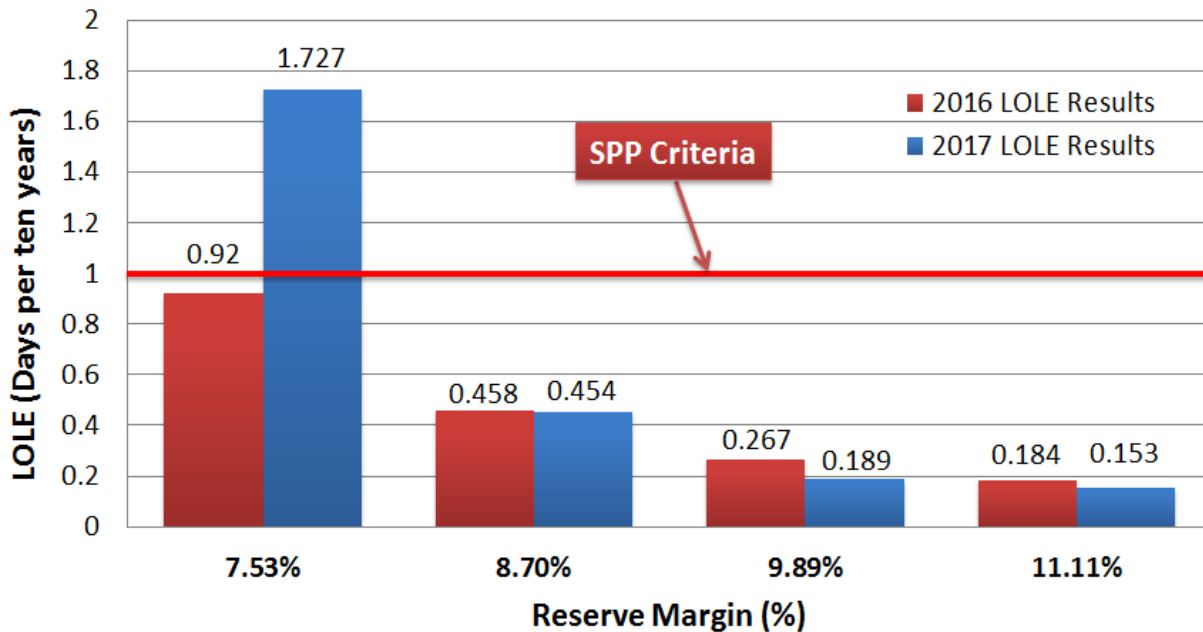




# Comments on SPP 2015 Reserve Margin LOLE Report

## SPP Studied Reserve Margin LOLE results for 2016 and 2017:

### Reserve Margin Loss of Load Expectation Study Results



SPP Criteria section 2.1.9:  
 “Each Load Serving Member’s Minimum Required Capacity Margin shall be twelve percent. If a Load Serving Member’s System Capacity for a Capacity Year is comprised of at least seventy-five percent hydro-based generation, then such Load Serving Member’s Minimum Required Capacity Margin for that Capacity Year shall be nine percent”.

- SPP’s lower reserve margin to meet the 1 in 10 LOLE criterion (compared to PJM’s) appears to be driven by the following two factors:
  - Load Forecast Uncertainty

Area Name	Pattern	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Area 1	P1	1	1	1	1	1	1	1	1	1	1	1	1
Area 1	P2	1.0112	1.0123	1.0137	1.0134	1.0132	1.0066	1.0060	1.0060	1.0121	1.0134	1.0140	1.0126
Area 1	P3	1.0154	1.0173	1.0228	1.0228	1.0222	1.0123	1.0112	1.0112	1.0206	1.0225	1.0236	1.0178
Area 1	P4	1.0203	1.0225	1.0288	1.0288	1.0283	1.0217	1.0211	1.0208	1.0269	1.0285	1.0299	1.0233
Area 1	P5	1.0225	1.0250	1.0340	1.0343	1.0335	1.0261	1.0252	1.0252	1.0321	1.0337	1.0354	1.0261
Area 1	P6	1.0230	1.0255	1.0376	1.0381	1.0376	1.0285	1.0274	1.0274	1.0357	1.0379	1.0395	1.0269
Area 1	P7	1.0230	1.0255	1.0376	1.0381	1.0376	1.0285	1.0274	1.0274	1.0357	1.0379	1.0395	1.0269

Figure 6: A load probability matrix example for one area

Load Multiplier Pattern	Percentage Chance of selection for simulation
P1	50%
P2	19.15%
P3	14.99%
P4	9.18%
P5	4.41%
P6	1.65%
P7	0.62%

Figure 7: The occurrence probability for each multiplier

The highest multiplier in the summer season is 1.0285 (M6) with total probability 0.0227 (0.0062+0.0165)

- If we look at PJM's CP1 distribution, a 1.0285 per-unitized load corresponds to a 60/40 load, meaning that there is a 40% chance of having a peak that exceeds 1.0285 times the forecasted summer peak.
- In the case of SPP, that same probability is much less (around 2%-3%)
- Furthermore, in the last 16 years, PJM has exceeded its 50/50 weather-normalized forecasted load by more than 3% on 10 days (3 days in 2001, 2 days in 2006, 2 days in 2011, 3 days in 2013)

- We can conclude that either SPP has significantly less uncertainty around the peak load or that the uncertainty considered in their IRM Study is understated.
- If we use a similar LFU in the computation of the PJM IRM, we estimate that the IRM decreases by about 6 percentage points.
  - Current PJM IRM = 16.5%
  - Estimated PJM IRM with SPP LFU = 10.5%

- The second factor that drives the low SPP Reserve Margin is that they apply the IRM to their non-coincident peak

Studied Reserve Margin (%)	Adjusted Reserve Margin (%)	Total Committed Capacity (MW)	Adjusted Committed Capacity (MW)	Studied Non-Coincident Peak Demand <sup>18</sup> (MW)
7.53	7.82	70,465	70,655	65,530
8.70	9.00	70,465	70,655	64,825
9.89	10.19	70,465	70,655	64,123
11.11	11.41	70,465	70,655	63,419

Table 7: The 2016 SPP adjusted peak demand values associated with the studied reserve margins

Studied Reserve Margin (%)	Adjusted Reserve Margin (%)	Total Committed Capacity (MW)	Adjusted Committed Capacity (MW)	Studied Non-Coincident Peak Demand <sup>17</sup> (MW)
7.53	7.91	70,808	71,036	65,850
8.70	9.09	70,808	71,036	65,141
9.89	10.29	70,808	71,036	64,435
11.11	11.51	70,808	71,036	63,728

Table 8: The 2017 SPP adjusted peak demand values associated with the studied reserve margins

- PJM's IRM is applied to the coincident peak
  - For instance, the 16.5% IRM for 2019 is applied to the 2019 Coincident Peak (from the 2016 PJM Load Forecast)
    - $1.165 \times 156,958 \text{ MW} = 182,856.07 \text{ MW}$
  - The 2019 PJM non-coincident peak (from the 2016 PJM Load Forecast) is 160,579
    - Thus, the PJM 2019 IRM on a non-coincident peak basis is,
    - $182,856.07 / 160,579 = 13.9 \%$
  - Thus, if PJM applies the IRM to its non-coincident peak, the IRM is 2.6% lower ( $16.5\% - 13.9\% = 2.6\%$ )

- In summary, if we would use an LFU similar to that used by SPP and if we would express the IRM in terms of the PJM non-coincident peak, the PJM IRM can be estimated to be around 7.9% ( $16.5\% - 6\% - 2.6\% = 7.9\%$ )