New York ISO
Independent System Operator

2027-2028 Installed Reserve Margin (IRM) Preliminary Base Case (PBC) Tan45 Results

Ava Sealander, Dominic Riendeau-Krause

Resource Adequacy

ICS Meeting #319

August 5, 2026

**Note: Includes typographical correction on Slide 10 to the Load Zone K LCR value in the chart

Agenda

- **Preliminary Base Case Tan45 Results**
  - Load Zone J Tan45 Curves
  - Load Zone K Tan45 Curves
- **Select Tan45 Sensitivity Case Results**
  - No New Generator Inclusion (S07)
  - 2020-2024 Thermal EFORd Data (S08)
- **Impact of preliminary transmission security limit (TSL) floor values**
- **Standard Error Assessment**

New York ISO

2027-2028 IRM: PBC Tan45 Results

Results	2026-2027 IRM FBC (Special Sensitivity Case)	2027-2028 IRM PBC Tan45	Delta
IRM	25.6%	30.8%	5.2%
Load Zone J	79.9%	85.9%	6.0%
Load Zone K	107.5%	109.9%	2.4%
G-J Locality	89.2%	89.3%	0.1%
NYCA EOP (Days/Yr.)	6.2	5.2	-1.0
Winter Risk %	14.8%	9.1%	-5.7%
URM*	8.3%	10.3%	2.1%

*Unforced reserve margin (URM) represents the reserve margin expressed in terms of Unforced Capacity (UCAP) rather than Installed Capacity (ICAP). The conversion from ICAP to UCAP is based on the applicable translation factors, which differ between the IRM study model and the capacity market. For IRM studies, translation factors are derived from the generator modeling assumptions used in MARS, including 5-year EFORd values for thermal resources and 5-year availability factors for intermittent resources.

New York ISO

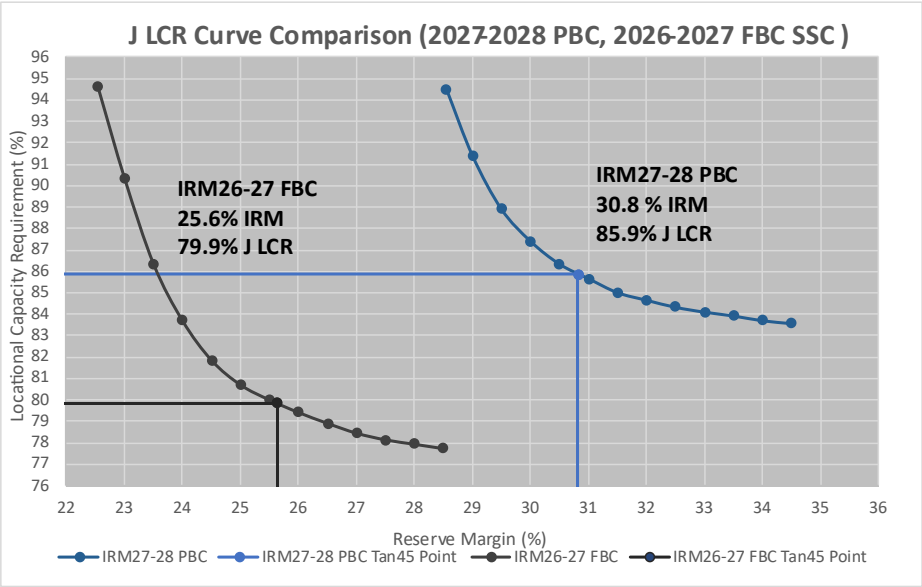
Key Observations

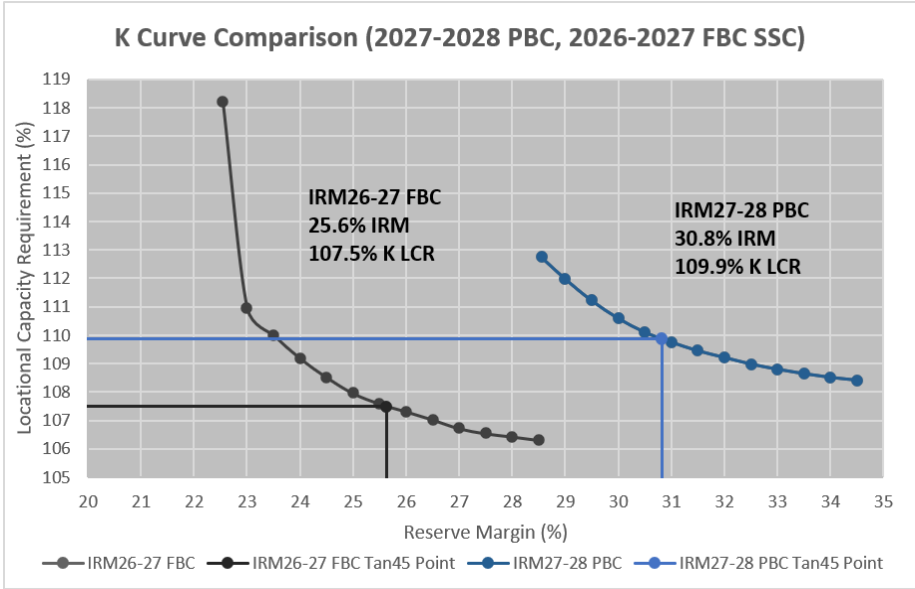
- **The IRM increased by 5.2% relative to the 2026-2027 Final Base Case (FBC).**
  - 3.2% of the increase is attributable to the inclusion of new intermittent resources.[1]
  - 1.1% of the increase is attributable to updated thermal generator performance assumptions (2021-2025 EFORd data).[2]
  - Other drivers include changes in load forecast, load forecast uncertainty, external modeling data, operating reserve assumptions, DMNC changes, etc.
- **Winter reliability risk decreased relative to the prior study year.**
  - A 5.7% reduction in winter risk was observed, primarily due to increased modeled fuel availability.[3]
- **The URM increased by 2.1% relative to the 2026-2027 FBC.**
  - This change is within the historical range of year over year changes to the UCAP requirement.[4]
  - The primary drivers of the increase are consistent with those observed for the IRM impact: new generator inclusion (+0.9%) and updated thermal generator performance assumptions (+0.8%) informed by sensitivity case assessments (see following slides).

[1] New Generation Inclusion Screening 2027-2028 IRM PBC
[2] Generator Transition Rate Matrices: Impact Analysis
[3] Winter Fuel Availability Constraints Modeling: Final Recommendations
[4] Historic NYCA Capacity Parameters

New York ISO

Load Zone J and K Tan45 Curves





New York ISO

Impact of New Generator Inclusion

Results	2027-2028 IRM PBC S07 *	2027-2028 IRM PBC Tan45	Delta
IRM	27.6%	30.8%	3.2%
Load Zone J	85.5%	85.9%	0.4%
Load Zone K	110.0%	109.9%	-0.1%
G-J Locality	89.1%	89.3%	0.3%
URM	9.4%	10.3%	0.9%

- **The 2027-2028 IRM PBC includes 1,229 MW of new generation additions, of which 1,119 MW are renewable resources located in Load Zones A and B.[5]**
  - The additions consist of 339 MW of wind in Load Zone A, 780 MW of solar in Load Zone B, 10 MW of energy storage in Load Zone C, and 100 MW of energy storage in Load Zone J.
- **Although 1,229 MW of new generation ICAP was added, only 216 MW of ICAP is removed to restore LOLE, resulting in a net increase of approximately 1,013 MW in the ICAP requirement.**
  - The new resources contribute 428 MW of UCAP. **
  - Restoring the system to 0.1 LOLE requires the removal of 177MW of perfect capacity, which translates to ~216MW of ICAP using zonal UCAP-to-ICAP translation factors.
- **The large IRM impact is consistent with observations from prior NYSRC high-renewable studies.[6]**
  - Additionally, these Tan45 sensitivity results closely resemble the new generation screening parametric results.

[5] New Generation Inclusion Screening 2027-2028 IRM PBC

*A sensitivity analysis that excludes all new generation additions assumed in the 2027–2028 IRM PBC (Sensitivity Case S07).

** This UCAP reflects applicable derating and availability assumptions and does not represent perfect capacity.

[6] High Renewables Phase 2 Results (fig. 1)

New York ISO

Impact of Updated Thermal EFORd Data

Results	2027-2028 IRM PBC S08	2027-2028 IRM PBC (Base Case)	Delta
IRM	29.7%	30.8%	1.1%
Load Zone J	83.6%	85.9%	2.3%
Load Zone K	108.4%	109.9%	1.5%
G-J Locality	87.7%	89.3%	1.6%
URM	9.5%	10.3%	0.8%

- **The 2027–2028 IRM PBC incorporates thermal outage rates based on thermal generator EFORd data for the years 2021–2025, replacing the 2020–2024 dataset.**
  - The 2025 data reflects a higher frequency and duration of outage events recorded that year relative to the 2020 data that was rolled off from the five-year dataset.[7]
  - The increase in forced outage hours was concentrated in Load Zones G-K.
- **To isolate the impact of the thermal outage rate update, the NYISO conducted a sensitivity analysis that excludes this year's thermal outage rate update assumptions (Sensitivity Case S08).**
  - Consistent with the 2027–2028 IRM PBC assumptions, this sensitivity uses PowerGADS as the source of thermal generator outage data.
- **The Tan45 results for Sensitivity Case S08 indicates that the thermal outage rate update results in a 1.1% increase in the IRM.**

[7] Generator Transition Rate Matrices: Impact Analysis

New York ISO

TSL Floor Values Assessment

- **The NYISO presented preliminary TSL floor values for the 2027–2028 Capability Period at the 6/22/2026 ICAP Working Group meeting. [8]**
  - Preliminary Summer and Winter TSL floor values were calculated with the Summer TSL floor values being the more binding ones.
- **The NYISO recommends evaluating the potential impact of TSL floor values as part of the PBC and FBC Tan45 analyses.**
  - The most recent preliminary TSL floor values that have been presented to NYISO stakeholders, pending finalization, will be used for this assessment.
  - The evaluation shall assume locational requirements equal to the TSL floor values and use the NYISO's LCR Optimizer for capacity adjustments.
  - Two studies were conducted for the 2027-2028 IRM PBC analysis:
    - IRM PBC with Preliminary 2027-2028 Summer TSL Floors (Tan45 IRM + TSL Floor) with IRM fixed at the value determined by the PBC Tan45 analysis; and
    - IRM PBC Alternative with Preliminary 2027-2028 Summer TSL Floors (IRM + TSL Floor (At-Criteria)) with the IRM treated as a variable and solved by the LCR Optimizer while meeting the 0.100 LOLE criteria

Summer Transmission Security Limit	Formula	G-J	NYC	LI	Notes
Non-Coincident Load Forecast (MW)	[A] = Given	15,460	11,117	5,176	[1]
Bulk Power Transmission Limit (MW)	[B] = Studied	4,525	2,475	275	[2]
Net Flow Adjustment (MW)*	[N] = Study Assumption	275	0	0	[3]
Offshore Wind (MW)	[O] = Given	0	0	64.0	[4]
UCAP Requirement (MW)	[C] = [A]-[B]+[N]+[O]	11,210	8,642	4,965	
UCAP Requirement Floor	[D] = [C]/[A]	72.5%	77.7%	95.9%	
5-Year DF, Current	[E] = Given	10.90%	8.04%	14.20%	[5]
Special Case Resources (MW)	[F] = Given	526.9	453.0	23.1	[6]
ICAP Requirement (MW)	[G] = ([C]/(1-[E]))+[F]	13,108.7	9,851.0	5,809.9	
ICAP Requirement Floor (%)	[H] = [G]/[A]	84.8%	88.6%	112.2%	

[1] 2026 Gold Book Forecast Incorporating BTM:NG Resource Loads
[2] 2026 Locality Bulk Power Transmission Capability Report
[3] LI Bulk Power Transmission Limit Adjustment
[4] Difference in Resource Adequacy and Transmission Security UCAP Valuation
[5] Preliminary 5-year DF inclusive of 9300 events
[6] July SCR ICAP from 26-27 IRM FBC

Winter Transmission Security Limit	Formula	G-J	NYC	LI	Notes
Non-Coincident Load Forecast (MW)	[A] = Given	11,020	7,767	3,365	[1]
Bulk Power Transmission Limit (MW)	[B] = Studied	4,363	2,916	240	[2]
Net Flow Adjustment (MW)*	[N] = Study Assumption	240	0	0	[3]
Offshore Wind (MW)	[O] = Given	0	0	50.8	[4]
UCAP Requirement (MW)	[C] = [A]-[B]+[N]+[O]	6,897	4,851	3,176	
UCAP Requirement Floor	[D] = [C]/[A]	62.6%	62.5%	94.4%	
5-Year DF, Current	[E] = Given	10.64%	7.88%	14.24%	[5]
Special Case Resources (MW)	[F] = Given	360.2	309.7	15.8	[6]
ICAP Unavailable Fuel Constraints	[P]= Studied	4,130	2,395	826	
ICAP Requirement (MW)	[G] = ([C]/(1-[E]))+[F]+[P]	12,208.7	7,971.2	4,545.1	[7]
ICAP Requirement Floor (%)	[H] = [G]/[A]	110.8%	102.6%	135.1%	

[1] 2026 Gold Book Incorporating BTM:NG Resource Loads
[2] 2026 Q1 STAR
[3] LI Bulk Power Transmission Limit Adjustment
[4] Difference in Resource Adequacy and Transmission Security UCAP Valuation
[5] Preliminary 5-year DF inclusive of 9300 events
[6] January SCR ICAP from 26-27 IRM FBC
[7] Preliminary Firm Fuel Derates 27-28 IRM

[8] Seasonal Transmission Security Limit (TSL) Floor Value Considerations and Preliminary Recommendations

New York ISO

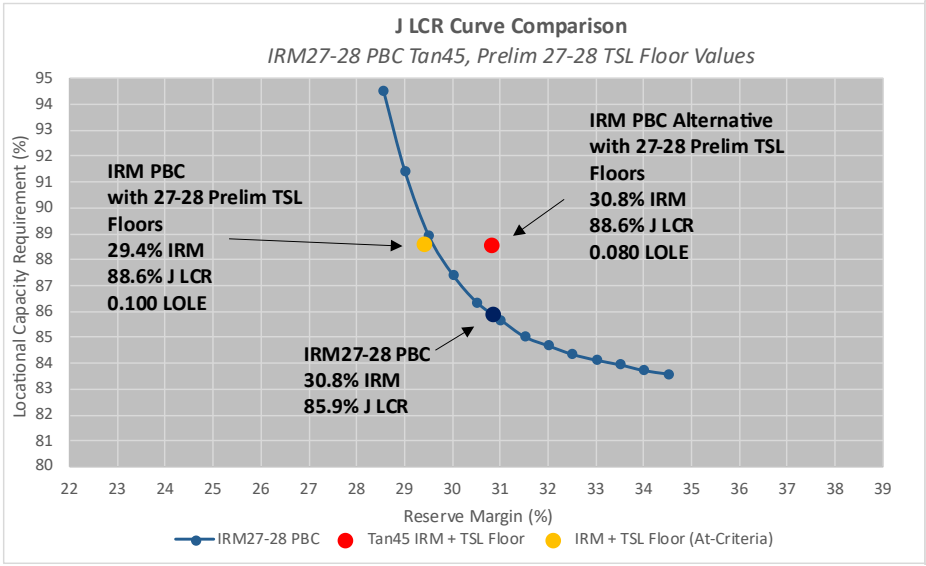
Impact of TSL Floor Values

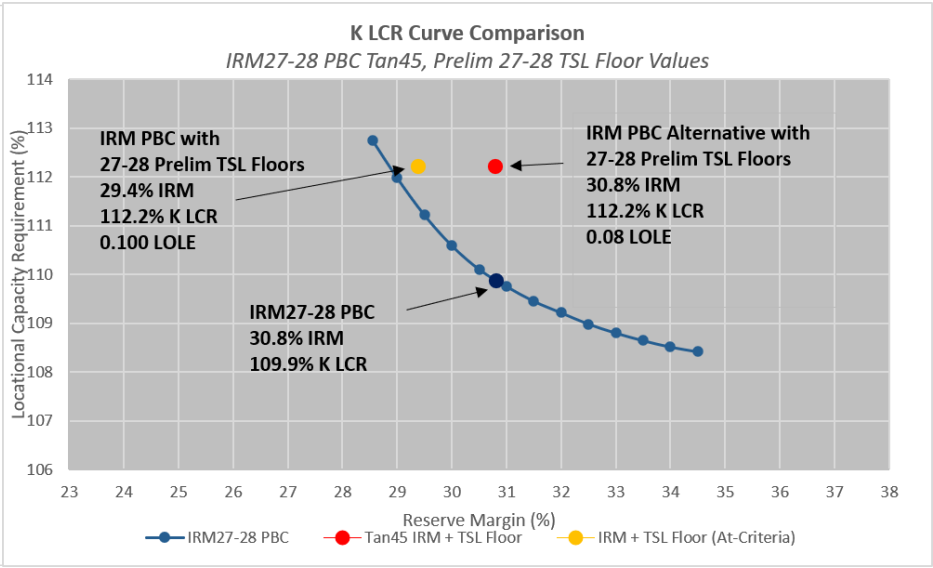
TSL Floor Impact	Case	G-J Locality	Load Zone J	Load Zone K	IRM	LOLE
2027-2028 IRM PBC	Tan45	89.3%	85.9%	109.9%	30.8%	0.100
	Tan45 IRM + TSL Floor	84.8%	88.6%	112.2%	30.8%	0.080
	IRM + TSL Floor (At-Criteria)	84.8%	88.6%	112.2%	29.4%	0.100

- By adjusting the LCRs to respect the preliminary TSL floor values while maintaining the IRM from Tan45 results, the LOLE decreases from 0.100 to 0.080.
- By adjusting the LCRs to respect the preliminary TSL floor values while maintaining the LOLE at criteria, the IRM decreases by 1.4%.
- Compared to the 2026–2027 final TSL floor values and the IRM FBC, the gap between the preliminary 2027–2028 TSL floor values and the IRM PBC Tan45-determined locational requirements is smaller.

New York ISO

Tan45 Curves with TSL Floor Values





- The preliminary 2027-2028 TSL floor assessment points do not lie directly on the Tan45 curve because the 0.100 LOLE criterion can be satisfied by more than one combination of Load Zone J and Load Zone K capacity requirements.

New York ISO

Standard Error Assessment

- **Under Policy 5, Section 3.8,* the standard error of the IRM study should be less than 0.05 of the mean LOLE**
  - "…the ICS has determined that the desired standard error value for the mean [LOLE] shall be less than or equal to 0.050 at the final iteration at three critical points; a) the beginning of the IRM Study; b) at the conclusion of the [PBC] prior to the Tan 45 process; and c) at the conclusion of the [FBC] prior to the Tan 45 process."
- **At 3,000 replications, the standard error at the conclusion of the PBC prior to the Tan45 process was 0.04**
- **In addition, the relative standard error was also evaluated at the ends of the following studies:**
  - 2027-2028 IRM PBC Tan45 solution point: 0.035
  - 2027-2028 IRM PBC Tan45 IRM + TSL Floor: 0.026
  - 2027-2028 IRM PBC IRM + TSL Floor (At-Criteria): 0.031

* Policy 5 Revision 20 as approved by the NYSRC Executive Committee on 07/17/2026.
https://www.nysrc.org/wp-content/uploads/2026/07/4.1.10-NYSRC-Draft-Policy-5-20-Draft-2026-07012026-Clean-and-Redline-Attachment-4.1.10.pdf

New York ISO

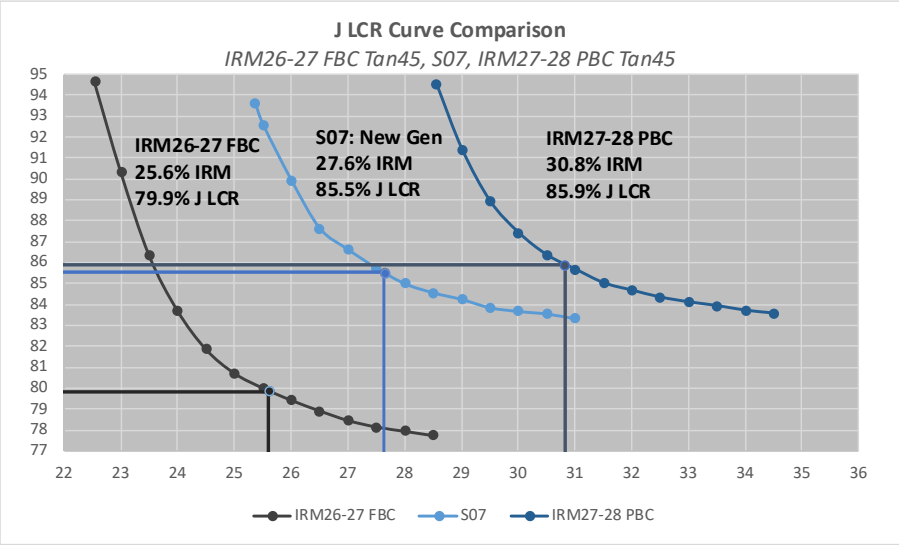
Questions?

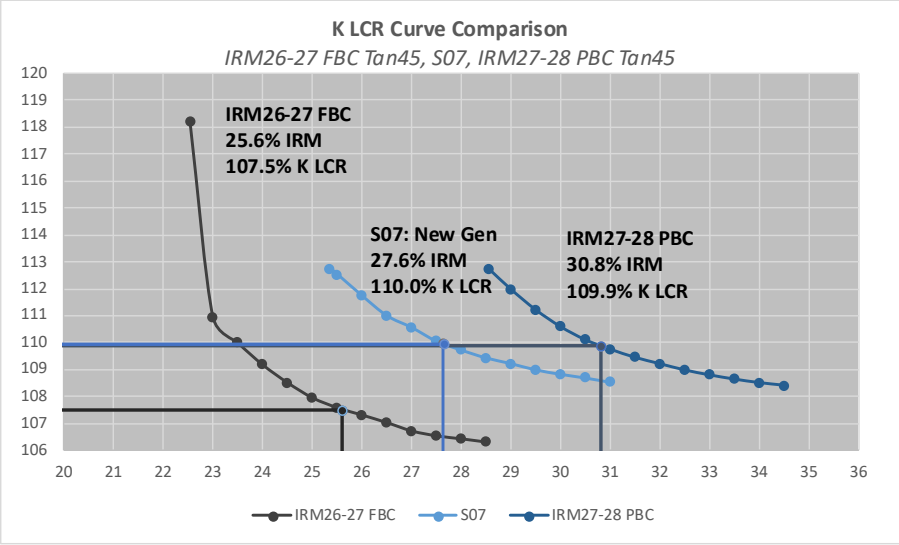
New York ISO

Appendix

New York ISO

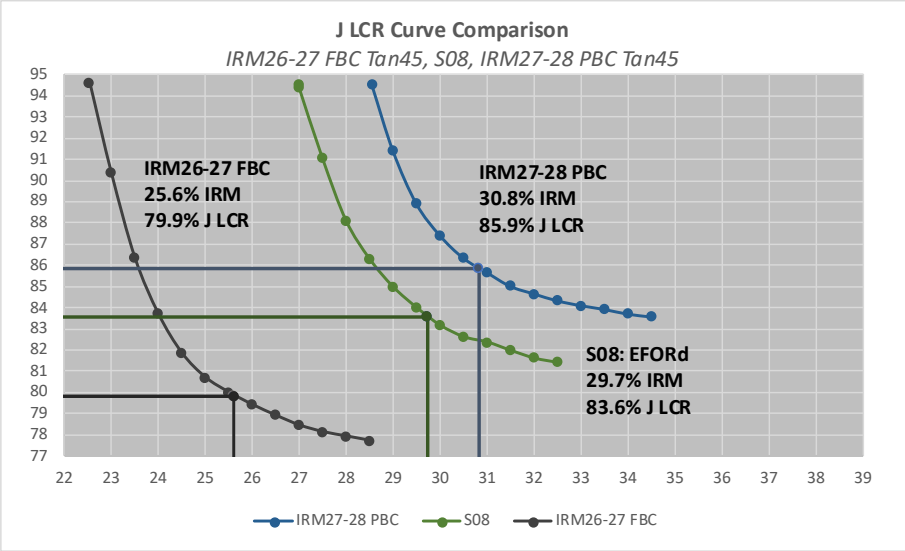
New Generator Sensitivity (S07) - Results

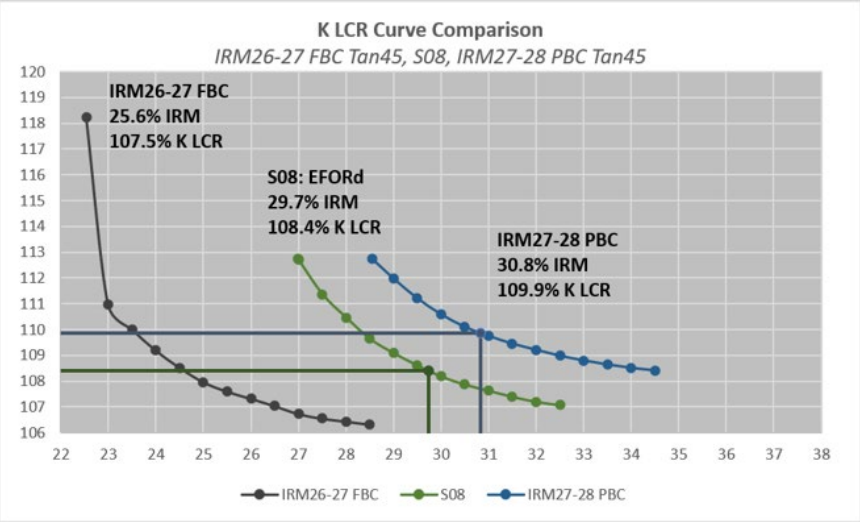




New York ISO

Thermal EFORd Data (S08) - Results





New York ISO

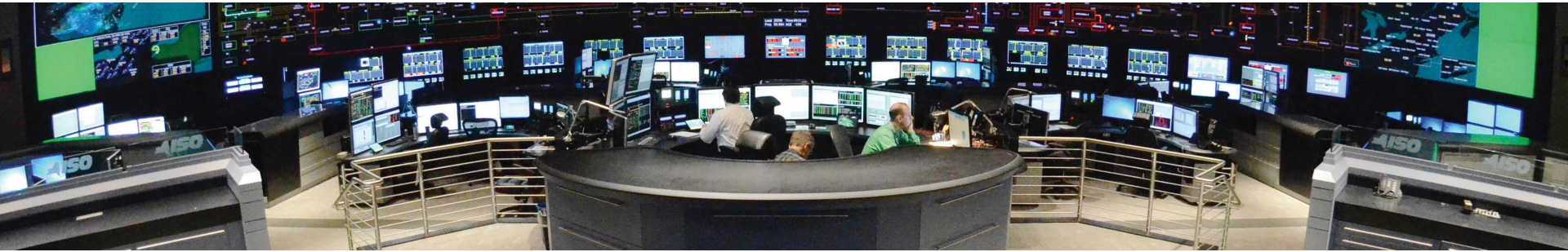
Our Mission and Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation



New York ISO