

Stakeholder Feedback to MGSTF Design Component Prioritization

GT Power Group (Dave Pratzon & Tom Hyzinski)

Identify unit dispatch breakpoints

One of the places where the new unit model effort intersects with other PJM initiatives is in the proposal at the EPFSTF to redesign the synchronized reserve market processes. PJM has observed for some time that their calculation of available Tier 1 reserves is substantially in excess of observed response during many synchronized reserve activation events. One reason for this persistent difference could be limitations in GO ability to model unit operational features within their segmented dispatch curves, such as 1 BFP/2 BFP limits, coal mill switch points or augmented operating modes on CC plants.

To the extent that PJM-GO evaluations show that modeling limitations contribute significantly to the observed difference in calculated versus delivered Tier 1 response, it would be worthwhile for the MGSTF to consider whether minor, straightforward data items could be added to the current model to identify unit dispatch breakpoints and improve PJM's estimate of available Tier 1 resources on a real time basis.

Additional input from Tom Hyzinski

- Better model discontinuities in the offer curves
- Collapsing Tier 1 & Tier 2 amount of reserves to be calculated similar to current Tier 1 calculations today
- Important to include this item going forward
- Tier 1 problem replaced with must offer requirement
- Additional comments will be provided by Tom prior to the February 2019 meeting

Additional input from Scarp

- More accurate reserve calculations are needed

Dominion

Related to Design component #4 DA Modeling of Fuel Switching cost

Problem: Fuel switching (for dual fuel units) while possible with hourly offers, doesn't allow for all parameters to be changed. While you can change your actual offer curves, you can also change the startups, no load, min runtime, and notification time. **However, you cannot change your max runtime or actual fuel type for the 99 price-based curve.** Therefore, if you are awarded on your 99 curve, there is no way to change fuel type without switching to cost.

In our example of 99 price-based curve on oil with max run of 4 hours. There is no way to change specific hours to gas; the max run time cannot be switched to 16 hours. Even though the price reflects gas the scheduled detailed page would still reflect oil (with max run time of 4 hours).

Below represents the parameters you are allowed to change in the current platform

Offers							
Offer Updates		Detail		Detail Updates		Manager	
Selection		Availability Update		Restriction Information		TPS Schedule Switch	
<input type="checkbox"/> Switch To Cost Schedule		Start Hour		16		Last Updated Date/Time: 2018-07-27 12:24:06	
Hour	No Load Cost	Cold Startup Cost	Intermediate Startup Cost	Hot Startup Cost	Minimum Runtime	Notification Time	Status
1						3	Not Committed
2						3	Not Committed
3						3	Not Committed
4						3	Not Committed
5						3	Not Committed
6						3	Not Committed
7						3	Not Committed
8						0.5	Not Committed
9						0.5	Not Committed
10						0.5	Not Committed
11						0.5	Not Committed
12						0.5	Not Committed
13						0.5	Not Committed
14						0.5	Not Committed
15						0.5	Not Committed
<input type="checkbox"/> 16						0.5	Not Committed
<input type="checkbox"/> 17						0.5	Not Committed
<input type="checkbox"/> 18						0.5	Not Committed
<input type="checkbox"/> 19						0.5	Not Committed
<input type="checkbox"/> 20						0.5	Not Committed
<input type="checkbox"/> 21						0.5	Not Committed
<input type="checkbox"/> 22						0.5	Not Committed

Suggested change; be able to model fuel types per hour.

You can currently change your price offer to “reflect” two fuel types, but the details of the 99 curve will only be one fuel type. Therefore if you specify “Oil” as your fuel type, it has a max run time of 4 hours. But in real-time, you find out you can run 10 hours of gas. You change the offers down to reflect that gas, but PJM is limited to running the unit for 4 hours because you couldn't change the max run time.

Related to Design component #19 Modeling Fuel Market and Supply limitations

Problem: Combined cycle units are very dependent on ambient temperature and relative humidity. Therefore, the “base load” (full load without duct burners) value can vary greatly throughout the day. The current system only allows 1 ramp rate to be entered for the entire day by 10:30 the previous day. The ramp rate that takes it to “base load” could be off during most hours of the day due to temperature and humidity swings.

Suggested change: Allow units to be able to change ramp rates hourly.

Example of ramp rate for one day for a combine cycle unit with ducts:

MW	Up Ramp Rate	Down Ramp Rate
170.0	1.0	
250.0	7.5	
290.0	1.5	
488.0	10.0	
999.0	2.0	

488-999 ramp rate is locked down at 2.0

Example of how much the ECO MAX changes in one day for a combined cycle unit:

In this example 488 MWs is “base load” (full load without duct burners) but there is no category in PJM’s hourly updates for this value, which is why you rely on the ramp rate to slow down once you hit duct burners. Therefore, if your ramp rate shows a “base load” at 488 MWs for the entire day, it will only be accurate for a few hours. Duct burner ~ 72 MWs (560 ECO MAX - 72 = 488 MWs base load)

Hourly Updates	Detail	Energy Ramp Rates	Synchronized Reserve Ramp Rates	Wind Forecast	Solar Forecast	IntraDay Opt Out
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<input type="checkbox"/>	Hour ^
	3
	4
	5
	6
	7
	8
	9
	10
	11
	12
	13
<input type="checkbox"/>	14
<input type="checkbox"/>	15
<input type="checkbox"/>	16
<input type="checkbox"/>	17
<input type="checkbox"/>	18
<input type="checkbox"/>	19
<input type="checkbox"/>	20
<input type="checkbox"/>	21
<input type="checkbox"/>	22
<input type="checkbox"/>	23
<input type="checkbox"/>	24

Econ. Max. (MW)
568.0
570.0
570.0
570.0
568.0
565.0
560.0
555.0
550.0
547.0
543.0
542.0
542.0
543.0
545.0
548.0
552.0
555.0
559.0
562.0
565.0
567.0

Old Dominion Electric Cooperative

- 1) Allow for CC to switch to cost in RT and change the schedule even after a DA award
 - a. Now – if committed and not switching fuels then you can't switch schedules
 - b. Needed for situations to switch between 1X1 and 2X1

- 2) Provide ramp rate curves on an hourly differentiated basis and change ramp rate curves in RT on an hourly basis
 - a. Now a daily ramp rate
 - b. Needed – ability to reflect ramp rates if configuration changes

- 3) Ability to be on dispatch but out of UDS during start-up and configuration changes
 - a. Now have to run-for-company to have basepoint be an echo-back of the output – no way to be out of UDS but on for PJM (no DMT “reason ID” to be on for PJM and out of UDS) – getting BOR for starting and transitioning
 - b. Needed – able to be out of UDS but on for PJM