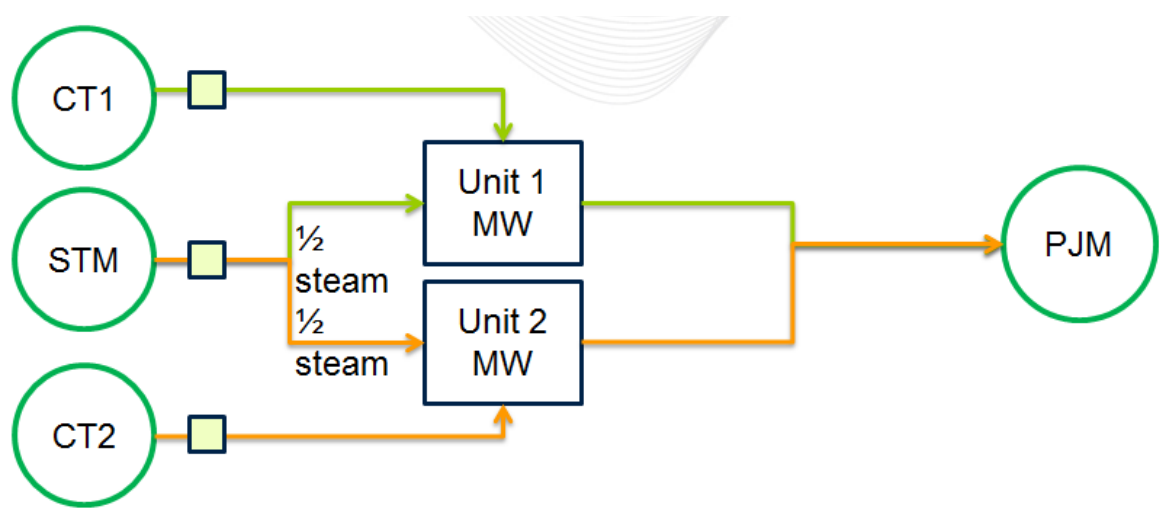




MGSTF Short Term Solution Update and Peaking Segment Proposal

Tom Hauske
Sr. Lead Engineer
Modeling Generation Senior Task Force
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- Formalize Duct Burner Commitment / Peaking Segment Day Ahead and Real Time rules and operation in manuals
- Hourly Ramp Rate Updates consistent with EPFSTF efforts
- Continue use of the existing Pseudo Model in the short term



- Goal is to encourage unit flexibility
- Peaking Segment MW offered into Day Ahead and Real Time are included in Economic Max
- No minimum commitment for peaking segment
- Units with inflexible or restrictive parameters must call PJM Dispatch for permission to enter and exit peaking segment
- Settlements remains unchanged
- The existing Pseudo Model for combined cycles is still allowed

- Proposed changes
 - Eco Max must include peaking segment output capability
 - **Allow hourly differentiated Ramp Rates**
 - **Increase Incremental Price/MW pairs from 10 to 20**

- Eco Max includes peaking segment output capability.
- Use segmented ramp rates to model resource output for entry and exit of peaking segments **and configurations**.
- No requirement to model min load, base load, and peak segment as separate offer points.
- PJM's Enhanced Price Formation in Reserve Markets filings includes the ability to change ramp rates hourly **after reliability run**.

- Starting and stopping a Duct Burner peaking segment

MW	Segments	Up Ramp	Down Ramp	
150	250	10 MW/Min		Eco Min to Base Load
250	252	0.1 MW/Min		20 min start hold
252	300	5 MW/Min		Duct Burner Range up
300	252		5 MW/Min	Duct Burner Range down
252	250		0.1 MW/Min	20 min shutdown hold
250	150		10 MW/Min	Base Load to Eco Min

- Changes in peaking segment entry points due to ambient temperature changes can be modeled using a combination of incremental price/MW pairs, segmented ramp rates and intraday updates.
 - Down ramp rate can not be less than up ramp rate
 - Note price schedules can only be decreased during commitment

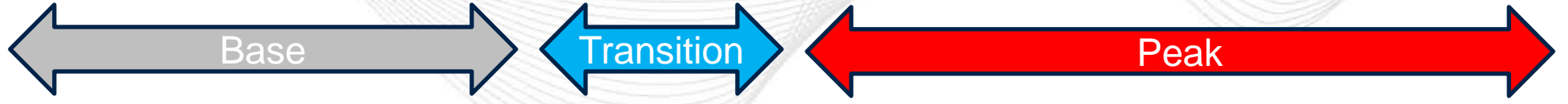
Example Ambient Dependent Peaking Segment - Morning



Incremental	150 MW	240 MW	242 MW	250 MW	252 MW	300 MW
Price	\$25/MWh	\$27/MWh	\$27.1/MWh	\$27.2/MWh	\$40/MWh	\$40.1/MWh
Up Ramp	10 MW/min	10 MW/min	10 MW/min	10 MW/min	0.1 MW/min	5 MW/min
Down Ramp	10 MW/min	10 MW/min	10 MW/min	10 MW/min	1.0* MW/min	5 MW/min



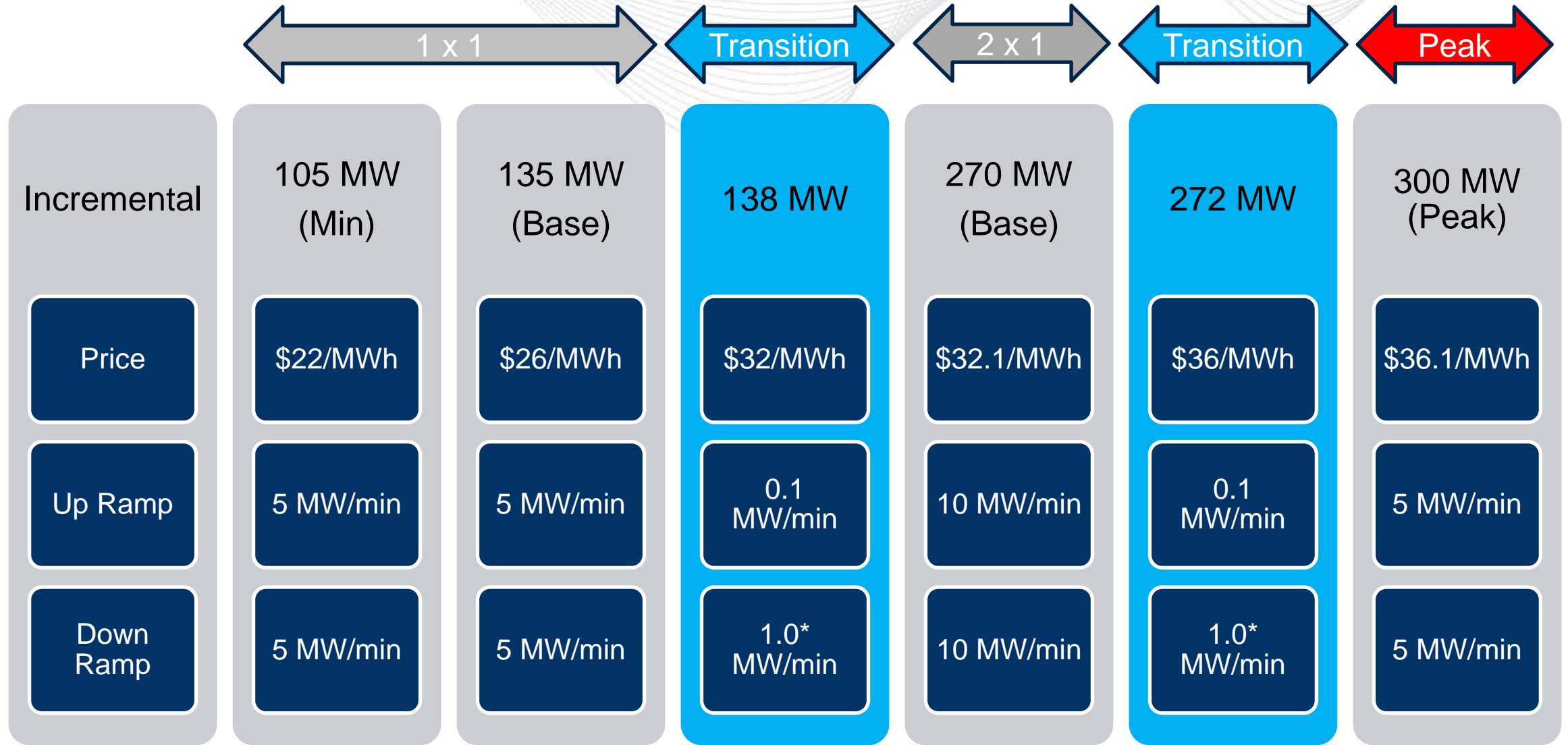
Example Ambient Dependent Peaking Segment - Afternoon



Incremental	150 MW	240 MW	242 MW	250 MW	252 MW	300 MW
Price	\$25/MWh	\$27/MWh	\$40/MWh	\$40.1/MWh	\$40.2/MWh	\$40.3/MWh
Up Ramp	10 MW/min	10 MW/min	0.1 MW/min	5 MW/min	5 MW/min	5 MW/min
Down Ramp	10 MW/min	10 MW/min	1.0* MW/min	10 MW/min	5 MW/min	5 MW/min

- Combined cycle configurations changes can also be modeled using a combination of incremental price/MW pairs and segmented ramp rates.
 - Down ramp rate can not be less than up ramp rate

Example Modeling Configurations



- No minimum commitment period for peaking segment
 - PJM looked at both manual and SCED commitment options. Neither was considered viable.
- Market Sellers with a flexible peaking segment can follow basepoints into and out of the peaking segment without contacting PJM Dispatch
- Market Sellers with inflexible peaking segment shall request PJM Dispatch permission to enter their peaking segment when following or outside of their SCED economic basepoint
 - If needed for reliability PJM Dispatch will allow the unit to enter the peaking segment
 - Otherwise, PJM Dispatch will log units as running for Company

- Existing rules remain unchanged for:
 - Make Whole
 - Lost Opportunity Cost
 - Deviations