2024 – 2025 IRM
EOP Whitepaper Recommendation Sensitivity Case #6a-b

Mikaela Lucas
NYISO

ICS Meeting #281

August 29, 2023

Background

- The purpose of the EOP whitepaper is to research how EOPs, especially Emergency Assistance ("EA"), are accounted for in the IRM study, and recommend changes that are appropriate
- At 8/2 ICS, the NYISO presented the initial recommendation for the EOP Whitepaper
- ICS requested the EOP Whitepaper recommendation to be added to the sensitivity case list for the 2024-2025 IRM study.
  - Sensitivity item #6a: Full Tan45 with the initial recommendation
  - Sensitivity item #6b: Parametric analysis with no winter assistance – built on top of #6a

The initial recommendation was presented at 8/2 ICS meeting:
https://www.nysrc.org/wp-content/uploads/2023/08/EOP_Whitepaper_Preliminary_Recommendations_08022023_v1020949.pdf

Cases

- **Sensitivity Case #6a – Initial Recommendation (Additional EA topology limits for both Summer and Winter)**

Area	Bin 1	Bin 2	Bin 3	Bin 4	Bin 5	Bin 6	Bin 7
IESO	550 MW	660 MW	750 MW	860 MW	No additional limits (1950/2100 MW)		
ISONE	50 MW	540 MW	1,000 MW	1,530 MW	No additional limits (1804 MW)		
PJM	580 MW	1,110 MW	No additional limits (1412 MW)				
HQ	No additional limits (280/1162 MW)						
Total	1,470 MW	2,600 MW	No additional limits (3500 MW)				

- **Sensitivity Case #6b – No Winter Assistance (Built on top of #6a)**
  - Due to the runtime issue with Gas Constraint Whitepaper sensitivity cases (Case #7a-d), gradual restriction of the winter EA limits by bin was implemented
    - The gradual restriction by bin does not yield different results compared to zeroing-out all the winter EA limits
    - The table below shows the additional winter EA topology limits implemented for this study

Area	Bin 1	Bin 2	Bin 3	Bin 4	Bin 5	Bin 6	Bin 7
IESO	0 MW		No additional limits (2100 MW)				
ISONE	0 MW				No additional limits (1804 MW)		
PJM	0 MW				No additional limits (1412 MW)		
HQ	0 MW				No additional limits (1162 MW)		
Total	0 MW		No additional limits (3500 MW)				

New York ISO

IRM Sensitivity Results

Results

Results	2024 PBC (Tan45)	#6a - Initial Recommendation (Tan45)	*Delta % (ICAP) from PBC*	#6b - No Winter Assistance (Parametric)	*Delta % (ICAP) from #6a*
IRM	20.800%	23.043%	*+2.243% (+727.9 MW)*	23.043%	*0% (0.0 MW)*
J LCR	72.719%	72.405%	*-0.314% (-35.5 MW)*	72.405%	*0% (0.0 MW)*
K LCR	109.880%	109.524%	*-0.356% (-18.1 MW)*	109.524%	*0% (0.0 MW)*
GRP G-J	84.252%	84.022%	*-0.230% (-35.5 MW)*	84.023%	*+0.001% (0.0 MW)*
NYBA EOP (Days/Year)	7.552	6.158	*-1.394*	6.158	*0.000*

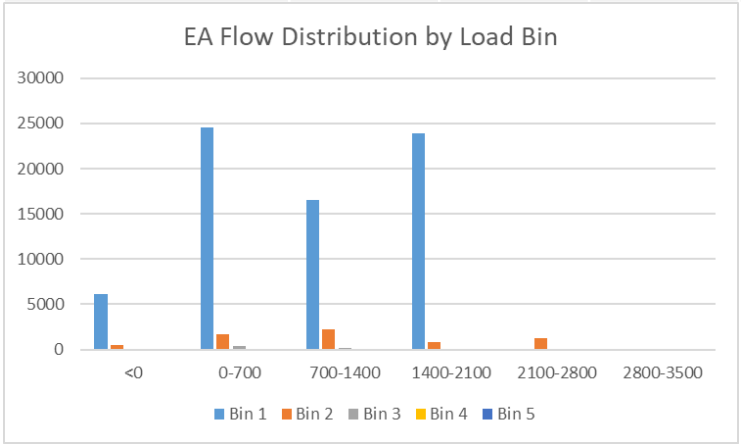
Case	LOLE	LOLH	Normalized LOEE (EUE) "Simple Method" ppm	Normalized LOEE (EUE) "Bin Method" ppm
2024 Preliminary Base Case	0.100	0.337	1.188	1.031
Initial Recommendation (#6a)	0.100	0.368	1.498	1.292

New York ISO

Distribution of EA during Loss of Load (2024-2025 PBC Sensitivity Case #6a)

- **When NYCA needs external assistance, the assigned maximum EA flow level is reached during Bin 1 and 2, but do not always require the maximum level of assistance**
  - During Bin 1 and 2, NYCA needs the assigned maximum EA level, 21% and 12% of the time, respectively
  - During Bin 3 and 4, NYCA does not reach it's maximum EA level of 3,500 MW
    - Maximum observed flow:
      - Bin 3: 2,740 MW
      - Bin 4: 920 MW
  - During Bin 1, EA flows are dispersed across the flow range
  - During Bin 2, EA flows are concentrated between 0 MW – 1,400 MW
  - During Bin 3 and 4, EA flows are concentrated between 0 MW – 700 MW

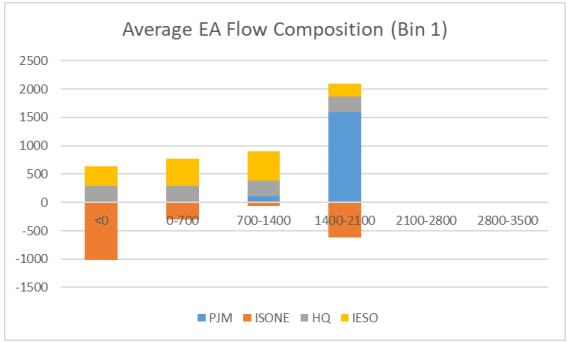
EA Flow Range	Bin 1 (*1,470 MW*)	Bin 2 (*2,600 MW*)	Bin 3 (*3,500 MW*)	Bin 4 (*3,500 MW*)
@ Max EA Level	21%	12%	0%	0%
2,800 MW – 3,500 MW	0%	0%	0%	0%
2,100 MW – 2,800 MW	0%	20%	2%	0%
1,400 MW – 2,100 MW	34%	12%	5%	0%
700 MW – 1,400 MW	23%	35%	30%	10%
0 MW – 700 MW	35%	26%	63%	90%
< 0 MW	9%	7%	0%	0%

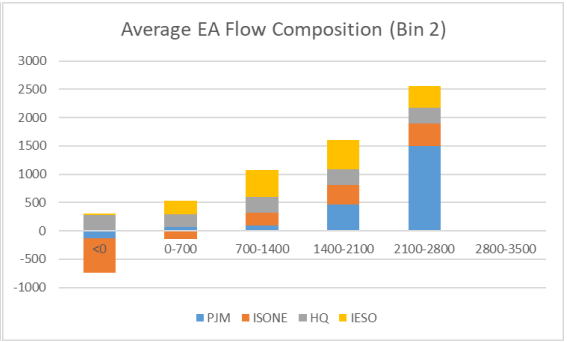


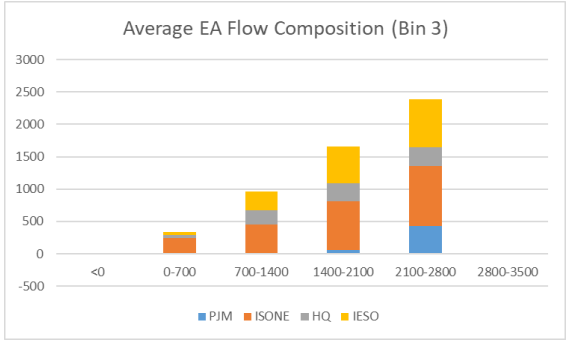
New York ISO

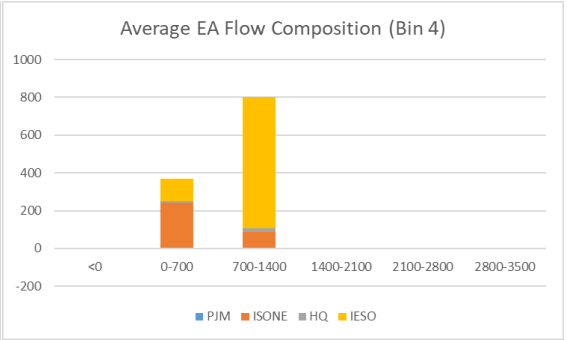
Composition of EA during Loss of Load (2024-2025 PBC Sensitivity Case #6a)

- **On average, NYCA relies on IESO and ISONE the most**
  - NYCA receives consistent EA from IESO
  - NYCA receives higher support from ISONE during less severe conditions
  - During Bin 1-3, the support from HQ is consistent independent of the LFU bin and the flow level
  - During Bin 1 and 2, when NYCA needs higher level of EA, the support from PJM bridges the gap when IESO and ISONE both are likely in the same extreme conditions
  - NYCA often exports to ISONE during severe and extreme conditions
    - Consistent with the historical data from grid operations









New York ISO

Hourly LOLE Distribution

HB	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2024 Preliminary Base Case	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	4%	7%	13%	22%	24%	12%	9%	4%	1%	0%	0%
Initial Recommendation (#6a)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	4%	6%	12%	19%	22%	12%	11%	7%	3%	0%	0%

- **Hourly LOLE Distribution shows the high-risk hours for LOLE concentrated at HB15 - HB18 for both the Preliminary Base Case and the Initial Recommendation**
  - More than 90% of the risk hours are covered within HB14 – HB21 for both the Preliminary Base Case, and with the implementation of the EOP Initial Recommendation
    - Consistent with the ELR modeling recommendation from 8/2 ICS meeting
- **The hourly risk distribution is dispersed slightly to later in the day with the implementation of the Initial EA Recommendation**

ELR modeling presentation (8/2 ICS meeting):
https://www.nysrc.org/wp-content/uploads/2023/08/ELR_ICS_Presentation_Updated0801.pdf

New York ISO

Summary of EA during Loss of Load Event in the 2024-2025 IRM EOP Sensitivity Case

- **With the new EA assumptions, NYCA needs external assistance during Bin 1-5**
  - Upper LFU bins (i.e. more extreme weather conditions) have more EA flow, in both duration and magnitude, compared to lower LFU bins (i.e. milder weather conditions)
    - Bin 4 (50/50 forecast) requires maximum EA of ~900 MW
    - Maximum level of EA is reached for Bin 1 and 2, but not always
- **With the new EA assumptions, NYCA relies mostly on IESO and ISONE on average**
  - Support from PJM increases in upper bins at higher flow level
  - NYCA typically exports to ISONE during severe and extreme conditions
  - HQ consistently provides at close to the maximum interface limit
- **The hourly LOLE distribution is dispersed slightly to later in the day with the implementation of the Initial Recommendation**
  - More than 90% of the risk hours are covered within HB14 – HB21 for both the Preliminary Base Case, and with the implementation of the EOP Initial Recommendation

New York ISO

Next Steps

- **If accepted by the ICS, adopt the recommended EA modeling in the 2024-2025 FBC, by**
  - Adopting the sensitivity case 6a as the starting point for FBC, or
  - Running the initial recommendation modeled in sensitivity case 6a as a separate parametric step in FBC
- **The NYISO aims to periodically review and update EA flow limitations in the IRM study**
- **Finalize the EOP Whitepaper Report for ICS review at 10/4 meeting**

New York ISO

Our Mission & 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

Questions?