) * (Preliminary Zonal Peak Load Forecast/Zonal Weather Normalized Summer Peak for summer four years prior to Delivery Year) * Forecast Pool Requirement.

- A minimum Percentage of Internal Resources Required in the FRR Capacity Plan is defined for a constrained LDA.
 - Internal capacity resources must be located in the LDA in which the FRR Service Area is located.
- An approved Qualified Transmission Upgrade may be used to reduce the Amount of Internal Capacity Required.
- Capacity Transfer Rights are implicitly allocated to the FRR LSE in the determination of the Percentage of Internal Resources Required in an LDA. An FRR LSE will not be eligible for any explicit CTRs.

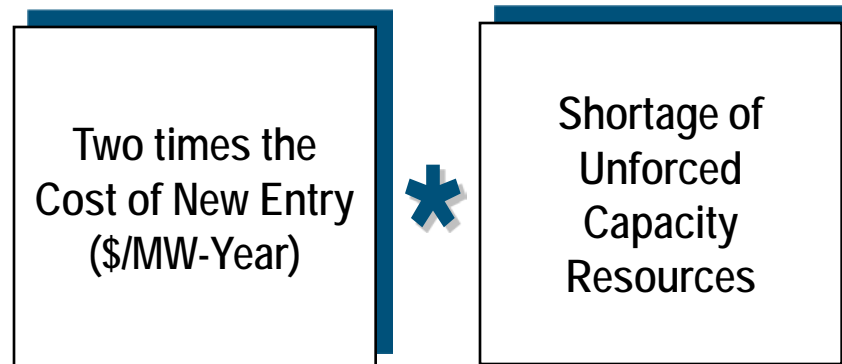
Internal Resource Requirement in an LDA =



Internal resource requirement is expressed as a percentage of the Unforced Capacity Obligation based on Preliminary LDA/Zonal Peak Load Forecast multiplied by FPR.

- FRR LSE must annually commit sufficient capacity for each succeeding Delivery Year.
- If the capacity is not adequate for a Delivery Year:
 - the LSE will be assessed an FRR Commitment Insufficiency Charge for the shortage in meeting the Percentage of Internal Resources Required in LDA or the Preliminary Daily Unforced Capacity Obligations (including any Threshold Quantity) for the remainder of the minimum term of the FRR election.
 - The LSE will be required to switch to RPM for the Delivery Year for which the capacity is insufficient and the subsequent Delivery Years.

FRR Commitment Insufficiency Charge =



- The shortage identified in the first delivery year that this charge is to be assessed is to be applied in the any remaining delivery years that the charge is to be assessed.
- FRR Commitment Insufficiency Charge is allocated to LSEs that were charged RPM Locational Reliability Charge.

- FRR LSE will pay a Capacity Resource Deficiency Charge for any shortage of resources to meet the Amount of Internal Resources Required in an LDA and the Final Daily Unforced Capacity Obligation.
- Shortage to meet the Internal Resources Required is calculated by comparing an LSE's daily LDA FRR Resource Position to its Internal Resources Required. Any shortage will be assessed a FRR Capacity Resource Deficiency Charge.
- Similarly the total shortage to meet the Final Daily Unforced Capacity Obligation is calculated. A deficiency charge for this shortage less the shortage calculated for failure to satisfy the Internal Resources Required in the LDA will be assessed.

FRR Capacity Resource Deficiency Charge =

Effective with 2014/2015 DY, shortages in meeting Minimum Annual Resource Requirement and Extended Summer Resource Requirement will also be calculated.

1.2 * Weighted Average Resource Clearing Prices from all RPM auctions for the LDA encompassing the FRR Service Area, weighted based on quantities cleared in auction (in \$/MW-Day)



Shortage Amount (MW)

- If the Qualifying Transmission Upgrade into the LDA included in the FRR Capacity Plan was not completed by the start of the Delivery Year and the upgrade was not replaced with an equivalent amount of Capacity Resources in the LDA, then the Amount of Internal Resources Required will be increased.
- LSE may be subject to a FRR Capacity Resource Deficiency Charge for the increase in the Amount of Internal Resources Required.

Penalty/Charge	Rate
Generation Resource Rating Test Failure Charge	1.2 * Weighted Average Resource Clearing Price from all auctions for the LDA encompassing the FRR Service Area (in \$/MW-Day)
Peak Season Maintenance Compliance Penalty Charge	1.2 * Weighted Average Resource Clearing Price from all auctions for the LDA encompassing the FRR Service Area (in \$/MW-Day)
Peak-Hour Period Availability Charge	Weighted Average Resource Clearing Price from all auctions for the LDA encompassing the FRR Service Area (in \$/MW Day)
Load Management Event Compliance Charge <i>(expect changes to charge with 2014/2015 DY)</i>	<p>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 Party's Weighted Annual Revenue Rate = \$0/MW-day, a PJM Weighted Annual Revenue Rate in an LDA will be used.</p>
Load Management Test Compliance Charge	<p>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 Party's Weighted Annual Revenue Rate = \$0/MW-day, a PJM Weighted Annual Revenue Rate in an LDA will be used.</p>

- The Daily FRR Capacity Resource Deficiency Charges, FRR Transmission Upgrade Delay Penalties, Generation Resource Rating Test Failure Charges, Peak Season Maintenance Compliance Penalty Charges, and Load Management Test Failure Charges are distributed on a pro-rata to the LSEs in the RTO that were charged an RPM Locational Reliability Charge, based on LSE daily unforced capacity obligations.
- FRR Load Management Event Compliance penalties are allocated similar to DR and ILR under RPM, first to the LSEs with excess compliance (subject to a cap) and any balance to all LSEs in the RTO.
- Peak-Hour Availability Charges in LDA are allocated similar to resources under RPM, first to Resource Providers with Net Peak Period Capacity excess in LDA. Any balance is allocated to the LSEs in the LDA that were charged an RPM Locational Reliability Charge and FRR LSEs in LDA with resource portfolio that over performed (i.e. with negative Net Peak Period Capacity Shortfall.)