California ISO

Updated Analysis on BAA MPM
Price Formation Enhancements

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Summary: Updated data & Algorithm evaluations

- Scope: compared 8 algorithm variants formed by combinations of 3 design factors on updated data set.

- Data: 2025 Q3 (July 1st – Sept 30th)
- Factors:
  - Adjusted grouping algorithm
  - Testing CAISO
  - Adding Load Serving Obligation (LSO) component

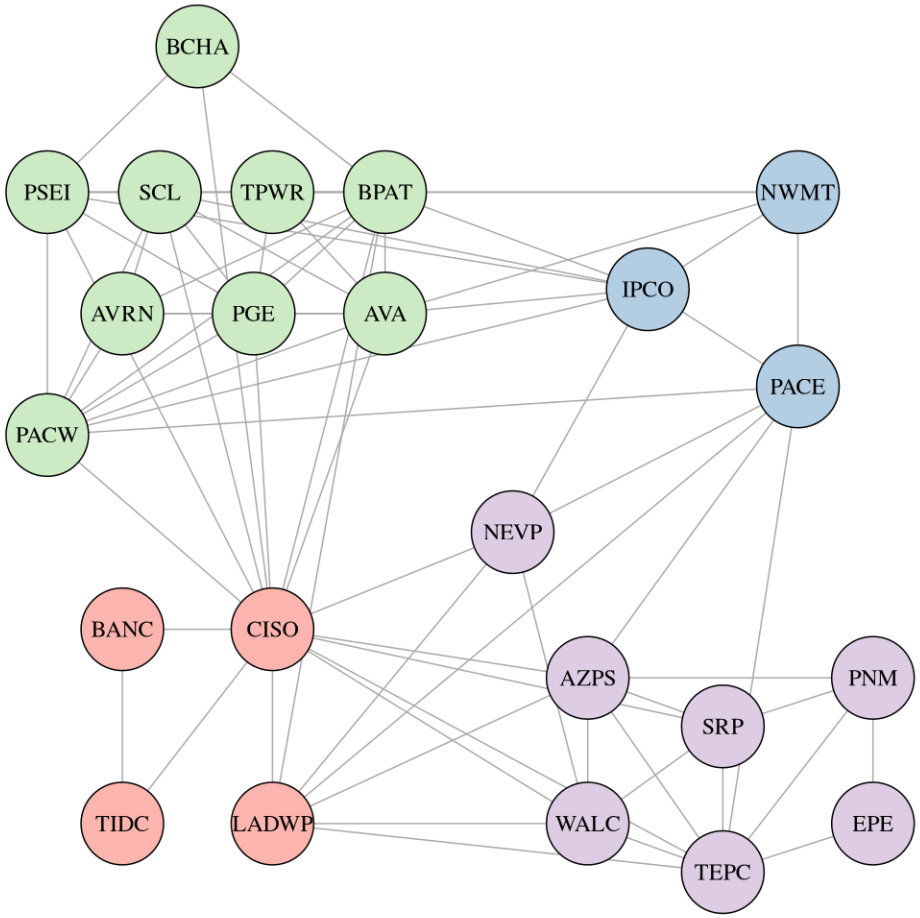
- Algorithm variations

Grouping	Grouping Adjusted
Grp + LSO	Grp Adj + LSO
Grp + test CAISO	Grp Adj + test CAISO
Grp + test CAISO + LSO	Grp Adj + test CAISO + LSO

Grouping algorithm illustration

Counterfactual study

- FMM LMPM results
- Master file registered ETSR mapping is used as the reference for connectivity among BAAs
- Competitive LMP of a passing group is set by the lowest MEC in the group



Grouping algorithm illustration

Example

- Data: 8/11/2025 hour ending 21
- Original result:

  Group 1 failed, group 2 passed

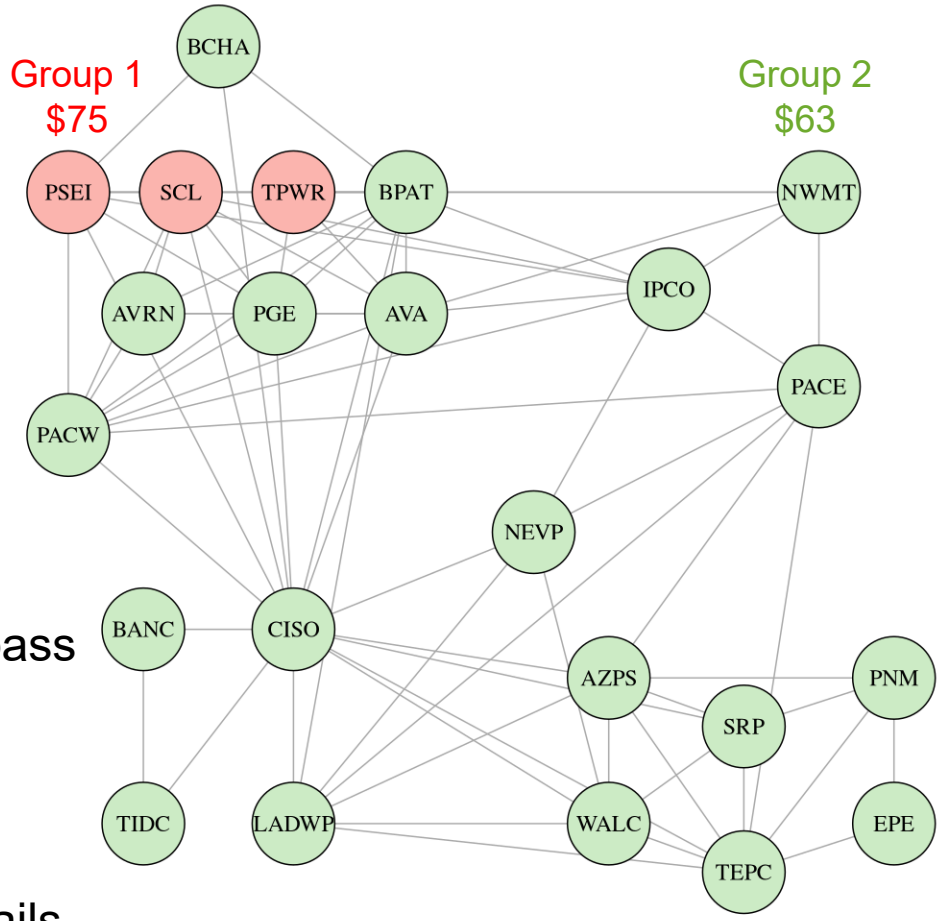
Grouping Algorithm

1) Test group {1}
2) Test group {1, 2}
3) Adjustment:

   If step 2) fails test group {2}

Test variations:

- Grp/Grp Adj: group 1 fail, group 2 pass
- +LSO: both groups pass
- +testCAISO: both groups fail
- +LSO+testCAISO:
  - Grp: group 1 passes, group 2 fails
  - Grp Adj: both groups pass



Adding Load Serving Obligation (LSO) to BAA-MPM test

- Estimated LSO: metered load at DLAP/ELAP/CLAP
- Withheld capacity (WC)

$$WC = S_{max} - S_{min} \Rightarrow \max\{0, S_{max} - \max\{S_{min}, LSO\}\}$$

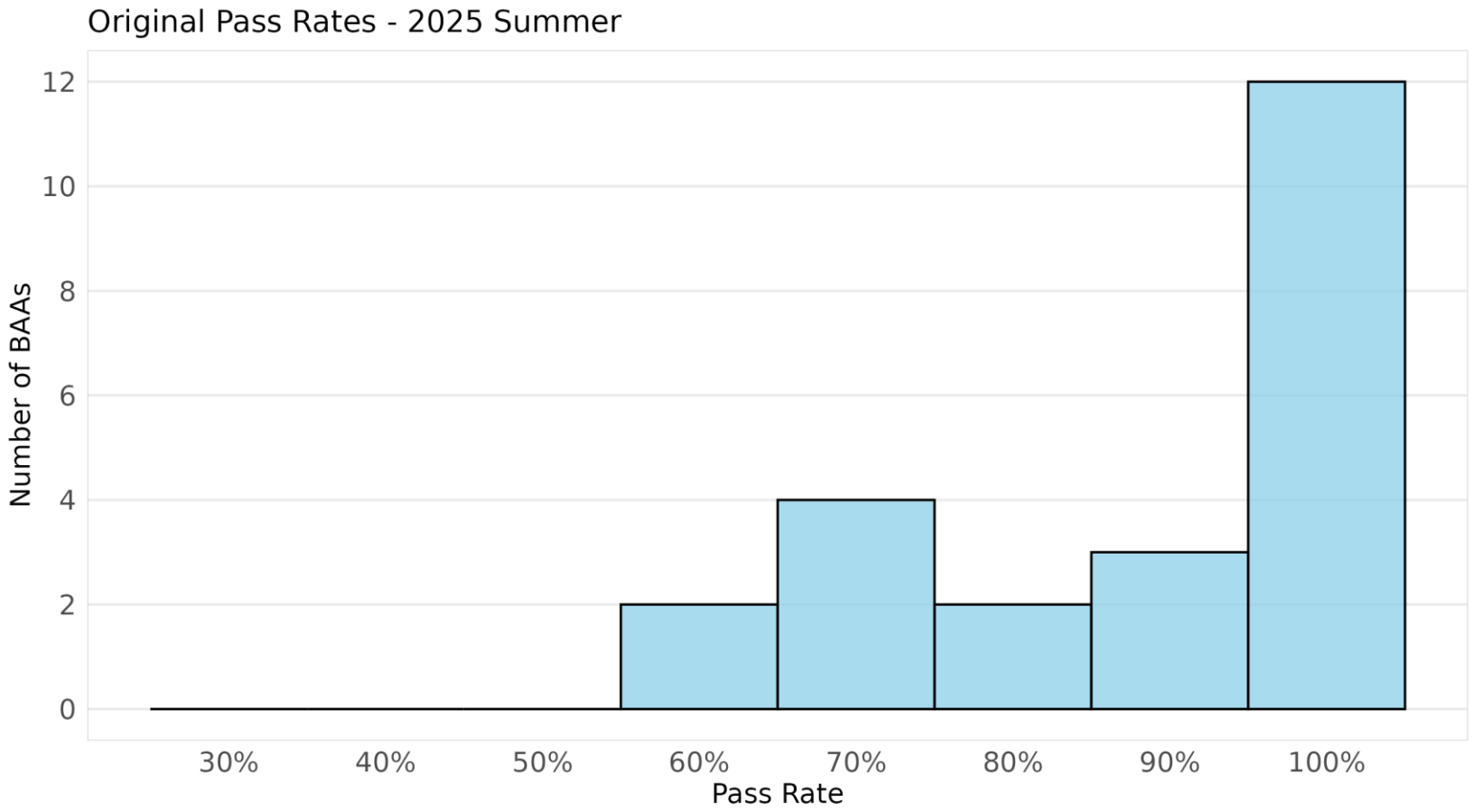
- Residual Supply Index (RSI) formulation

$$RSI_{BAA} = \frac{Supply}{Demand} = \frac{\sum_{i \in FCS} S_{i,max} + Imp + \sum_{j \in PPS} S_{j,min}}{Load + Exp}$$

> Adding LSO component changes *{Supply from PPS}*

$$\sum_{j \in PPS} S_{j,min} \Rightarrow \sum_{j \in PPS} \min\{S_{j,max}, \max\{S_{j,min}, LSO_j\}\}$$

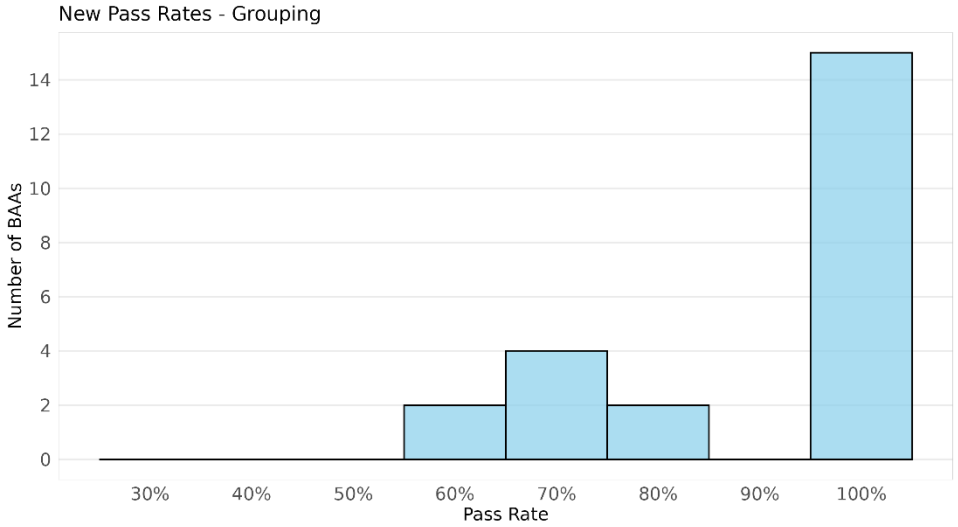
Original pass rates from 2025 summer production: 12 BAAs in ≥ 95% frequency bin.

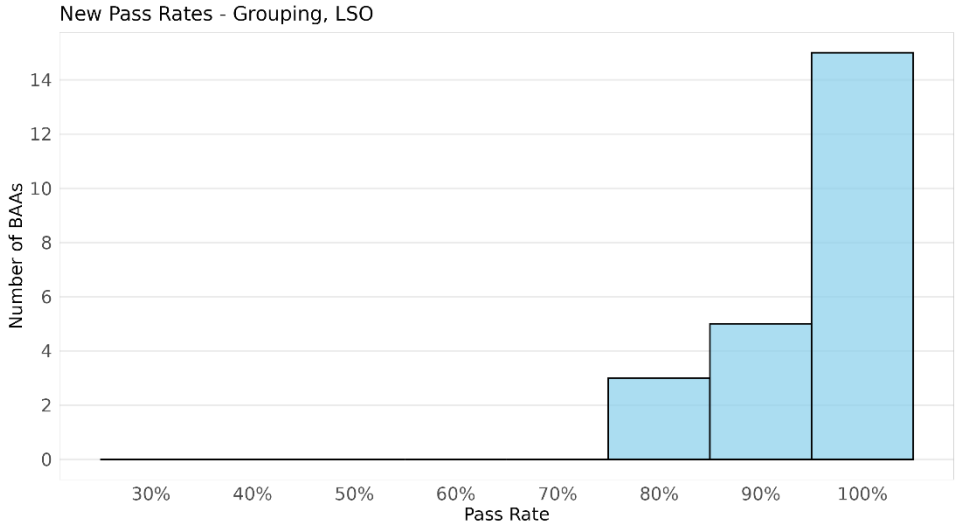


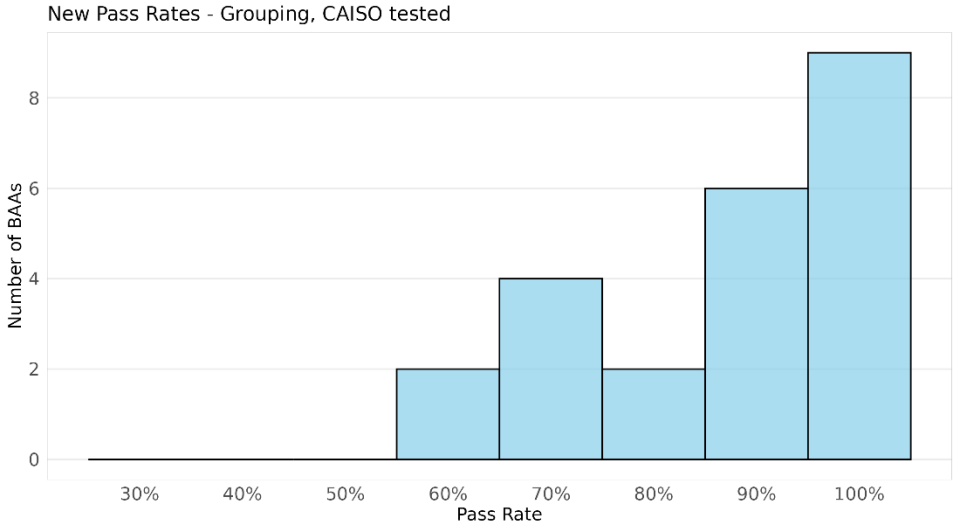
Original 2025 pass rates by BAA, and delta pass rate changes by algorithm variations

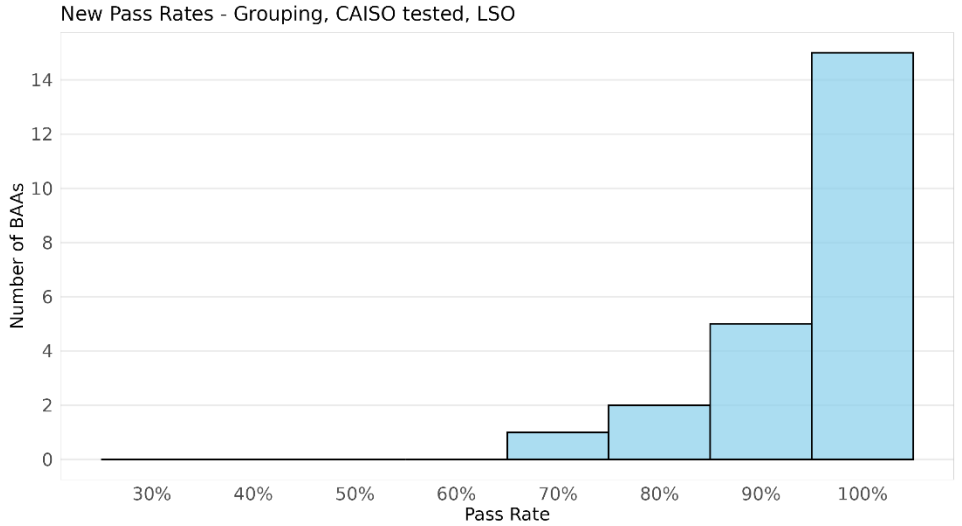
BAA NAME	ORIGINAL	GROUPING	GRP ADJ	GRP, LSO	GRP ADJ, LSO	GRP, testCISO	GRP ADJ, testCISO	GRP, testCISO, LSO	GRP ADJ, testCISO, LSO
AVA	93.4%	2.1%	2.1%	6.6%	6.6%	-1.0%	-1.0%	5.9%	5.9%
AVRN	79.2%	1.7%	1.7%	11.8%	12.1%	-1.4%	-1.4%	11.2%	11.4%
BCHA	60.2%	0.8%	0.8%	15.6%	17.0%	-2.2%	-2.2%	14.8%	16.2%
BPAT	62.6%	1.4%	1.4%	16.0%	16.5%	-1.3%	-1.3%	15.3%	15.9%
PACW	79.2%	1.7%	1.7%	11.8%	12.1%	-1.4%	-1.4%	11.2%	11.4%
PGE	69.7%	1.7%	1.7%	14.2%	14.5%	-1.0%	-1.0%	13.6%	13.9%
PSEI	70.5%	1.5%	1.5%	20.2%	21.4%	-1.2%	-1.2%	19.5%	20.8%
SCL	70.5%	1.6%	1.6%	20.2%	21.3%	-1.2%	-1.2%	19.5%	20.8%
TPWR	70.6%	1.5%	1.5%	19.9%	21.1%	-1.3%	-1.3%	19.3%	20.5%
IPCO	93.5%	2.1%	2.1%	6.5%	6.5%	-1.0%	-1.0%	5.7%	5.8%
NWMT	93.5%	2.1%	2.1%	6.5%	6.5%	-1.0%	-1.0%	5.8%	5.8%
PACE	97.1%	0.9%	0.9%	2.9%	2.9%	-2.2%	-2.2%	2.1%	2.1%
AZPS	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%
EPE	97.8%	0.3%	0.3%	2.2%	2.2%	-2.8%	-2.8%	1.4%	1.5%
NEVP	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%
PNM	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%
SRP	97.2%	0.1%	0.1%	2.7%	2.7%	-3.0%	-3.0%	1.9%	1.9%
TEPC	97.3%	0.3%	0.3%	2.7%	2.7%	-2.8%	-2.8%	1.9%	1.9%
WALC	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%
BANC	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%
CISO	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%
LADWP	99.9%	0.0%	0.0%	0.1%	0.1%	-3.1%	-3.1%	-0.8%	-0.7%
TIDC	100.0%	0.0%	0.0%	0.0%	0.0%	-3.1%	-3.1%	-0.8%	-0.8%

Variations based on original grouping

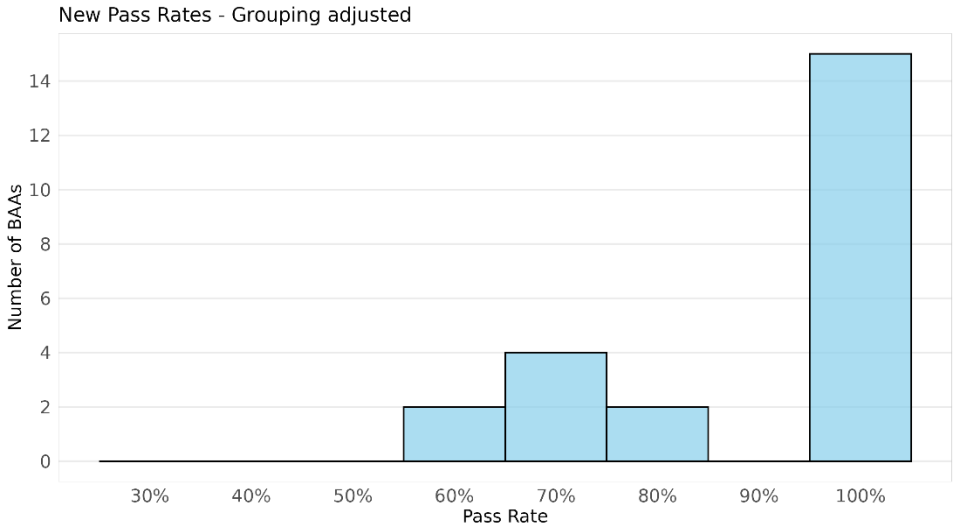


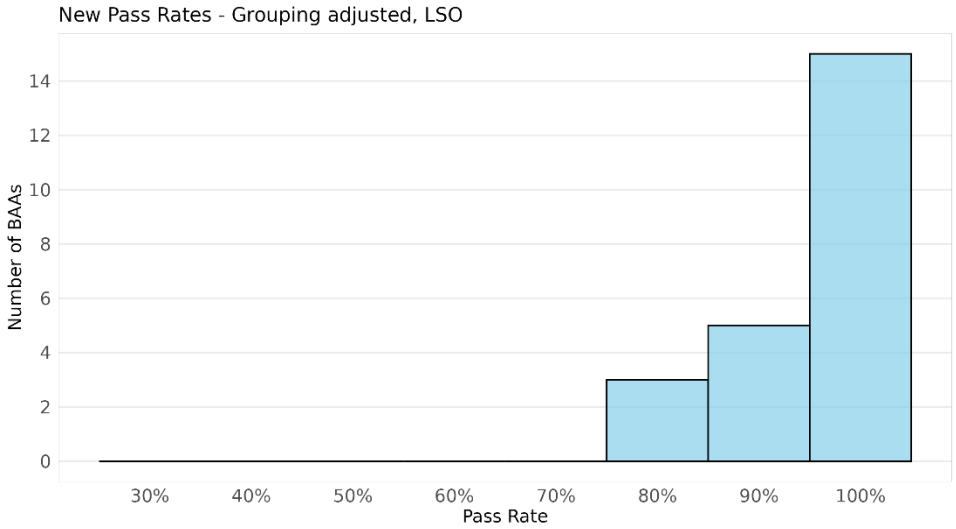


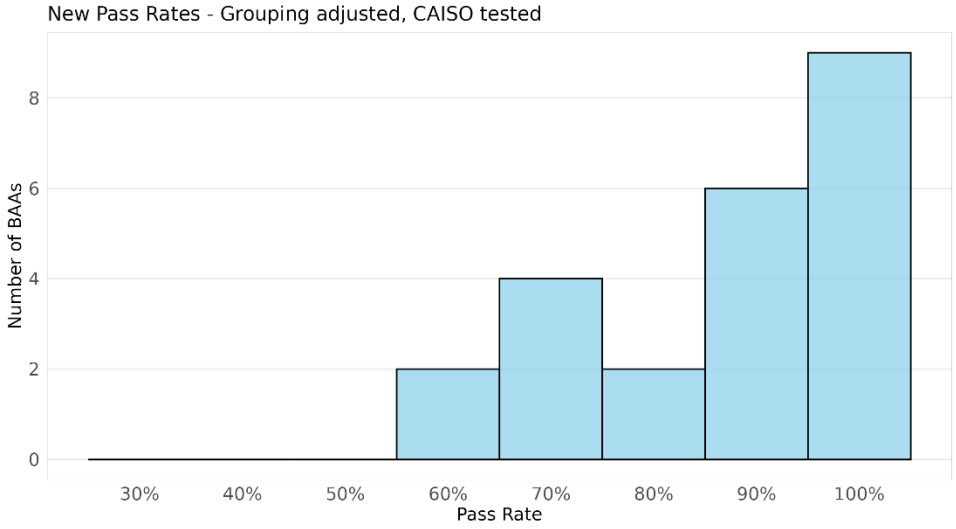


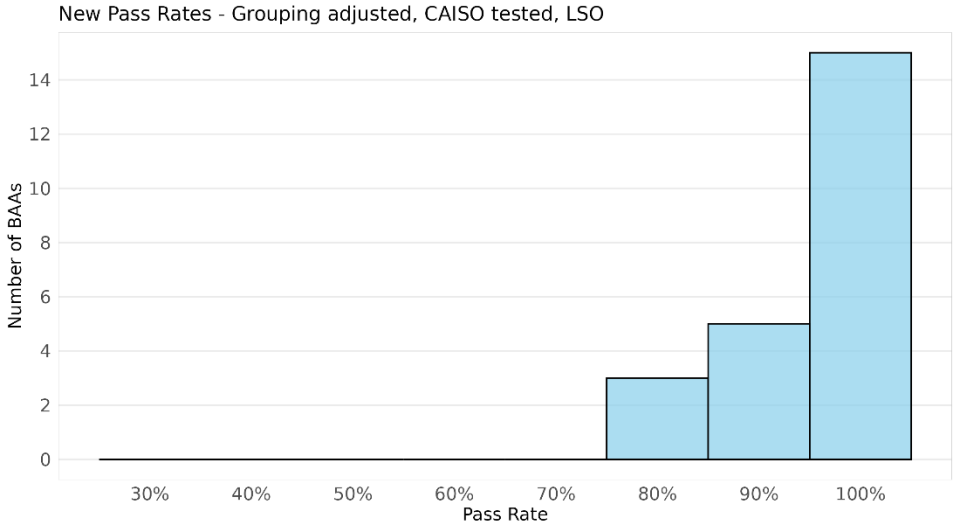


Variations based on adjusted grouping algorithm

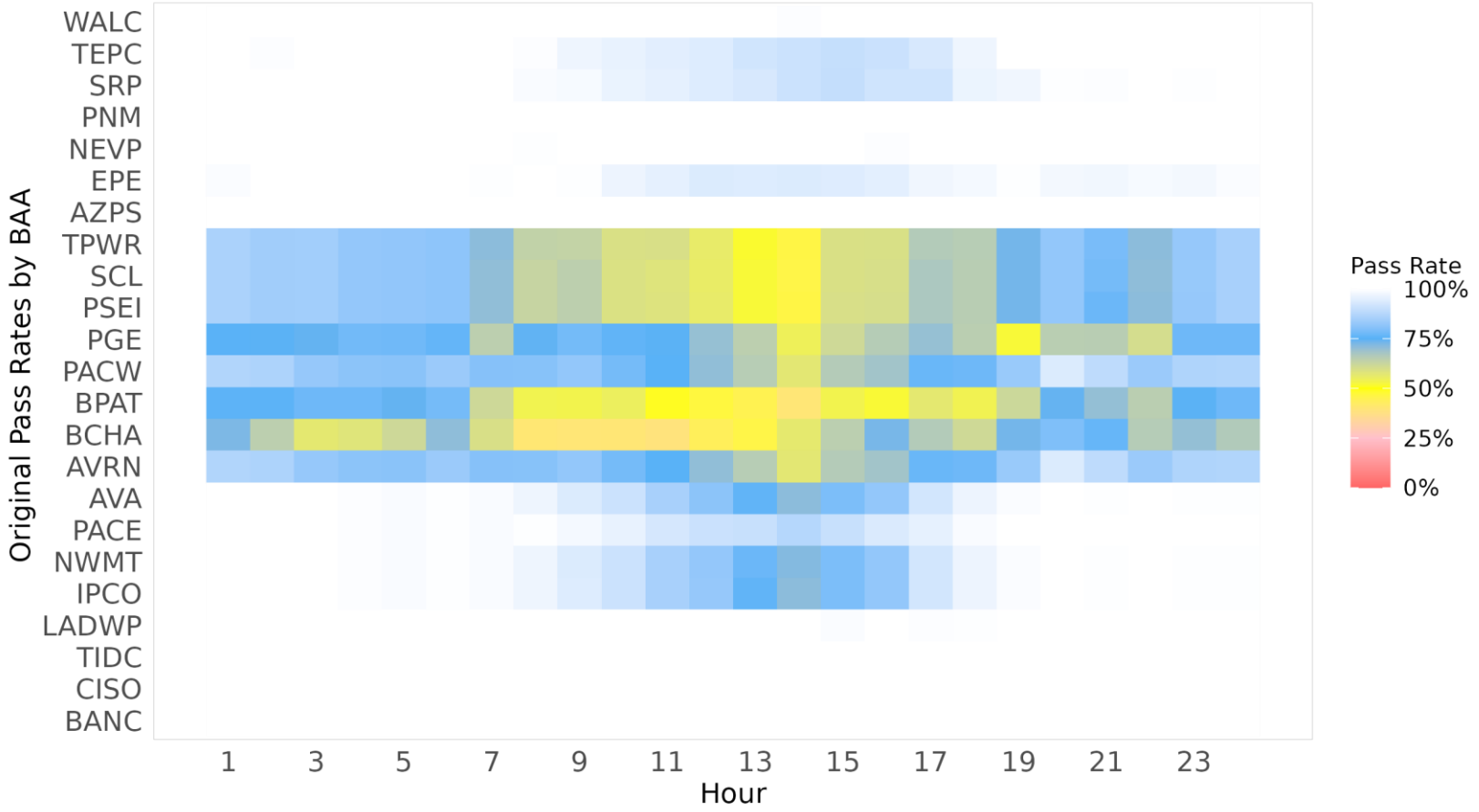




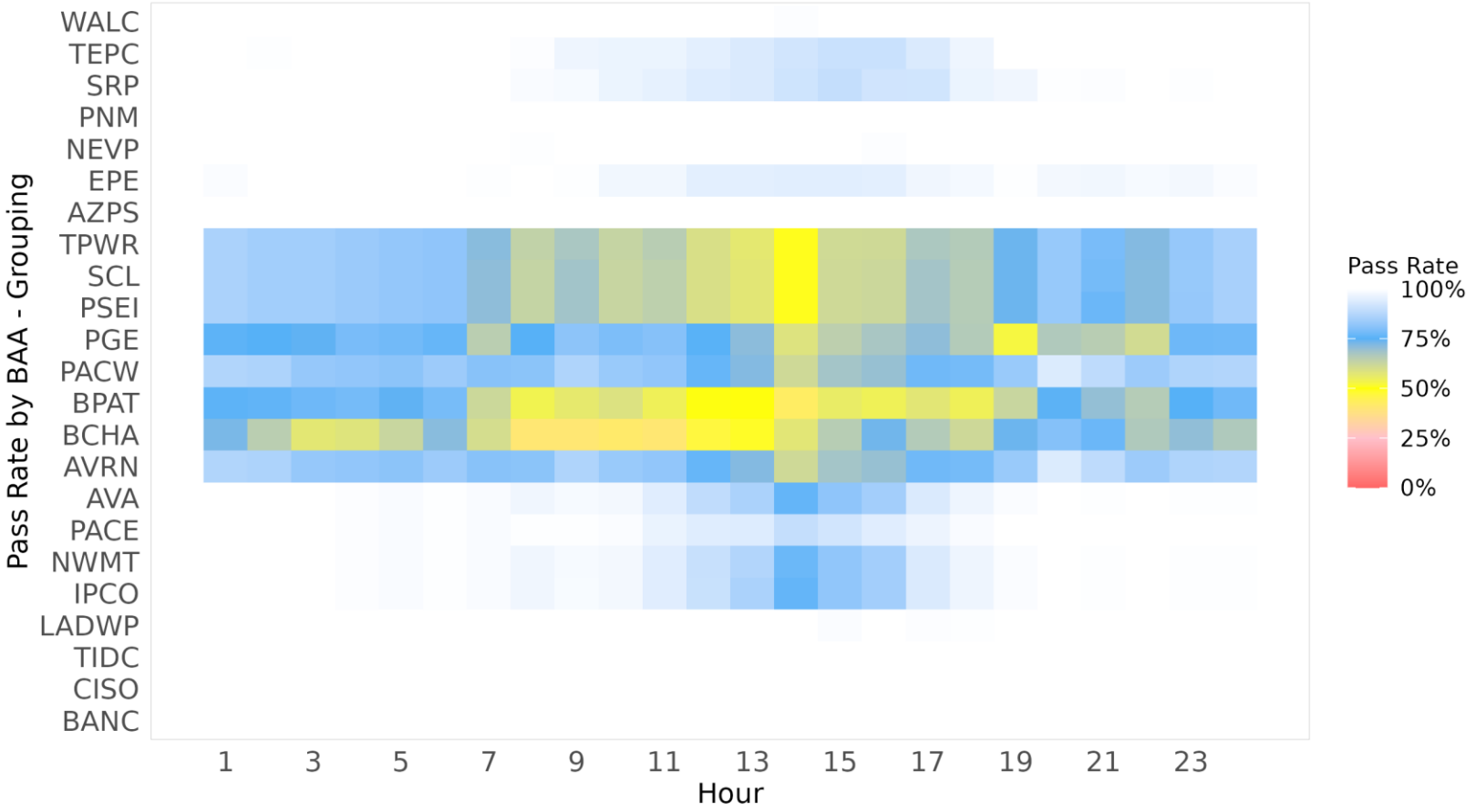




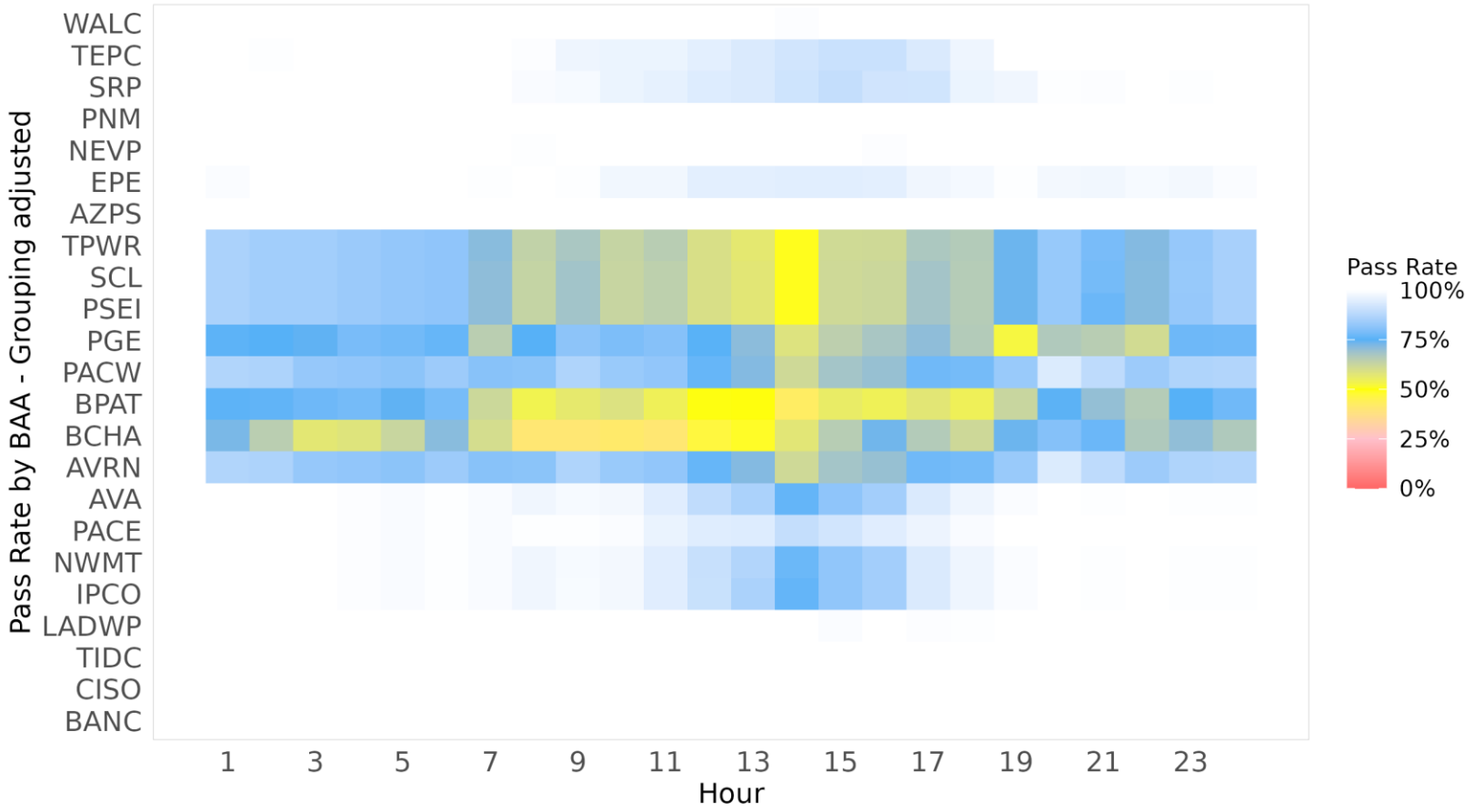
Original pass rate from 2025 summer Production: relatively lower pass rates mainly concentrated in midday hours when BAAs are import constrained.



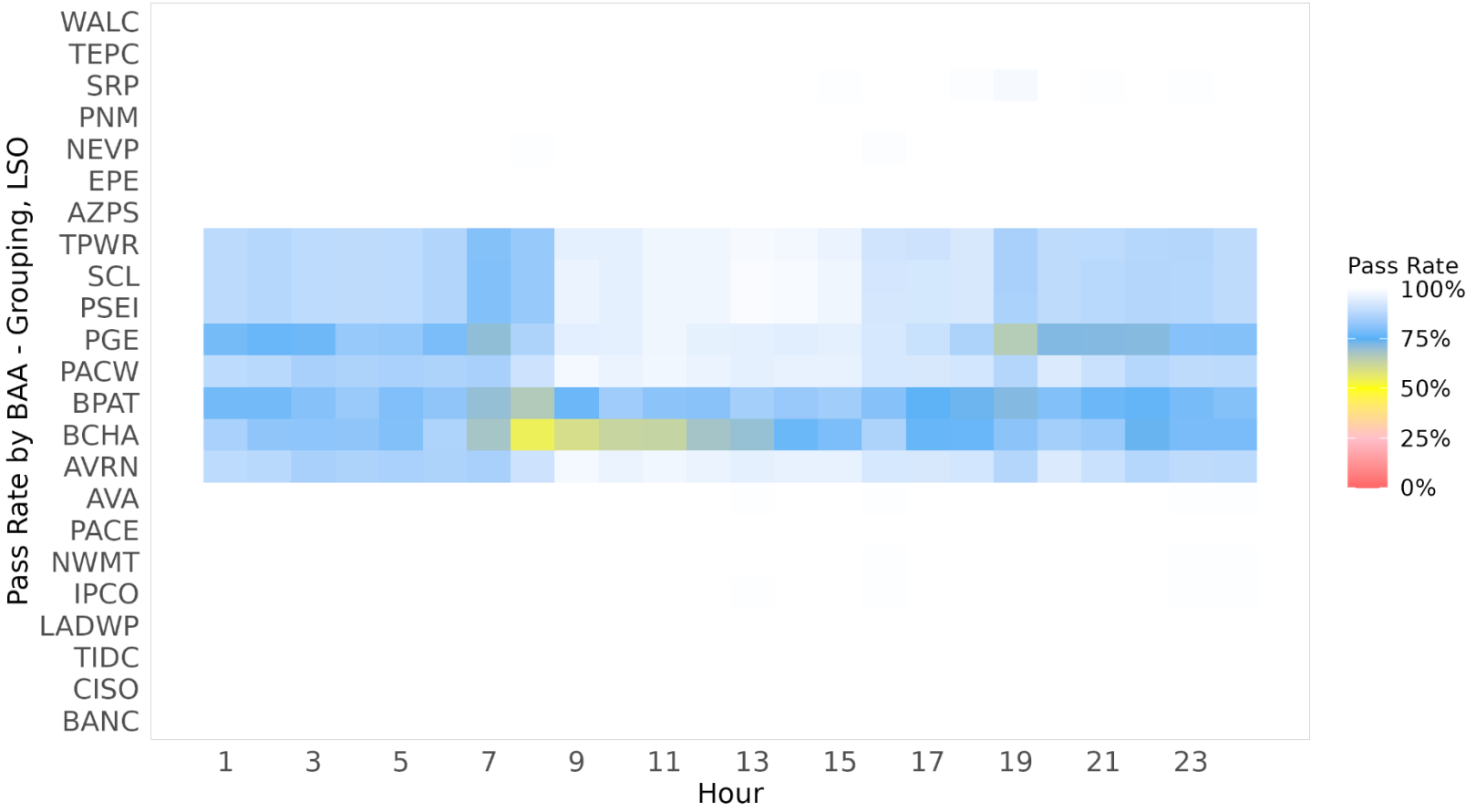
Under the grouping approach, there were increases in pass rates primarily in early morning to midday hours for Pacific Northwest and Central/Mountain regions.



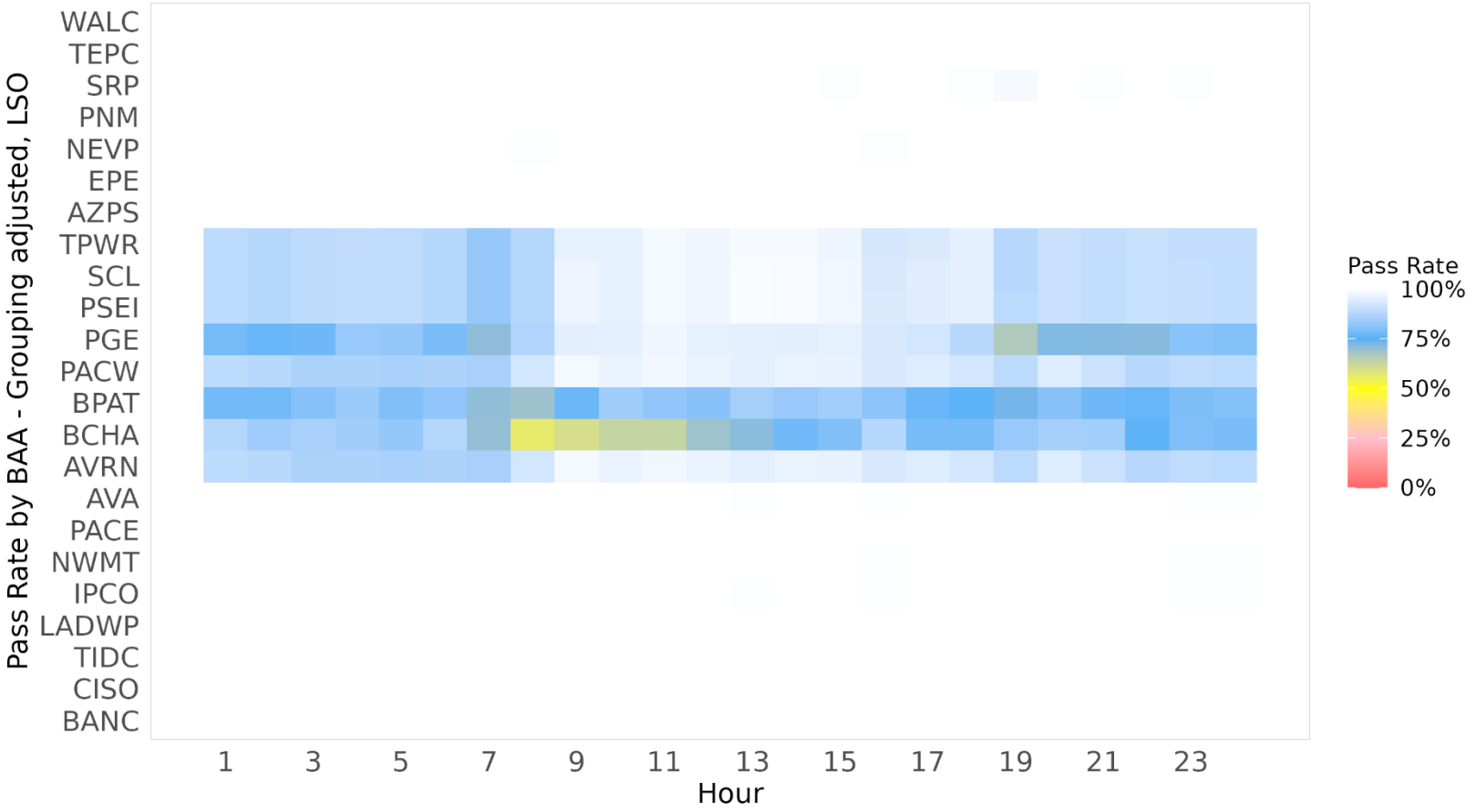
Under the adjusted grouping approach, pass rates largely remained the same as the original grouping approach.



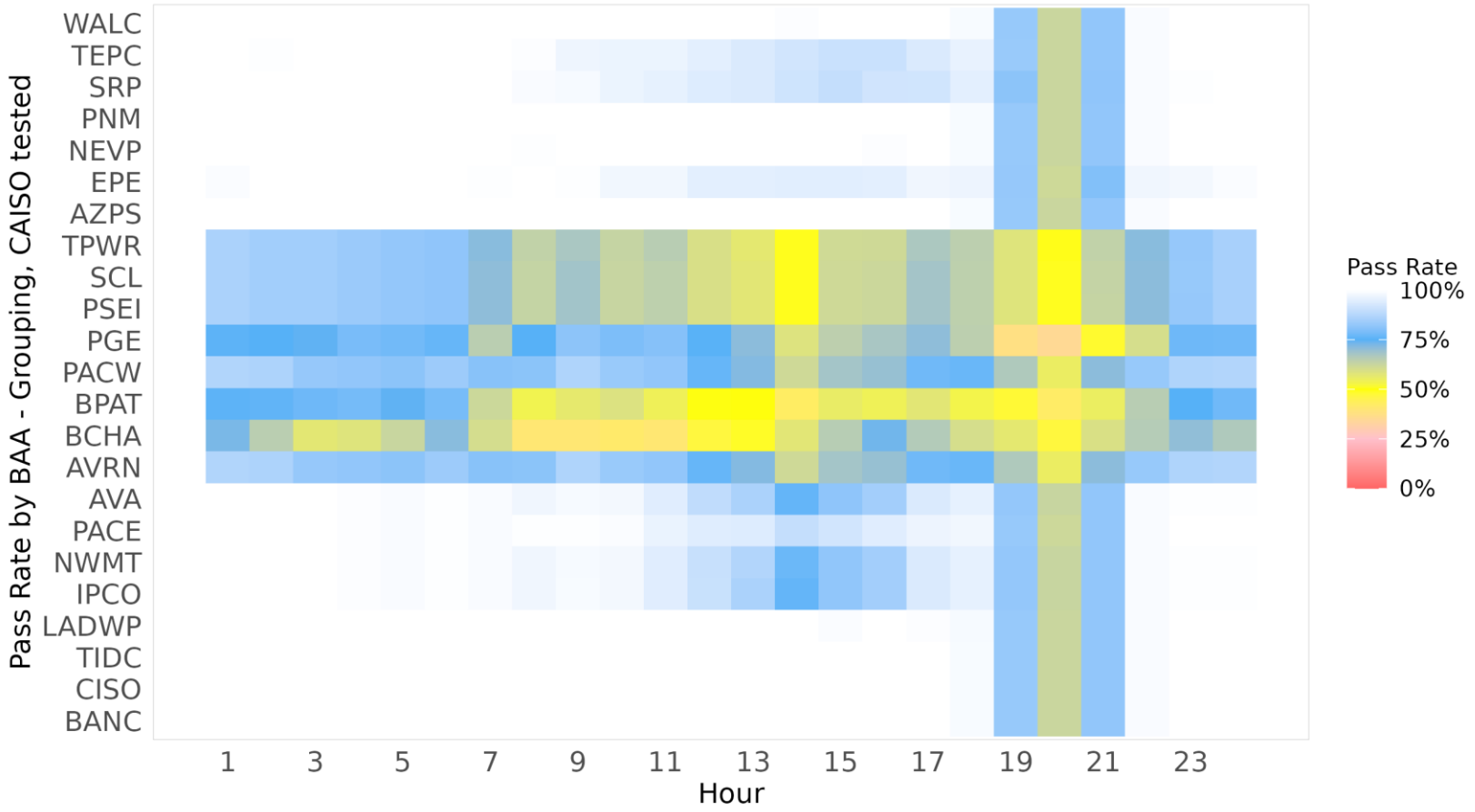
Under grouping approach adding LSO component, pass rates increased for almost all BAAs.



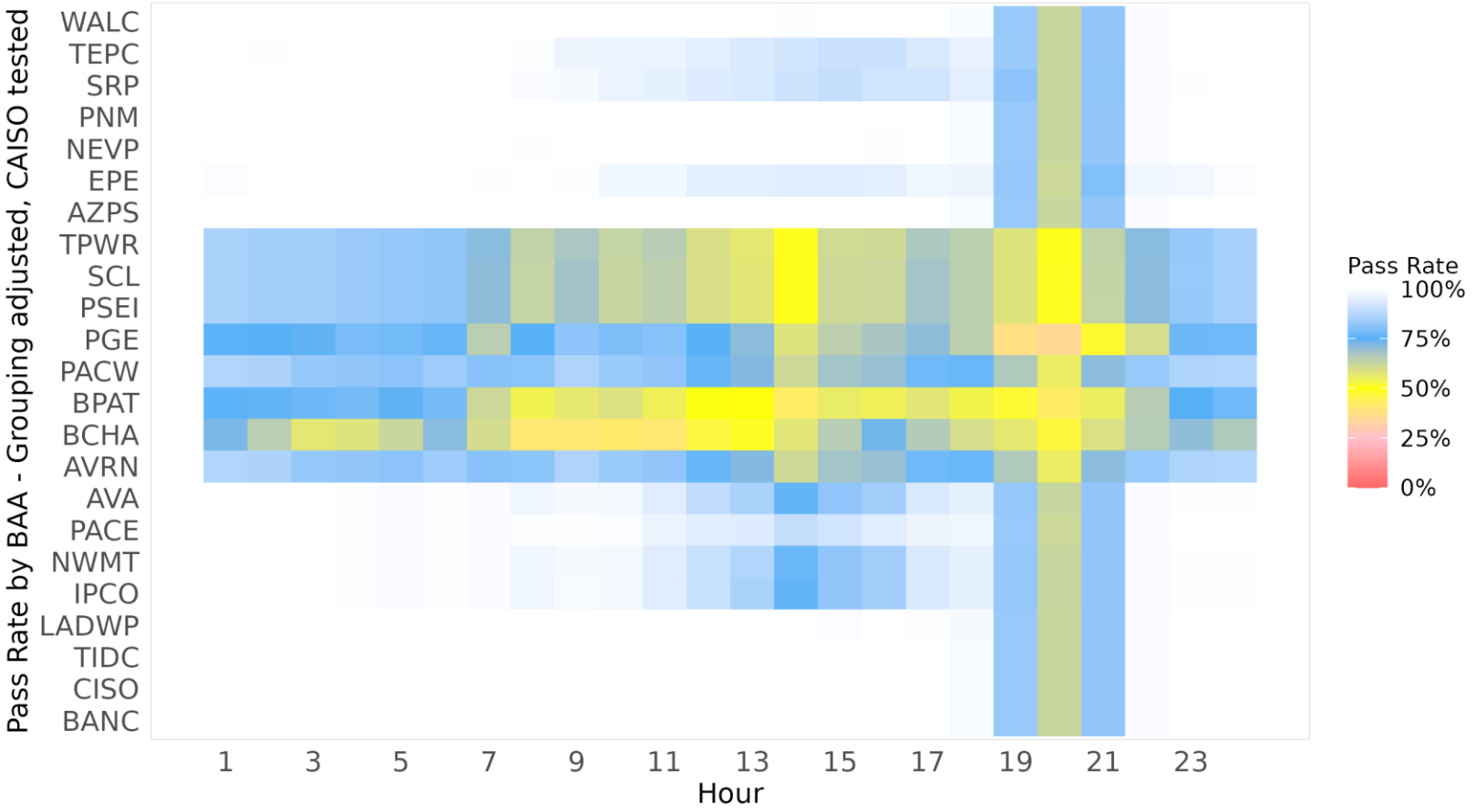
Under the adjusted grouping approach, adding LSO component further increased the overall passing rates.



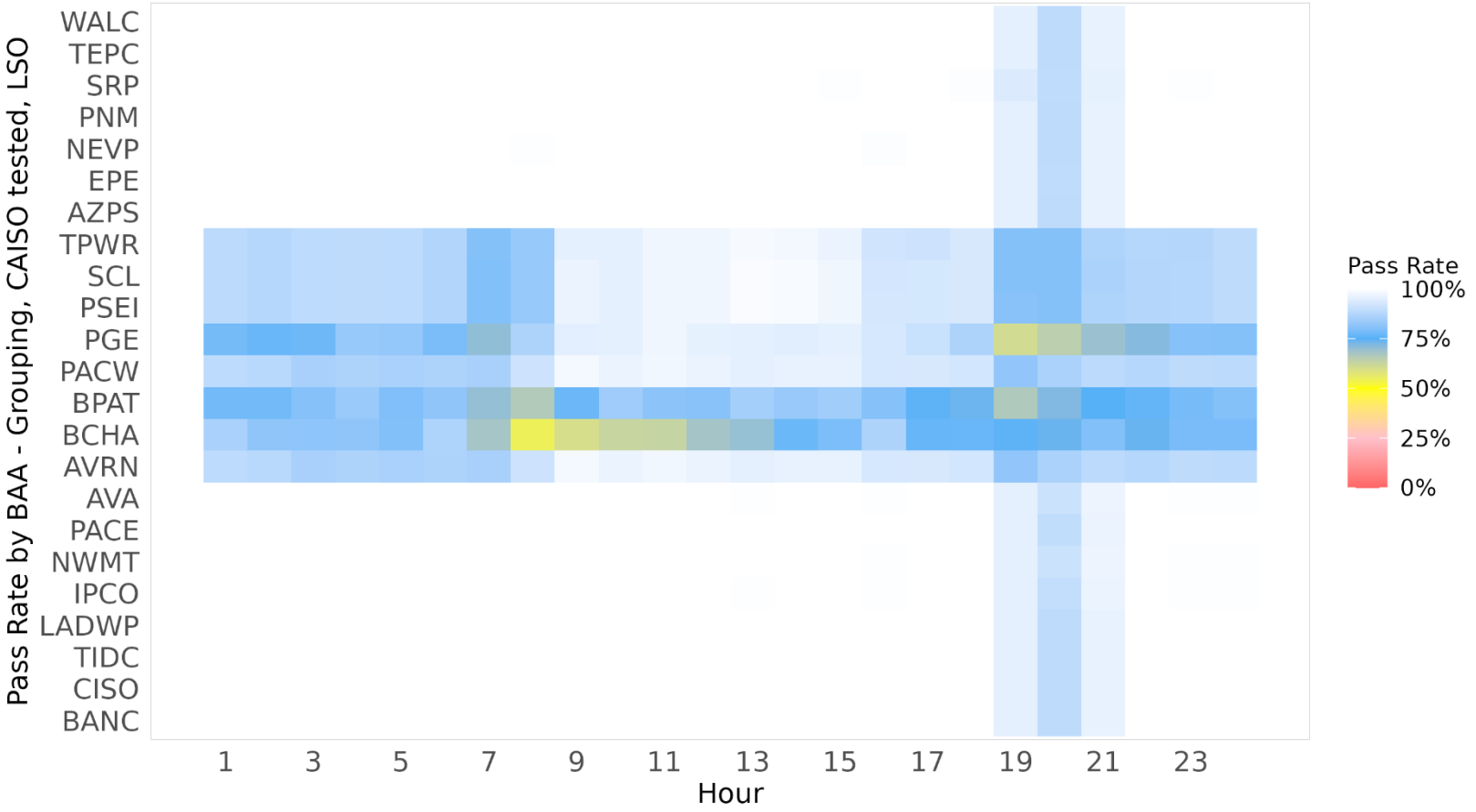
Under grouping approach with CAISO tested, pass rates dropped for all BAAs in hours ending 19 through 21



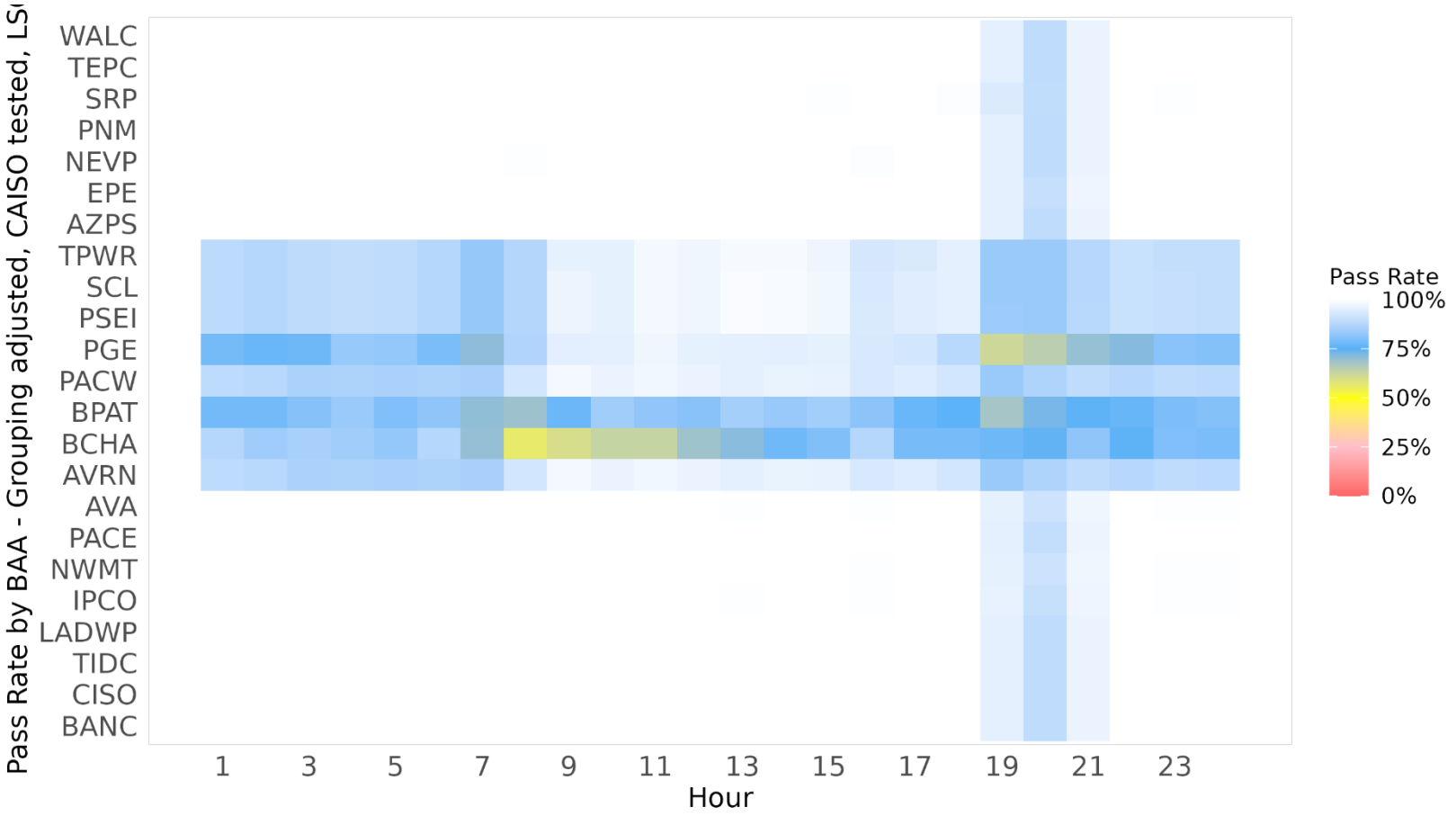
Under the adjusted grouping approach with CAISO tested, pass rates largely remained the same as the previous variation.



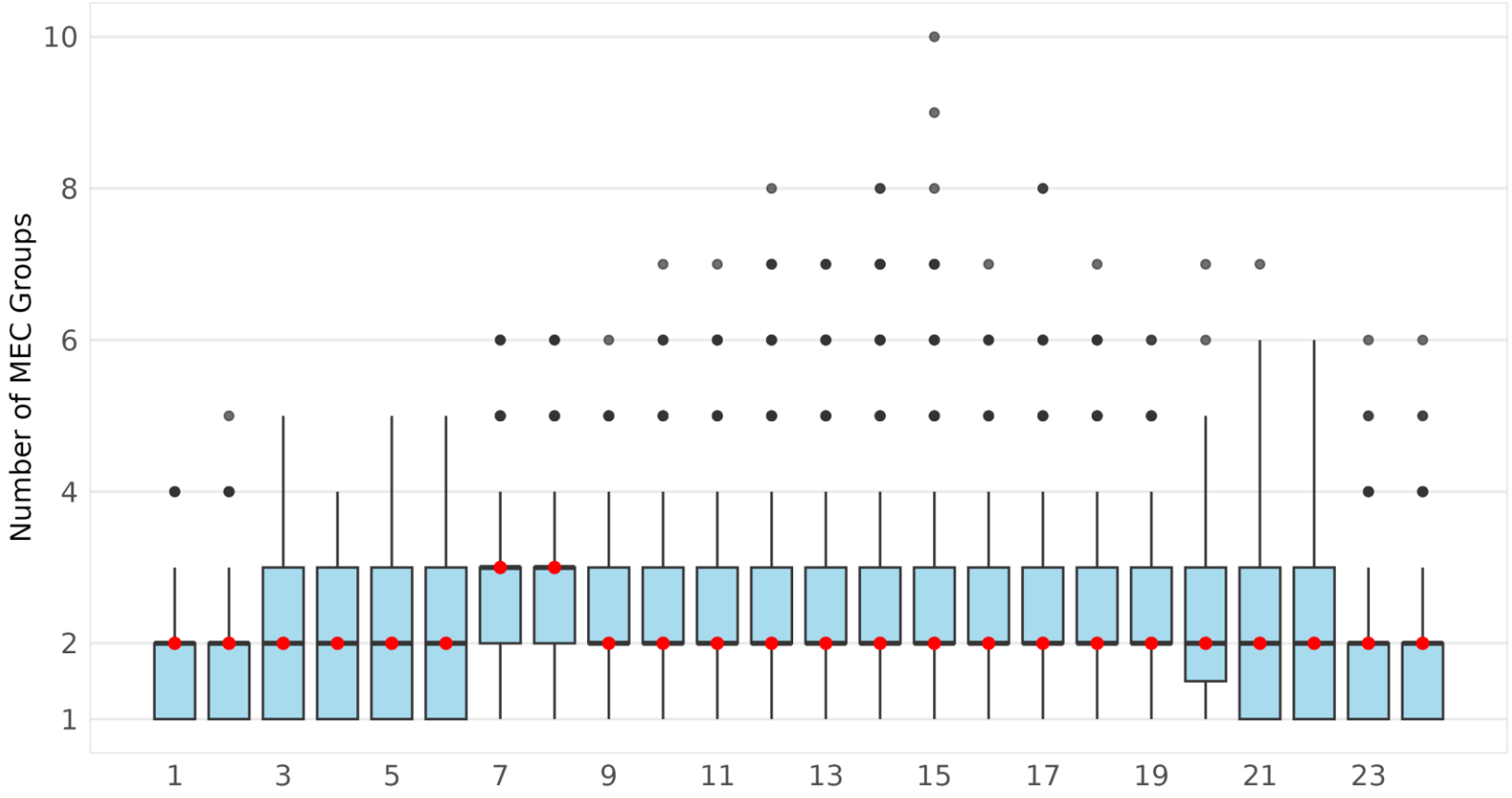
Under the grouping approach with CAISO tested and adding LSO component, pass rates increased for early morning through mid afternoon hours, and decreased for Southwest and California BAAs in hours ending 19 through 21.



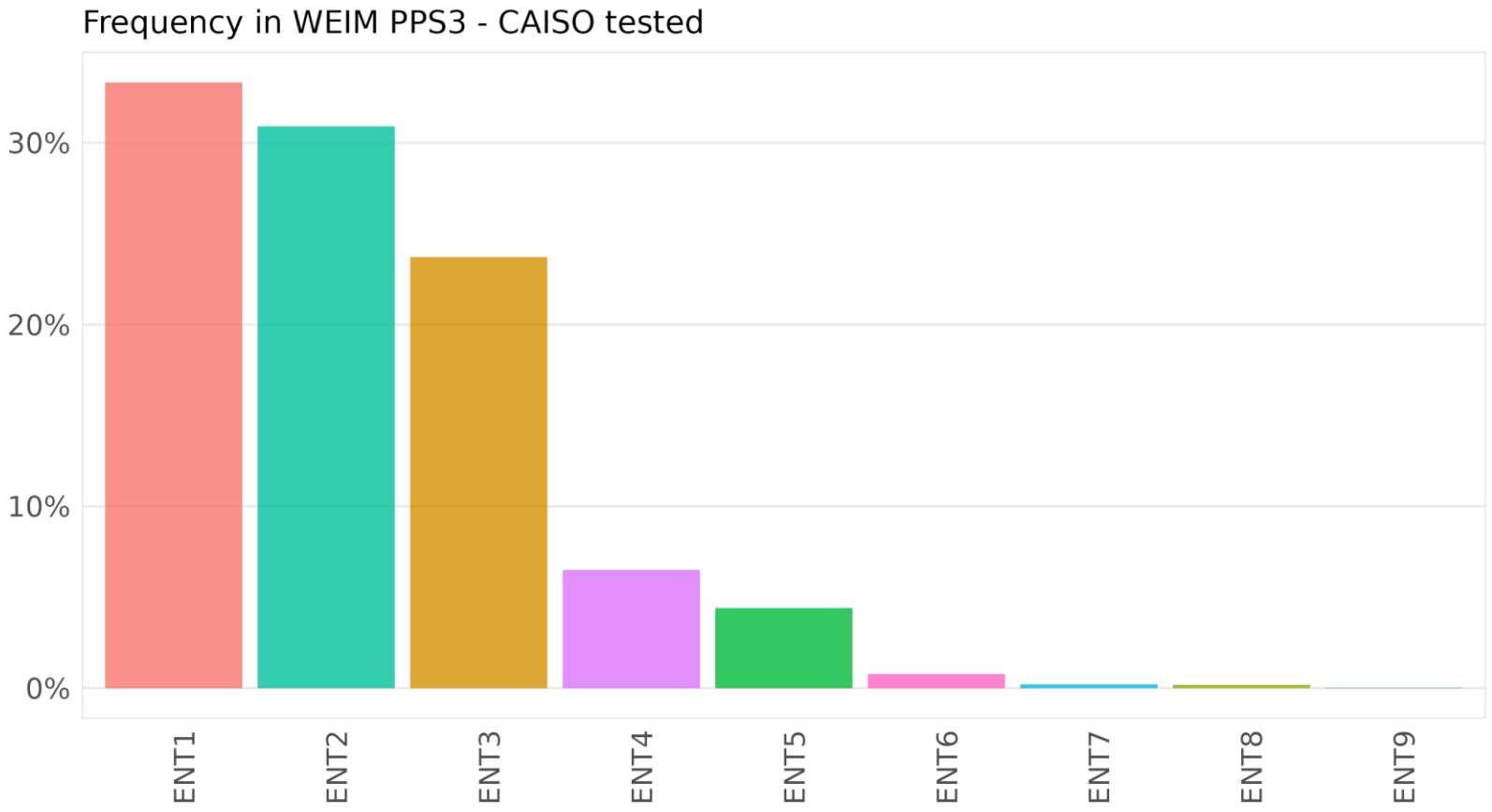
Under the adjusted grouping approach with CAISO tested and adding LSO component, pass rates had marginal increase from the previous variation.



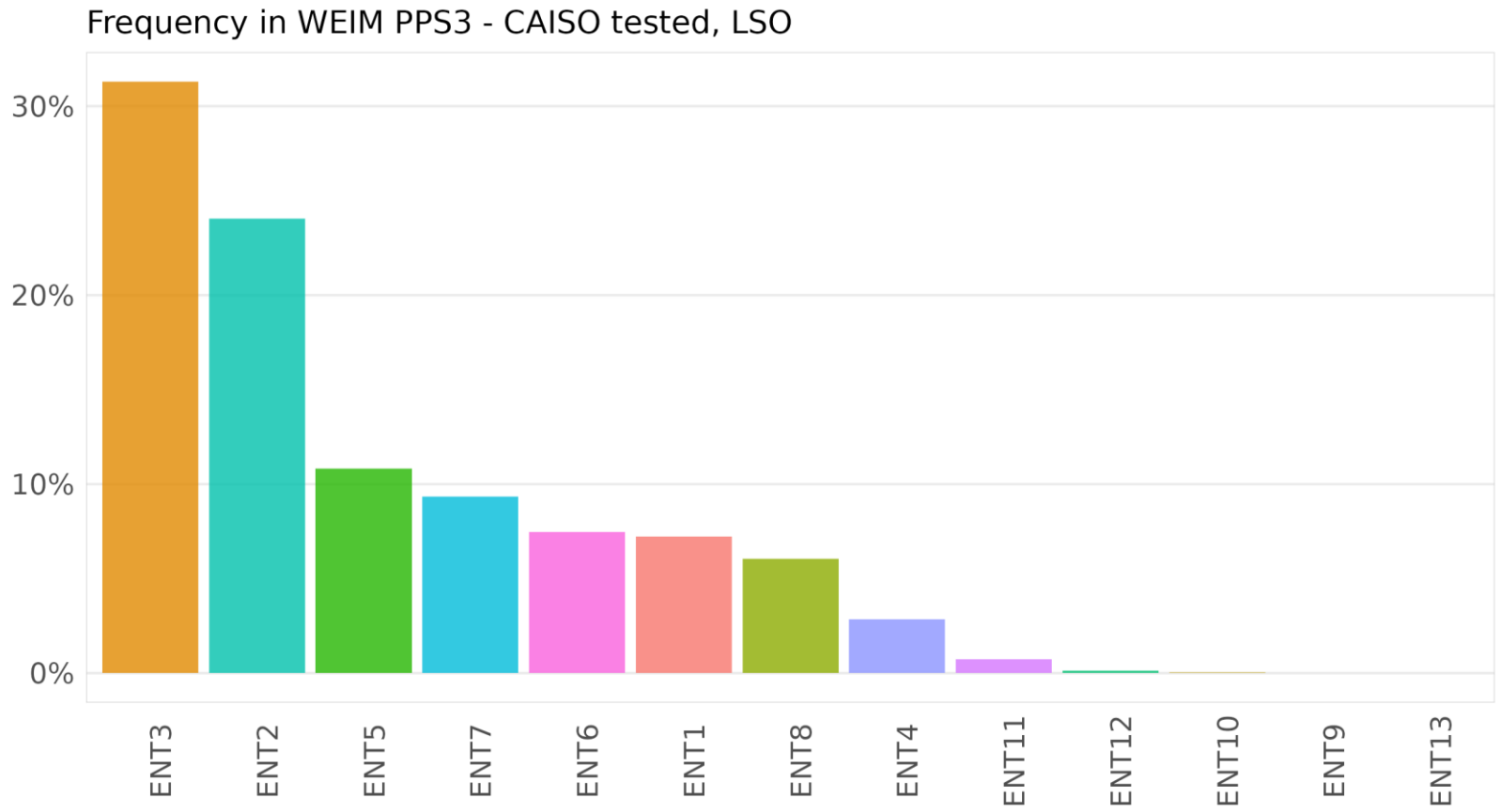
Majority of the time, all BAA MECs fall into 1 to 3 groups in 2025 summer months.



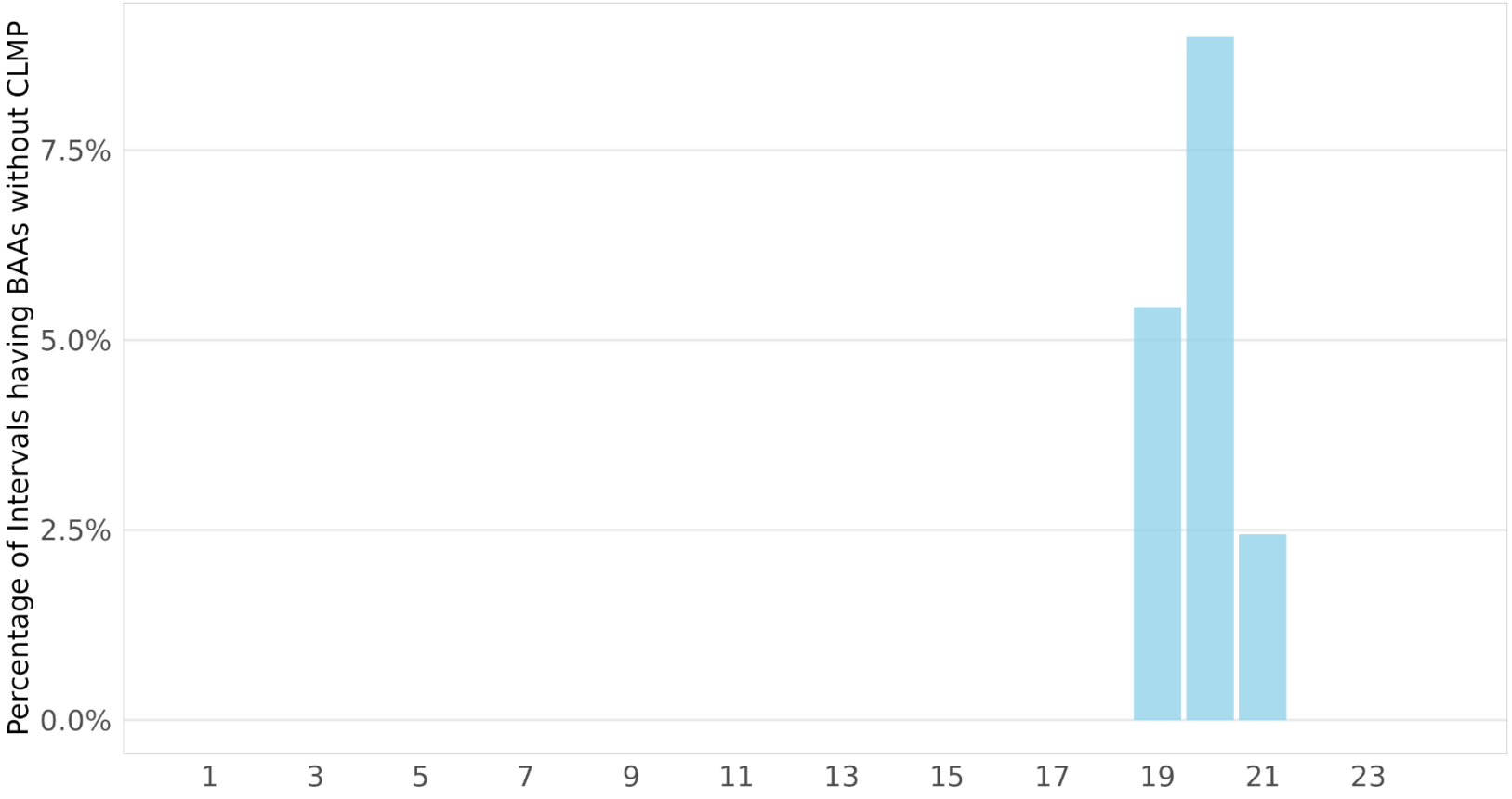
Grouping with CAISO tested: frequency of affiliations appearing in WEIM PPS3 concentrated in top three.



Grouping with CAISO tested adding LSO: frequency list expands and ranking of entities is reordered.



Under adjusted grouping with CAISO tested and adding LSO, percentage intervals having any BAA without CLMP is up to 8.99% in hour ending 20.



Under adjusted grouping with CAISO tested and adding LSO, price buckets for MEC to competitive LMP deltas for Failed tests primarily fall between $0-$20.