



# Operating Reserve Clarification Matrix Component Updates

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January 12, 2024

## Status Quo

Resources with a soak process are not eligible prior to start of commitment. All intervals from synchronization to the start of the commitment, which are used for initial ramping and soaking to meet the commitment, are excluded from both make whole segments.

*Resources without a soak process are eligible for ramping intervals prior to the start of the commitment (limited to 30 minutes).*

## Issue with Status Quo:

For resources without a soak process, resources could be made whole to an offer that was not part of PJM's commitment decision and/or made whole to the cost of a fuel they are not running on for their commitment. This happens when the unit is committed for an hour in which the prior hour's offer is significantly higher or based on a different fuel.

## Examples:

- A. Resource is offered at \$200/MWh for hours 00:00 – 09:00 and at \$50/MWh for hours 10:00 – 23:00. The resource is called on to start at hour 10:00 and it actually starts at 09:40. Under status quo, the unit is eligible to be made whole for the \$200/MWh offer from 9:40 – 10:00.
- B. Resource is offered on oil for hours 00:00 – 09:00 and gas for hours 10:00 – 23:00. The resource is called on to start at hour 10 and it actually starts at 09:40, on gas. Under status quo, the unit is eligible to be made whole for the oil offer from 9:40 – 10:00.

Solution Option A	Solution Option B
<p>Status Quo plus resource <u>without</u> a soak process are eligible only if incremental energy offer price mw pairs remain less than or equal to the first hour of PJM commitment. (limited to 30 minutes)</p>	<p>Resources <u>without</u> a soak process are not eligible prior to DA or RT commitment</p>
<p><i>In the prior example, resource will only be made whole for the intervals from 9:40 – 10:00 if the offer for the 9:00 hour is less than or equal to the offer for the 10:00 hour</i></p>	<p><i>In the prior example, the resource will not be made whole for any intervals prior to 10:00, regardless of the level of the offer in those intervals.</i></p>



# Eligibility During Ramp Down – Component 1c

Status Quo	Solution Option A
<p>Eligible from the time PJM releases the unit to breaker open, or 3 hours, whichever is less. However, if unit is taken over to run for company, eligibility terminates when the unit is released from PJM dispatch.</p>	<p>Remove universal 3 hour limit and replace with resource type-specific limit</p> <ul style="list-style-type: none"><li>-Coal Resources/Solid Fuel NUG/OIL/GAS Steam Resource = 90 Minutes,</li><li>-CT Resources = 30 Minutes,</li><li>-Combined Cycle Resources = 45 Minutes</li><li>-Wind/Solar/Hydro/Battery = 0 minutes</li><li>-Nuclear = Not eligible</li></ul> <p>Resource type-specific limit were developed utilizing historical resource type data - thresholds based on 90th percentile evaluation</p>

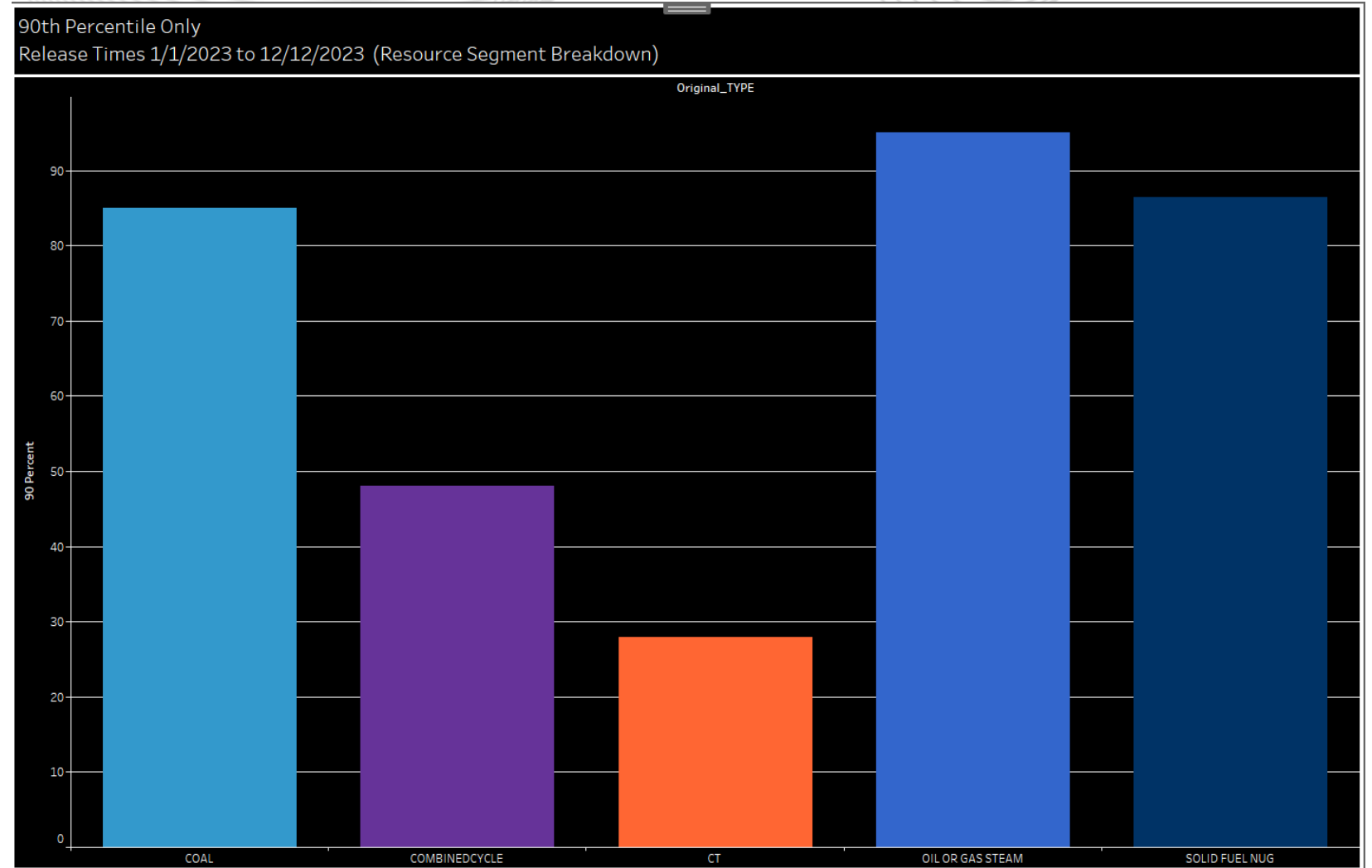
# pjm Component 1c - 90<sup>th</sup> Percentile Data from 1/1/2023 – 12/12/2023

Analysis with IMM consisted of the following:

- Approximately 11.5 months
- Large majority of resources offline within 2 hours
- Excluded outliers beyond 2 hours

## Results

- Coal Resources/Solid Fuel NUG/OIL/GAS Steam Resource = **90 Minutes**
- CT Resources = **30 Minutes**
- Combined Cycle Resources = **45 Minutes**
- Wind/Solar/Hydro/Battery = **0 minutes**
- Nuclear = **Not eligible**



Status Quo	Solution Option A
<p>No special handling at present. When the balancing MW position is positive and the LMPs are negative, it results in negative revenue (<math>+MW * -\\$LMP = -Value</math>), which increases uplift payments (<math>Cost - -Value = Increased Uplift payment</math>).</p> <p>When units over generate above their desired MW when LMPs are negative, the calculation includes negative revenue from that undirected deviation. Their uplift payment is increased as a result of not following dispatch.</p>	<p>Exclude any negative balancing revenue that results from a unit over generating when LMPs are negative. Only negative balancing revenue that is directed by PJM is included in the VALUE side of the equation.</p> <p><b>** See 'RT Only Over Gen Ex Neg LMP' tab in accompanying posted spreadsheet for an example</b></p>

- Example 1 - Generator Dispatched in RT and no Day Ahead commitment composed of three scenarios
  - Status Quo Calculation Call on by PJM (*2 scenarios*)
    - Follows PJM Dispatch instruction
    - Resource outperforms or underperforms PJM Dispatch instruction
  - Proposed Calculation/Rules utilizing ***Tracking Desired MW*** (*scenario 3*)
  - *Key Points*



- Example 1: Generator has no DA Commitment, only dispatched in RT
- Example 2: Generator has no DA Commitment, generates **above** desired in in RT during interval with Negative LMPs
- Example 3: Generator committed in DA, and generates **above** desired in RT
- Example 4: Generator committed in DA, and generates **above** desired in RT during Negative LMP interval
- Example 5: Generator has no DA Commitment, and generates **below** desired in RT
- Example 6: Generator committed in DA, and generates **below** desired in RT

## Operating Reserve Clarifications

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**Operating Reserve Clarifications**

**Potential Solution Options – Desired MW Calculations**



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