



Real Time Operations: Synchronized Reserves

- Synchronized Reserves must be:
 - Accurately calculated (unit level and in aggregate):
 - Emergency/Shortage vs Normal Operations
 - Dependable:
 - Respond when called to ensure DCS compliance and ACE recovery
 - Deliverable:
 - Not bottled by wide area IROs or other system constraints

- Tier 2 calculated and assigned based on Gen Owner submitted parameters:
 - Tier 2 reserve for online units = (ramp rate X 10), capped at spin/eco max
- Tier 1 estimate is **not** based solely on Gen Owner submitted unit parameters:
 - Ramp rates clamped down (DGP)
 - Resource classes removed (hydro, energy storage, CC units without spin max < eco max)
 - Historic consistent poor performers made ineligible
 - Current OC 2018 work efforts
 - Lesser of spin vs eco max in SCED
 - Removal of spin ramp rates

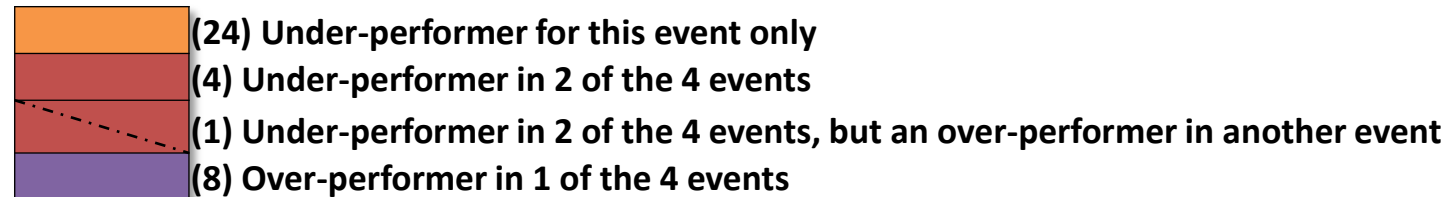
- As reported at the OC March 6th
 - 2017 Tier 1 response rate: 66%
 - 2017 Tier 2 response rate: 98%

- 2018 Tier 1 performance year to date:

Date	Start Time	End Time	Duration	Region	Tier 1 Estimate (MW)	Tier 1 Response (MW)	Response Rate
1/1/2018	2:41	2:48	0:07	RTO	1135	668	58.8%
1/3/2018	3:00	3:13	0:13	RTO	1896	509	26.8%
1/7/2018	14:15	14:24	0:09	RTO	2513	850	33.8%
4/12/2018	13:28	13:38	0:10	RTO	1063	591	55.6%

- Analysis of the Top 10 worst Tier 1 performers per event this year:

Synch Reserve Event	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
1/1/2018	Unit A	Unit B	Unit C	Unit D	Unit E	Unit F	Unit G	Unit H	Unit I	Unit J
1/3/2018	Unit I	Unit K	Unit L	Unit M	Unit N	unit O	Unit P	Unit Q	unit R	Unit S
1/7/2018	Unit T	Unit U	Unit V	Unit W	Unit X	Unit H	Unit Y	Unit Z	Unit AA	Unit BB
4/18/2018	Unit CC	Unit DD	Unit E	Unit EE	Unit FF	Unit GG	Unit HH	Unit D	Unit II	Unit JJ



- Tier 1 Unit specific over or under performance is not consistent from event to event
- No obligation to respond = no consistency in response

- Dynamic Interface:
 - Ensures IROs will not be violated when assigning reserves.
- Lack of ability to consider non-IROs (actual overloads, severe contingency overloads, etc.)

