

IRM Model Recommendation: *Maintaining Operating Reserve at Load Shedding*

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ICS Meeting # 260

May 4, 2022

Background

- **In the 2023 IRM study, the NYISO proposes to maintain a level of operating reserves (“OR”) during load shedding events, reflecting the need to protect the bulk power system against volatility during emergency operations**
 - The current IRM modeling assumes all operating actions are exhausted prior to load shedding
 - In reality, operators are required to maintain a certain level of Operating Reserve to manage volatility on the system, even during the time of an emergency
 - It is prudent for the IRM study to reflect the operating reality that some level of OR needs to be maintained at load shedding, to set the appropriate requirement in meeting the 0.1 event days per year LOLE Criterion
- **The NYISO tested maintaining three levels of 10-minute OR at load shedding, and demonstrated that the IRM would increase proportionally to the MW level of maintained OR**
 - The IRM increased by about 1%~3%, based on the MW levels tested in the analysis
- **The ICS requested that the NYISO propose the appropriate level of MW of OR to maintain at load shedding, and the method for allocating reserves by location in the IRM study**

Details about operating reality are presented at 3/2 ICS meeting:

[https://www.nysrc.org/PDF/MeetingMaterial/ICSMeetingMaterial/ICS%20Agenda%20258/AI-9.1%20Operating_Reserve_at%20LoadShedding_IC%202003022022\[3113\].pdf](https://www.nysrc.org/PDF/MeetingMaterial/ICSMeetingMaterial/ICS%20Agenda%20258/AI-9.1%20Operating_Reserve_at%20LoadShedding_IC%202003022022[3113].pdf)

Recommendation and Considerations

The NYISO recommends maintaining **350 MW** of 10-minute OR at the time of load shedding in the 2023-2024 IRM study. The distribution of the maintained OR would follow the current allocation of 10-minute OR in the IRM model.

Considerations:

- The 350 MW recommendation is based on the current system load variability on 10-minute interval during the summer Peak Load Window (PLW)
 - The NYISO’s regulation requirements are based on 5-minute variability on the system ([Current Regulation Requirements](#))
 - The regulation requirements are established based on the forward-looking net load level
 - The current requirements went into effect in 2020 and the maximum requirement during the summer months is 275 MW
 - During emergency operations, load shedding is implemented within 10 minutes.
 - The NYISO assessed the system variability on a 10-minute interval during the PLW of the summer months, with the data and methodology consistent with the current regulation requirements.

10-Min Load Variability (MW) during the Summer PLW (With 99.7% Confidence Level)	June	July	August
	307	346	315

- NYISO recommends a value of 350 MW in the 2023-2024 IRM study as the minimum requirement for maintaining OR at the time of load shedding

Recommendation and Considerations (con't)

- The NYISO recommends that the methodology for allocating the maintained OR by location be based on the current IRM model to maintain consistent impact on the zonal level
 - The current allocation of 10-min OR in the IRM model and the recommended allocation of the 350 MW maintained OR are showed as table below:

Current 10-Minute OR EOP 8			Distribution of the Recommended 350 MW OR at Load Shedding	Recommended Modeling of 10-Minute OR at EOP 8 - With Maintaining 350 MW OR at Load Shedding
Zone		MW (%)		
Upstate	NY_F	518 (40%)	138	380
	NY_G	314 (24%)	84	230
Downstate	NY_J	358 (37%)	96	262
	NY_K	120 (9%)	32	88
<u>TOTAL</u>		<u>1310</u>	<u>350</u>	<u>960</u>

Recommendation and Considerations (con't)

- Based on the previous study results, the recommended 350 MW of maintained OR for load shedding would increase the IRM by about 1.2%
- Maintaining OR for load shedding should be considered as a standard study assumption for the IRM model and should be reviewed and updated during each study cycle.
- When new information and insight emerges, updates to this study assumption should be considered.
 - For example, when the penetration of renewable resources increases, system regulation requirements are expected to increase, and hence the maintained OR at the time of load shedding is also expected to increase
- Continue to monitor critical events and reliability best practices to assess if maintaining additional OR in future IRM Studies is prudent.

Next Steps

- **If the recommendation is accepted for the 2023-2024 IRM Study**
 - Model maintaining OR for load shedding in the Preliminary Base Case based on the accepted recommendation
 - Conduct a special sensitivity case without maintaining OR (historical modeling)
 - Adopt the modeling of maintaining OR at the time of load shedding in the Final Base Case
- **Beyond the 2023-2024 IRM, review and update the assumption of maintaining OR at the time of load shedding during each IRM study cycle**
 - Update the MW level when the NYISO's regulation requirements are updated
 - Review the allocation of the maintained OR and determine changes if necessary
 - Monitor experience from other jurisdictions and evaluate potential changes if applicable

Questions?

Appendix – LOLH and EUE Statistics

- The LOLH and EUE statistics related to the previous study results are included for informational purposes

Tan45 Results		2022 FBC with Neptune Outage	Maintain 327.5 MW OR at Load Shedding	Maintain 500 MW OR at Load Shedding	Maintain 655 MW OR at Load Shedding
Allocation of 10-min OR (MW)	NY_F	518	388.5 (-129.5)	320.3 (-197.7)	259 (-259.0)
	NY_G	314	235.5 (-78.5)	194.2 (-119.8)	157 (-157.0)
	NY_J	358	268.5 (-89.5)	221.4 (-136.6)	179 (-179.0)
	NY_K	120	90 (-30.0)	74.2 (-45.8)	60 (-60.0)
IRM		19.6%	20.7% (+1.1%)	21.5% (+1.9%)	22.2% (+2.6%)
J_LCR		80.7%	81.9%	82.4%	82.8%
K_LCR		99.8%	101.0%	101.4%	101.8%
NYBA EOP		38.4	37.9	37.5	37.2
LOLH and EUE Statistics*					
LOLH		0.341	0.345	0.347	0.352
EUE		207.1	221.4	222.8	226.0

*The LOLH and EUE statistics are directly from GE MARS output

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