Capacity Obligations for Forecasted Large Load Adjustments

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Markets and Reliability Committee

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Background

- PJM's existing load forecast process allows an EDC or LSE to propose a large load adjustment ("LLA") to improve forecast accuracy
  - Adjust zonal forecast for major zone/area changes that are not captured in the embedded forecast (data centers, etc.)
  - Process includes stakeholder review at LAS and is included in M19, attachment B
  - Approved adjustments are published in the annual forecast report in Table B9
- There have been significant positive adjustments from rapid increase in data centers in specific zones.

Issue

- Large load adjustment to zonal forecast is assumed to occur on same relative basis to all zone/areas within the zone.
  - For example, if LLA adjustment results in a 1% increase in the zonal load forecast, it is assumed that all zone/areas within the zone should be increased by 1%.
  - Zone/areas typically represent investor owned utility or muni/coop load within the zone
  - LLA may be significantly different for each zone/area.
  - Existing allocation process can create a misalignment in the capacity obligations and associated cost impacts (especially in zones that represent both FRR and RPM load)
- The mechanisms within the RAA that cause this issue are the Base and Final Zonal Scaling Factors that apply similarly for RPM or FRR participants.
- Problem Statement and Issue Charge were initiated at the MIC on 9/6/23

The LLA improves forecast accuracy but may misalign capacity allocation on a temporary basis within the zone

Stakeholder Interests

- Ensures an unbiased, transparent, traceable process to receive inputs and easily administered calculation of LSE UCAP Obligation.
- Ensure solutions are applicable across all zones for any large load adjustment.
- Send appropriate signals to market participants; prior to the BRA, ensure accurate assignment of Large Load Adjustments between RPM (VRR Curve) and FRR Obligations within a single zone.
- Accurately assign large load adjustments capacity obligations to the appropriate entity.

Summary of Solution Package

- Define Large Load Adjustment (LLA) as any MW quantity reported in Table B-9 in the annual PJM Load Forecast Report.
- Largely retain status quo in determining Base Zonal Scaling Factors for FRR and RPM LSEs, but excludes the LLA in the Base Zonal Scaling Factor determination if there is an LLA projected within the zone at time of the BRA that can be allocated to a zone/area.
- Largely retain status quo in determining Final Zonal Scaling Factors for FRR and RPM LSEs, but excludes the LLA in the Final Zonal Scaling Factor determination if there is an LLA projected within the zone at the time of Delivery Year that can be allocated to a zone/area.
- Method developed to include a new step to add the LLA MW to the Capacity Obligation of the appropriate zone/area.
- PJM will post identified LLAs and adjusted RPM and FRR scaling factors.

MIC endorsed with 4 objections and 7 abstentions

Process (normal auction schedule)

Adjust zonal weather normalize load in DY-4 for DY forecast

Adjust zonal weather normalize load in DY-1 for DY forecast

Allocate capacity obligation to LSE on daily basis

Base Scaling Factor

Final Scaling Factor

Delivery Year

RPM capacity procurement in auction and preliminary FRR capacity obligation

RPM capacity procurement in 3rd IA and final FRR capacity commitment

OPL assignment to zone/area process for the Delivery Year

- In the December prior to each delivery year, each EDC calculates the Obligation Peak Load ("OPL") for each zone/area in its zone where the OPL is determined by the EDC as the zone/area's MW share of the Zonal W/N Peak Load
  - The sum of all zone/area OPLs must equal the Zonal W/N Peak Load
  - OPLs determined in December take effect in the upcoming delivery year
  - The OPL of a zone/area is held constant each day of the delivery year
  - The OPL of a zone/area may be further allocated on a daily basis to multiple LSEs serving load in the zone/area subject to the requirement that the daily summation of the LSE OPLs equals the zone/area OPL
- The proposed change will adjust the EDC provided OPL of a zone/area for the LLA MW
  - The adjusted zone/area OPL MW is to be used by PJM to determine the capacity obligation of each zone/area

Zone/Area Capacity Obligations Example – Status Quo

Zonal W/N Peak Load	**21,000**	(A)
Zonal Forecast Peak Load	**23,500**	(B)
Forecast Pool Requirement ("FPR")	1.1	(C)
Zonal Capacity Obligation	**25,850**	(B x C)
Zonal Peak Load Scaling Factor ("ZPLSF")	1.119	(B / A)

	W/N Peak Load MW	Forecast Peak Load MW	Capacity Obligation MW
Zone/Area	**OPL MW**	**OPL*ZPLSF**	**Forecast Peak Load MW*FPR**
Zone A / Area A	16,000	17,905	19,695
Zone A / Area X	2,000	2,238	2,462
Zone A / Area Y	2,000	2,238	2,462
Zone A / Area Z	1,000	1,119	1,231
	21,000	**23,500**	**25,850**

Note: The capacity obligation MW of each zone/area is equal to (OPL MW * ZPLSF * FPR).

(1) If the zone/area is FRR, then the FRR Entity's Capacity Plan must satisfy this capacity obligation MW quantity.

(2) If the zone/area is RPM, the UCAP Obligation MW of the zone/area is determined by multiplying this capacity obligation MW quantity times the Obligation Peak Load Scaling Factor ("OPLSF") where the OPLSF is equal to the total RTO UCAP MW procured aross all auctions conducted for the delivery year divided by the RTO Reliability Requirment of the delivery year. **The UCAP Obligation MW of an RPM zone/area is therefore equal to (OPL MW * ZPLSF * FPR * OPLSF)**.

Zone/Area Capacity Obligations Example – MIC Proposal

Zonal W/N Summer Peak of prior summer (**"ZWNSP"**)	**21,000**	
Zonal Peak Load Forecast for DY (**"ZPLDY"**)	23,500	
Forecast Pool Requirement (**"FPR"**)	1.1	
Zonal Unforced Capacity Obligation	**25,850**	Value assumes RPM capacity is procured at exactly the target level of forecast peak times FP
Total Zonal MW Quantity of LLAMW for DY (**"ZLLA"**)	2,000	(see LLA table directly below for calculation)
Obligation Peak Load associated with ZLLA	1,953	(see LLA table directly below for calculation)
Adjusted Zonal W/N Summer Peak (**"Adjusted ZWNSP"**)	**22,953**	(=ZWNSP + Obligation Peak Load associated with ZLLA)
Zonal RPM Scaling Factor	1.0238	(=Zonal UCAP Obligation/(Adjusted ZWNSP * FPR))

Zone/Area	LLAMW	LLAOPL
Zone A / Area Y	1,000	977
Zone A / Area Z	1,000	977
	2,000	**1,953**

LLAMW is the total MW quantity of LLA of a zone or zone/area

LLAOPL is the Obligation Peak Load associated with the LLAMW of a zone or zone/area where LLAOPL = LLAMW * (ZWNSP / (ZPLDY - ZLLA))

Zone/Area	ZWNSP	LLAOPL	OPL MW (ZWNSP + LLAOPL)	Unforced Capacity Obligation (OPL MW * Zonal RPM Scaling Factor * FPR)
Zone A / Area A	16,000	0	16,000	18,019
Zone A / Area X	2,000	0	2,000	2,252
Zone A / Area Y	2,000	977	2,977	3,352
Zone A / Area Z	1,000	977	1,977	2,226
	21,000		**22,953**	**25,850**

Note: If the zone/area is FRR, then the unforced capacity obligation of the zone/area is set equal to FPR times the Zonal FRR Scaling Factor times the summation of the zone/area's MW share of the ZWNSP plus the Obligation Peak Load MW associated with any LLAMW specified for the Delivery Year for the zone/area. The Zonal FRR Scaling Factor for each Zone is set equal to the [(ZPLDY – ZLLA) / ZWNSP].

How does the proposed solution align with identified interest?

Stakeholder interests	Proposed solution
Ensures an unbiased, transparent, traceable process to receive inputs and easily administered calculation of LSE UCAP Obligation.	Clearly defines LLA as any MW quantity reported in the load forecast Table B-9; PJM will post identified LLAs and adjusted RPM and FRR scaling factors with planning parameters.
Ensure solutions are applicable across all zones for any large load adjustment.	Applies to all zones to appropriate allocation and account for LLA between Zone/Areas.
Send appropriate signals to market participants; prior to the BRA, ensure accurate assignment of Large Load Adjustments between RPM (VRR Curve) and FRR Obligations within a single zone.	Allocates the LLA to the appropriate zone/area prior to the Base Residual Auction and submission of FRR plan for the applicable delivery year.
Accurately assign large load adjustments capacity obligations to the appropriate entity.	PJM will allocate LLAs to the appropriate zone/areas after applying adjusted Zonal Scaling Factors, which consequently facilitates the addition of the LLA to the UCAP obligation of the appropriate LSE based upon the EDC's protocol.

Summary

- Assign approved large load adjustments directly to zone/area instead of incorporating into overall load forecast and associated zonal Scaling Factors
- No change to existing forecast process
  - but plan to make a M19 clarification based on MIC approved package (LSE recommended adjustments) if Governing Document changes are adopted.
- Proposed changes applicable for 25/26 Final Scaling Factors and 26/27 Base/Preliminary and Final Scaling Factors

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