Follow up items from February RAAS

- Question: Examine how much the IRM is affected by varying the FEF

  Response: This is a regular sensitivity in the RRS.

  From the 2015 RRS, Sensitivity #8: "This two-area sensitivity gauges the impact of the FEF on the IRM. When the FEF is decreased to 0% compared to the 1% used in the base case, the IRM falls by 0.16pp. When instead the FEF is increased to 2.5%, the IRM increases by 0.80pp."

- Question: Examine whether there is a way to determine an EEFORd associated with high risk days, and if so, calculate it.

  Response:

  The following table was developed by using GADS data from the period 03/01/2008 – 03/01/2016 (8 years or 70128 hours)

Hours Description	EFOF	EMOF	EPOF	EUAF	EAF	Hours
Summer (Actual Load > WN Summer Peak)	7.10%	0.60%	0.50%	8.20%	91.80%	68
Winter (Actual Load > WN Winter Peak)	11.50%	0.60%	2.20%	14.30%	85.70%	143
All Other Hours	5.40%	3.10%	7.80%	16.30%	83.70%	69917
All Hours	5.40%	3.10%	7.70%	16.20%	83.80%	70128

  where

  EFOF: Equivalent Forced Outage Factor

  EMOF: Equivalent Maintenance Outage Factor

  EPOF: Equivalent Planned Outage Factor

  EUAF: Equivalent Unavailability Factor

  EAF: Equivalent Availability Factor

  Note that the factors above were not computed when units were necessarily on-demand. However, it is highly likely that the units were on-demand during the Summer and Winter hours where the actual load was greater than the weather normalized (WN) peak. In those hours, the EFOF in the table above provides a rough estimate of the EFORd while the EUAF provides a rough estimate of the EEFORd. The current 5-year average EFORd is 6.60% while the current 5-year average EEFORd is 7.30%. In the high-load Summer hours, the performance of units seems to be slightly worse than what is captured by the current 5-year average EFORd and EEFORd (EUAF = 8.20% vs EEFORd = 7.30%); during the high-load Winter hours, the performance of units seems to be much worse (EUAF = 16.30% vs EEFORd = 7.30%).

If we were to use these higher outage rates in Summer and Winter to compute the IRM and FPR, the IRM and FPR would be impacted as follows,

- The higher unavailability shown in the high-load Summer hours increases the IRM but does not change the FPR.
- The higher unavailability during high-load Winter hours has a negligible effect on the LOLE since forecasted Winter peaks are significantly lower than forecasted Summer peaks (and therefore, the forecasted Winter reserves are significantly larger).

- Question: Look into units where deration exceeds EEFORd (analysis presented only talked about average)

Response: If we remove the data of those units for which their estimated ambient derate (according to Summer Verification Test data) is larger than their 5 yr Average EFORd, the estimated Total Deration in the 2015 RRS decreases to 1742.3 MW (from 2645.9 MW).

Original,

Unit Type	1° F Deration (% of ICAP)	Delta Temperature (°F)	Total Deration (% of ICAP)	Total ICAP in 2015 RRS (MW)	Total Deration in 2015 RRS (MW)
CC	0.39	8.8	3.432	32670	1121.2
CT	0.53	8.8	4.664	26560	1238.8
DS	0.04	8.8	0.352	630	2.2
NU	0.01	8.8	0.088	34240	30.1
ST	0.04	8.8	0.352	72020	253.5
				TOTAL	**2645.9**

After removing data,

Unit Type	1° F Deration (% of ICAP)	Delta Temperature (°F)	Total Deration (% of ICAP)	Total ICAP in 2015 RRS (MW)	Total Deration in 2015 RRS (MW)
CC	0.21	8.8	1.848	32670	603.7
CT	0.42	8.8	3.696	26560	981.7
DS	0.00	8.8	0	630	0.0
NU	0.01	8.8	0.088	34240	30.1
ST	0.02	8.8	0.176	72020	126.8
				TOTAL	**1742.3**

However, as shown in the next response, there is no evidence of generators modifying their MW offer in RPM to reflect these larger ambient derations.

- Question: Investigate whether amounts of UCAP for same unit are changing (going down) in response to CP rules

Response: Comparing the 2017 BRA generation offer data with the 2018 BRA generation offer data shows,

- Out of 1200-1300 units, only 56 exhibit a modification in Eligible MW Offer that can potentially be attributed to CP rules (36 show a decrease while 20 show an increase)
- The net impact of the above Eligible MW Offer modifications is +114.1 MW (-190.5 MW in total decreases; 304.6 MW in total increases)

- Question: Scale the ambient derate that was calculated way back when for MAAC to the RTO.

  Response: Back in 2007, the ambient derate estimate of 2,500 MW was calculated based on the MAAC generation fleet which amounted to 52,500 MW. Scaling the result from 2007 (by unit type) to the RTO footprint considered in the 2015 RRS yields an estimate of around 7,600 MW worth of ambient derates.