



Market Redefinition: Accreditation Reform

RASC

August 22-23, 2023

(Issues RASC-2020-4 and 2019-2)

Updated feedback request on 8/21/23 to
include Schedule 53 Redlines

Purpose & Key Takeaways



Purpose:

1. Discuss some of the drivers for the DLOL results
2. Continue discussion related to the PRMR allocation
3. Share MISO's strawman proposal for allocation of the PRMR

Key Takeaways:

- MISO has published D-LOL results based on the current planning year assumptions and provided explanations for some of the drivers
 - Additional work is underway to produce future year results in a consistent manner and MISO will share future results when available
- MISO is proposing to move away from a PRMR based on peak load and would set requirements based on periods with the greatest reliability risk observed in the LOLE model
- MISO's strawman proposal is to use the LOLE model and historical loads to determine an LSE's allocation of the PRMR
- MISO is targeting a FERC filing in November 2023

Direct-LOL Results

MISO is committed to developing forward looking Direct-LOL results and trends and share with stakeholders in the coming months

- MISO is evaluating options to calculate D-LOL results for the expanded fleet (e.g., current fleet + higher solar penetration) and share indicative results later this year
- MISO plans to use the Regional Resource Assessment (RRA) to publish forward looking accreditation and planning reserve margin requirement estimates starting with the 2024 RRA



Seasonal Direct-LOL results by resource class will vary depending on input assumptions to the Loss of Load Expectation (LOLE) model and modeled resource mix

Resource Class	Summer - 2,695 hrs		Fall - 269 hrs		Winter - 215 hrs		Spring - 206 hrs	
	UCAP	DLOL	UCAP	DLOL	UCAP	DLOL	UCAP	DLOL
Gas	91%	89%	89%	89%	84%	70%	88%	74%
Coal	92%	91%	91%	88%	90%	72%	89%	75%
Hydro	97%	97%	97%	99%	42%	68%	62%	70%
Nuclear	95%	91%	96%	86%	95%	87%	92%	80%
Pumped Storage	99%	98%	91%	97%	94%	57%	89%	75%
Solar	45%	37%	25%	27%	6%	1%	15%	17%
Wind	18%	12%	23%	15%	40%	14%	23%	18%
Storage	95%	94%	95%	94%	95%	94%	95%	95%
Run-of-River	100%	100%	100%	100%	100%	100%	100%	100%

Resource class results expected to change as LOLE modeling enhancements are made to better reflect reliability risks across the year and the changing fleet, e.g., storage results expected to decrease

As a follow up to the July RASC, MISO is planning a September workshop to discuss LOLE modeling and PRMR in more detail

July RASC Action Item	MISO Response
Explain planned outage optimization within the LOLE model.	MISO is planning a September workshop to discuss the LOLE modeling in more detail.
Explain the lower DL0L results for the thermal classes in spring and winter.	The thermal DL0L results for spring and winter are driven by several factors, including: planned maintenance, cold-weather outages, and LOLE targets.
Explain the low DL0L result for solar in summer.	The 45% UCAP value is an average-ELCC value while the 37% DL0L value is derived from availability during LOL hours, which are later in the evening.
Explain the low DL0L result for wind in winter.	While some LOL hours occur during evening hours when wind generation is typically highest, 85% of the total winter LOL hours occur in the 2021 weather year, which was a weather year with low wind generation even in the evening hours. As a reminder, DL0L is the average availability during LOL hours across all weather years.

MISO's accreditation design is near final with the expansion of hours being the one remaining feature still being considered

Design Element	MISO Proposal	Features still being considered
Hour Selection	Loss of Load (LOL) hours only	Expansion of hours to include hours within a certain margin threshold (e.g., 3% margin)
Direct-LOL calculation	Straight average of all LOL hours	Design final
Resource Classes	Gas, Coal, Hydro, Nuclear, Pumped Storage, Solar, Wind, Storage, Run-of-River	Design final

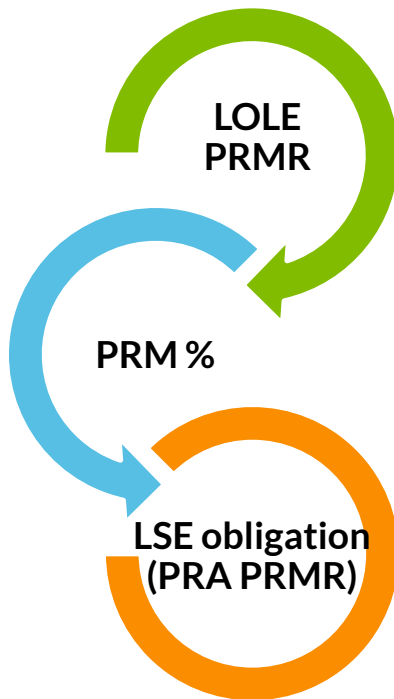
MISO suggests extending Schedule 53 to all resources (except LMRs) although some design elements may need to be modified (Unit Level Design)

Design Elements		Today under current Schedule 53	Proposed changes to Schedule 53
Hour Selection	Calculation of operating margin to identify RA hours	Online margin + offline margin with 12 hours or less lead time divided by RT load	No Change
	Top X% of tightest margin hours	Tier-1: all hours excluding tight hours in Tier-2 Tier-2: MaxGen hours supplemented with top 3% of tight margin hours per season	No Change
	Margin threshold	25%	No Change
	Seasons with no/ limited RA hours to meet 3% per season (65 hours)	Supplement deficient number of hours with Annual Average Offered Capacity (AAOC) over top 3% of tightest margin hours per year	Fill deficient hours with seasonal class DLOL % (Current UCAP during transition)
	Regionality (N+C/S) (tight margin and MaxGen hours)	Yes	No Change
	Leadtime for offline units (tight margin calc)	24 hours	No Change
Accreditation Calculation	Annual verses seasonal	4 season	No Change
	Tiered weighting	Tier-1 20%; Tier-2 80%	No Change
	Leadtime for offline units	24 hours	No Change
	Real-time offer considered	Tier-1 & Tier-2 Emergency Max	Real-time availability for Wind/Solar; All other resources will use Emergency Max (same as today)
	Adjustment Ratio	Multiply ISAC by ratio of thermal class UCAP to ISAC	Resource ISAC * (Class DLOL/Class ISAC) (Current UCAP during transition)
Planned Outage Exemption	Exemption removes hours from the Schedule 53 calculations	Yes, full out-of-service outages only with proposed three-level structure (none, Tier-1, Tier-2)	No Change

PRMR and Load Serving Entity (LSE) obligations

MISO's current process translates the requirement established in the LOLE study to the obligation in the Planning Resource Auction (PRA)

PRM % is calculated by subtracting the modeled MISO-system coincident peak demand from the PRMR and then dividing by the modeled MISO-system coincident peak demand.



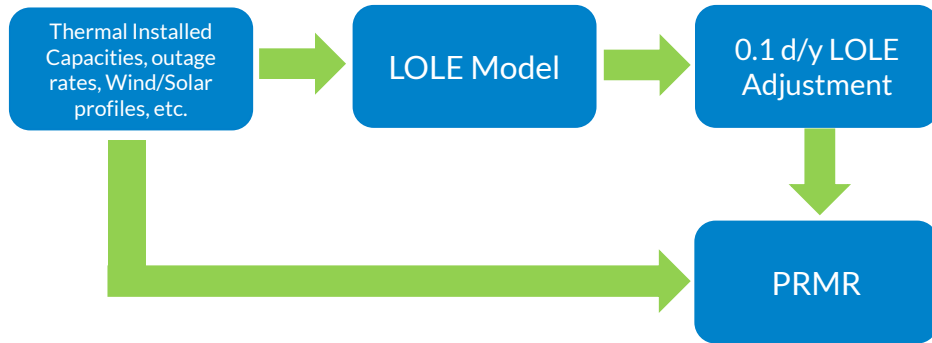
MISO determines the PRMR through completion of the seasonal Loss of Load Expectation (LOLE) study. The PRMR is equal to the total capacity needed to meet a LOLE of 1 day in ten years.

LSE Coincident Peak Forecast multiplied by Transmission Loss % and the PRM %.

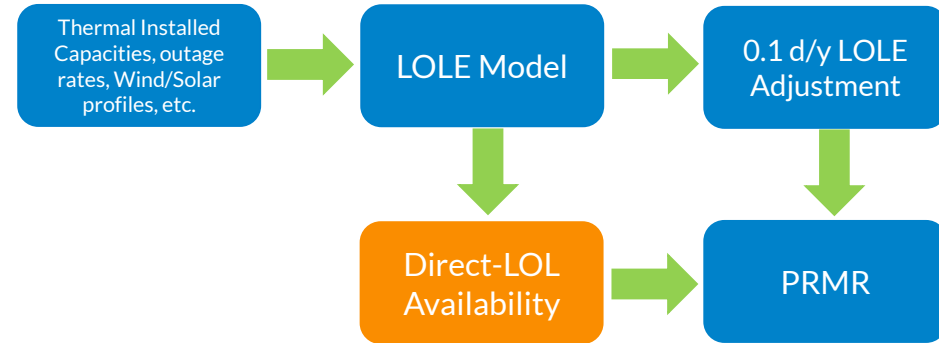
The current process utilizes Unforced Capacity (UCAP) as an input into the LOLE model and the PRMR calculation, while the proposed Direct-LOL methodology utilizes an output from the LOLE model for the PRMR calculation



Current Process



Proposed Process



Seasonal DLOL PRMR results* are dependent on modeling assumptions

Resource Class Accredited Capacity (MW)	PY 23/24 Summer	PY 23/24 Fall	PY 23/24 Winter	PY 23/24 Spring	Formula Key
Thermal	112,625	110,506	92,398	94,522	[A]
Run-of-River	966	966	966	966	[B]
Wind	3,076	3,816	3,992	4,966	[C]
Solar	1,734	1,689	99	2,041	[D]
Storage	28	28	54	55	[E]
BTMG	4,196	4,218	4,163	4,240	[F]
Demand Response	7,397	7,041	5,388	6,280	[G]
Firm External Support	1,707	1,714	1,857	1,778	[H]
Adj. {1d in 10yr}	(4,000)	(10,000)	(6,200)	(12,750)	[I]
PRMR	127,729	119,978	102,717	102,098	[J]= sum of [A] through [I]

PRMR expected to change as LOLE modeling enhancements are made to better reflect risk

*New version of SERVIM utilized to produce results

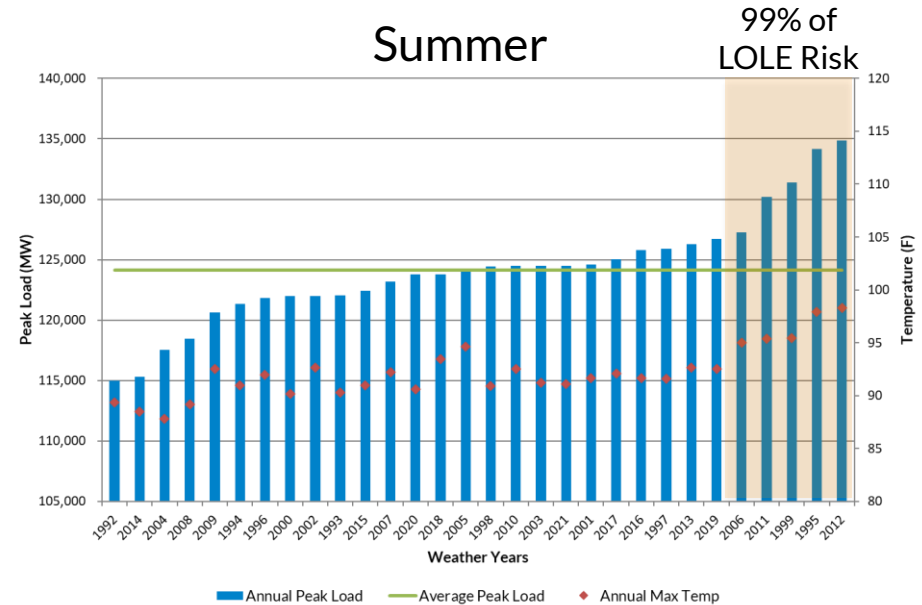
BTMG, Demand Response and Firm External Support MW are represented as current UCAP



Accreditation reform drives the need for LSE obligations to be better aligned with Demands during periods of the highest reliability risk

Problem Statement

The current Load Serving Entity (LSE) obligation to regional resource adequacy is based on the LSE load's coincidence with MISO's peak load multiplied by the regional Planning Reserve Margin. This doesn't align with the adequacy risks MISO is experiencing in its current operating environment, nor the adequacy risks that are predicted to occur in the future. A new process is needed to align the LSE obligation to the risks the system is experiencing.



MISO's strawman solution seeks to allocate the PRMR to LSEs more commensurate to their contribution to reliability risk

Issues with the Existing Process

1. No current method to submit data proactively against shifting risk profile
2. LOLE demand \neq PRA demand
 - Process changes add complexities to the true-up
3. LOLE risk occurs in extreme conditions (i.e. 90/10 load), but an LSE's obligation is based on expected (50/50) load
 - Collection of an LSE's load during high risk is difficult due to the abnormal nature of the condition

Strawman Solution

- Develop a process which better aligns a LSE's obligation with the risk experienced by the system
 1. Measure an LRZ's load during times of Loss of Load events in the LOLE study to calculate the LRZ's share of the PRMR
 2. LSE allocation of LRZ share would be based on look back period consistent with accreditation
 3. Modify true-up of LOLE demand vs PRA demand
- May require a change in the data LSEs need to submit

MISO's proposed strawman solution would allocate the PRMR based on contribution to reliability risk

Existing Process

LRZ	CPF	PRM %	UCAP PRMR*	% of Total PRMR
1	10,000	7%	10,700	35.7%
2	6,000	7%	6,420	21.4%
3	12,000	7%	12,840	42.9%
MISO	28,000	7%	29,960	100%

Proposed Strawman

LRZ	Load (DLOL)	% of MISO	DLOL PRMR**	Net Change in PRMR
1	10,500	36.2%	10,846	146
2	5,800	20%	5,992	(428)
3	12,700	43.8%	13,122	282
MISO	29,000	100%	29,960	0



$$\text{LRZ UCAP PRMR} = \text{LRZ CPF} * \text{PRM}\%$$

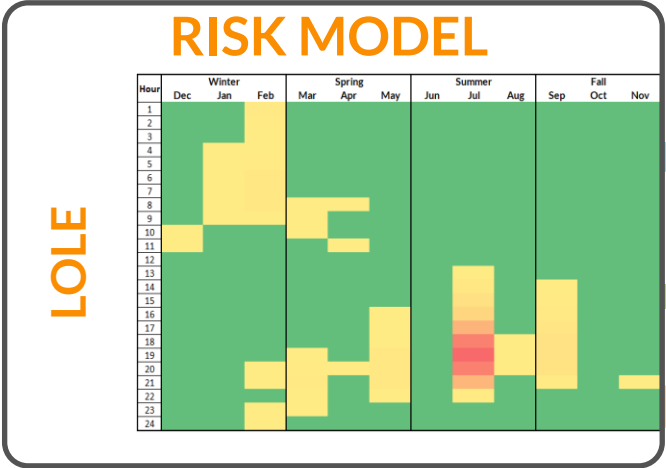
ILLUSTRATIVE EXAMPLE
assumes UCAP PRMR = DLOL PRMR



$$\text{LRZ DLOL PRMR} = (\text{LRZ DLOL Load} / \text{MISO DLOL Load}) * \text{MISO DLOL PRMR}$$

LSE allocation of LRZ PRMR would be based on accreditation look back period

The planned reforms better leverage the risk model, with future modeling improvements naturally driving more efficiency in the outcomes



- Future Enhancements**
- Fuel Limitations
 - Correlated outages
 - Unit modeling (ramp, notification time, etc.)
 - Extreme weather

Accreditation

Current

- Thermal units - UCAP and performance during risky hours
- Wind- Average ELCC

Future

- Availability during highest risk hours in the probabilistic models
- Past performance for unit level

Planning Reserve Margin Requirement

Current

- Requirement based on peak

Future

- Based on risky hours

Translation to PRA

Current

- Percentage based

Future

- MW based, TBD

KEY: ELCC = Effective Load Carrying Capability
 LOLE = Loss of Load Expectation



Next Steps

Next Steps:

- Provide Market Participants resource level accreditation values with requirements
- Revised Resource Accreditation whitepaper will be posted by 9/1
- MISO is planning a September workshop on LOLE modeling and to continue discussion related to PRMR
- Share results related to DLOL results for the expanded fleet (e.g., current fleet + higher solar penetration)
- A FERC filing for Resource Adequacy accreditation reforms is targeted for Q4 2023

Stakeholder Feedback Request

- MISO requests written feedback by September 8, 2023, on the following:
 - PRMR strawman proposal
 - Posted Schedule 53 Tariff redlines
- Issue Tracking ID#: RASC2019-2, RASC2020-4
- Feedback requests and responses are managed through the Feedback Tool on the MISO website: <https://www.misoenergy.org/stakeholder-engagement/stakeholder-feedback/>



Contact Information

Davey Lopez:
dlopez@misoenergy.org

Appendix

Installed Capacities by Resource Class

ICAP (MW)	Spring	Summer	Fall	Winter
Gas	64,821	63,823	64,065	67,708
Coal	44,299	43,990	44,004	44,280
Hydro	2,179	2,175	2,174	2,179
Nuclear	12,064	12,037	12,052	12,212
Pumped Storage	2,649	2,565	2,565	2,451
Solar	12,159	4,738	6,337	11,080
Wind	28,260	25,632	25,944	28,260
Battery	58	30	30	58
Run of River	966	966	966	966