

Improve Duct-Firing Modeling: Market Design Update

Vijay Kaki

Market Design Specialist

Energy Market Design

Shubo Zhang

Market Solutions Engineer

Market Solutions Engineering

ICAPWG/MIWG

February 29, 2024

Agenda

- **Background**
- **2022 Proposed Market Design Concept**
- **RTD-CAM Market Design Elements**
- **Additional Items**
- **Next Steps**

Prior Presentations

Date	Working Group	Discussion Points and Links to Materials
02-07-2024	ICAPWG/MIWG	Improve Duct-Firing Modeling Kickoff https://www.nyiso.com/documents/20142/42807168/Improve%20Duct%20Firing%20Modeling%20DC%20Kickoff_02072024.pdf/ebc1c317-a42f-669e-1f3e-26ccd5e80b44
08-30-2023	BPWG	Market Project Descriptions: Improve Duct-Firing Modeling (Page 13) https://www.nyiso.com/documents/20142/39653286/August%2030%20BPWG%20Market%20Project%20Descriptions.pdf/7ade6560-c017-c29a-7ab9-769cd3a4c01e
03-07-2023	ICAPWG/MIWG	Improve Duct-Firing Modeling Update https://www.nyiso.com/documents/20142/36639552/Improve%20Duct%20Firing%20Modeling%20Update_MIWG_03072023_final.pdf/2f5af6b8-11b5-f1c2-e0ce-59585dfc1f00
10-27-2022	ICAPWG/MIWG	Improve Duct-Firing Modeling: Market Design Concept Proposed https://www.nyiso.com/documents/20142/34087499/Improve%20Duct%20Firing%20Modeling%20MDCP_MIWG_10272022.pdf/8e18e862-1ba0-513b-bc18-1573fb55f1dc
09-30-2022	ICAPWG/MIWG	Improve Duct-Firing Modeling Update https://www.nyiso.com/documents/20142/33520089/Improve%20Duct%20Firing%20Modeling_MIWG_09302022_final%20(002).pdf/1dd9e83a-a2f2-bac4-b8ed-f3e3d97a9461
08-24-2022	ICAPWG/MIWG	Improve Duct-Firing Modeling Update https://www.nyiso.com/documents/20142/32941988/DBimprove_MIWG_08242022_final.pdf/862020d9-faa1-ab30-9f02-e9aa8604d43f
04-05-2022	ICAPWG/MIWG	Improve Duct-Firing Modeling – Update https://www.nyiso.com/documents/20142/29688278/DBimprove_MIWG_040522_final.pdf/fe5ca5ce-d999-7609-a671-6311d06c573a
02-08-2022	ICAPWG/MIWG	Improve Duct-Firing Modeling – Kick-off https://www.nyiso.com/documents/20142/28305948/DBimprove_MIWG_020822_r2.pdf/cd34412c-cce6-5f84-230e-511b0f00e4cc

Stakeholder feedback from 2/7 MIWG

- There was a question as to whether the value for Emergency Response Rate in RTD-CAM would remain the same for CCGTs with Duct-Firing capability.
- There was a request to further explain the process of updating the ramp rates/ramp rate breakpoints.

Background

Project Background

- The Improve Duct-Firing Modeling Project is considering market enhancements to better accommodate combined-cycle gas turbine generators (“CCGTs”) equipped with duct-firing.
- 2024 project commitment is to complete the Functional Requirement Specifications (FRS).
- As per NYISO’s 2023 Market Vision Report, the project deployment is scheduled for 2025.

2022 Proposed Market Design Concept

Proposed Market Design

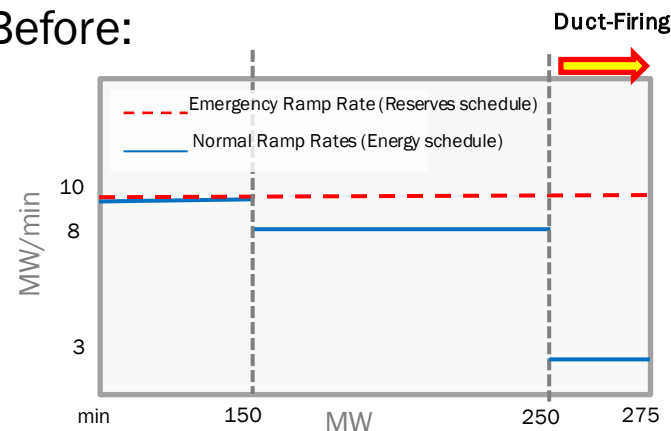
- **Use multiple ramp rates for scheduling reserves**

- Consistent with scheduling of energy today, leverage normal ramp rate “segments” (instead of the single emergency rate) to schedule reserves.
- The ramp rates utilized for operating reserve shall be the same as energy ramp rates which are registration parameters.

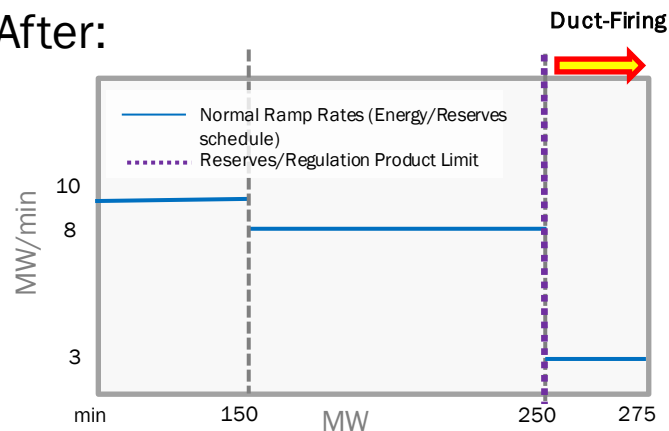
- **Allow limited participation for reserve and regulation products**

- If necessary due to limitations of the plant’s configuration, the MP may set a participation limit for reserves that is lower than the unit’s operating capacity.
- The existing ramp rate breakpoint for duct-firing range shall be used for setting the threshold limit when MP opts to limit participation in the 10-min reserve product.
- Opting to use the participation limit shall be a registration parameter and eligibility for utilizing the participation limit will be validated by MMA.
- The full range will continue to be used for energy when participation limit is employed for reserves and regulation.

Before:



After:



*example values

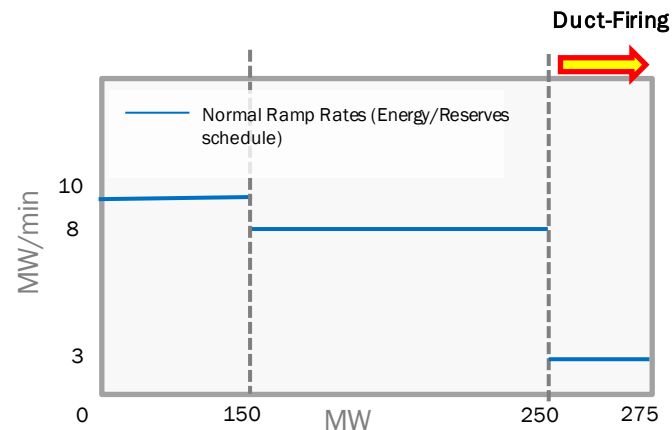
RTD-CAM Market Design Elements

Limiting Participation in RTD-CAM

- The RTD-CAM functions override the normal RTD executions, as determined by the NYISO Operators, to deal with “off-normal” power system conditions.
- In DA SCUC, RTD, and RTC, Multiple Ramp Rates and Limiting participation would be enabled while in the RTD-CAM mode, the Limiting Participation flag would be used to limit the dispatch of the units that employ the flag until the start of the duct-firing range.
- If the unit, that employs the Limiting Participation flag, is already within the duct-firing mode providing energy, then the unit will not be dispatched any higher or lower from this level.

RTD-CAM Emergency Response Rate Revision for CCGTs

- Since units that do not employ Limiting Participation can get into the duct-firing region (which utilizes a lower response rate), the unit may not be able to respond at the emergency response rate.
- For these units, the NYISO proposes to use the response rate within the response rate region that the unit is in before the RTD-CAM mode.
- For example, if the unit (which does not employ Limiting Participation) is within the 250-275MW range (duct-firing range) before the activation of the RTD-CAM mode, the response rate of 3 MW/min will be used in the RTD-CAM mode as the Emergency Response Rate.



*example values

Additional Items

Ramp Rates' Parameter Change Update

- Last year, NYISO suggested for MPs to utilize the consultation process, in response to biddable ramp rates, to change their units' ramp rates/breakpoints based on ambient conditions.
- Market Participants have the option to change unit specific ramp rate breakpoints or ramp rates based on changes to ambient conditions, or other reasons, by opening consultations with MMA through stakeholder services.
- NYISO will review these cases within the period of three business days as mentioned in the Market Participants User Guide (MPUG) for dealing with ramp rate consultation requests.

Operator's Reserve Eligibility Test

- NYISO proposes to add in the limited participation field to the reserve eligibility test so that units that have opted in for the limited participation option will not be tested beyond the start of the duct-firing range.
- NYISO will continue to utilize the emergency response rate for the reserve eligibility test.

Next Steps

Next Steps

- **March 4**
 - Consumer Impact Analysis Methodology
- **March 20**
 - Draft Tariff Revisions
- **April 2**
 - Consumer Impact Analysis Results
 - Final Tariff Review
- **May**
 - BIC/MC Vote
- **End of Q3**
 - FRS Complete
- **FERC Filing – Date TBD**

Our Mission & Vision



Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation