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Independent System Operator

Improved Duct Firing Modeling: 2024 Proposed Market Design Details

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Agenda

- Background
- 2024 Proposed Market Design Details
- Next Steps

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Prior Presentations

Date	Working Group	Discussion Points and Links to Materials
05-30-2024	ICAPWG/MIWG	Improve Duct-Firing Modeling: 2024 Proposed Project Scope https://www.nyiso.com/documents/20142/44935892/Improve%20Duct-Firing%20Modeling_MIWG_05302024_draft.pdf/cb406062-ab9f-c972-bc7f-a7709f184fd5
05-02-2024	ICAPWG/MIWG	Improve Duct-Firing Modeling: Implementation Plan and Proposed Tariff Revisions https://www.nyiso.com/documents/20142/44469922/Improve%20Duct%20Firing%20Modeling_05022024_MIWG.pdf/fdac1cd3-dba6-74e3-c97d-015925462795
02-29-2024	ICAPWG/MIWG	Improve Duct-Firing Modeling: Market Design Update https://www.nyiso.com/documents/20142/43275262/Improve%20Duct%20Firing%20Modeling_02292024_final.pdf/1512a290-02ec-afb8-92e3-9aa8bf9e9c07
02-07-2024	ICAPWG/MIWG	Improve Duct-Firing Modeling Kickoff https://www.nyiso.com/documents/20142/42807168/Improve%20Duct%20Firing%20Modeling%20MDC_Kickoff_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

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Background

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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.

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2024 Proposed Market Design Details

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Limiting Participation

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Limiting Participation

- **Opt-In Limiting Participation flag for CCGTs based on their ramp rate breakpoint pertaining to the duct-firing range.**
- **Opting in would prevent the duct-firing range from being used for:**
  - 10-min reserve and regulation products in DAM, RTD, and RTC.
  - 10-min reserve, regulation, and energy products in RTD-CAM.

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Limiting Participation– Example

- **Consider a Combined Cycle Gas Turbine Generator, equipped with Duct burners, has the following operating ranges and characteristics:**
  - Min Gen to 150 MW with a ramp rate of 10 MW/min (Normal operating range 1)
  - 150 to 250 MW with a ramp rate of 8 MW/min (Normal operating range 2)
  - 250 to 275 MW with a ramp rate of 3 MW/min (Duct-firing range)
- **If this unit opts for the limiting participation option, then**
  - This unit will not be scheduled for 10-min reserves and regulation beyond 250 MW in SCUC, RTC, RTD, and RTD-CAM.
  - It can be scheduled for 30-min reserves and Energy till 275 MW in SCUC, RTC, and RTD.
  - It can be scheduled for 30-min reserves until 275 MW and Energy until 250 MW in RTD-CAM.
    - If this unit is at 240 MWs prior to RTD-CAM activation, then this unit can be moved up to 250 MWs and not beyond that.
    - If this unit is at 255 MWs prior to RTD-CAM activation, then this unit will be maintained at 255 MWs during the RTD-CAM mode.
- **The emergency response rate (>=10 MW/min) would be utilized for scheduling the 10-min reserves until 250 MWs and 30-min reserves until 275 MWs.**
- **The normal response rates would be utilized for energy scheduling in SCUC, RTD, and RTC until 275 MW.**
- **The regulation response rate would be utilized for scheduling regulation until 250 MWs.**
  - The regulation response rate is taken to be the slowest of the three response rates.
  - The above unit's regulation response rate would be the slowest of the first two response rates (8 MW/min) since it is limited from participating in providing the regulation service beyond 250 MW.

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Limiting Participation– Details

- The participation limit will not apply for 30-min reserves and energy in SCUC, RTC, RTD and will not apply for 30-min reserves in RTD-CAM.
- The participation limit will be a registration parameter that has to be opted in by the unit and would have to be validated by MMA before the participation limit is activated for the unit.
- If these units are already present within the duct-firing range before the activation of any RTD-CAM mode, then these units will be held at that physical basepoint received prior to the activation.
- Limiting Participation option can be used by the unit to alleviate the transition time issue.

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RTD-CAM Enhancement

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RTD-CAM Enhancement: Prior Normal Response Rate

- This enhancement applies to all the combined cycle units with duct-burners (including the units that have opted for Limiting Participation option).
- These units will be moved using the normal response rate of the operating region that the unit was in prior to the activation of any of the RTD-CAM modes.
- This alleviates the concern of utilizing the emergency response rate to move these units into the duct-firing range and within the duct-firing range.

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RTD-CAM Enhancement: Prior Normal Response Rate

- **Consider the same unit from slide 9:**
  - Min Gen to 150 MW with a ramp rate of 10 MW/min (Normal operating range 1) (ERR is 10 MW/min)
  - 150 to 250 MW with a ramp rate of 8 MW/min (Normal operating range 2)
  - 250 to 275 MW with a ramp rate of 3 MW/min (Duct-firing range)
- **This unit has not opted for Limiting Participation option. Consider the following scenarios:**
  - If this unit is at 240 MWs prior to RTD-CAM activation, then this unit can be moved up/down using the 8 MW/min.
  - If this unit is at 255 MWs prior to RTD-CAM activation, then this unit can be moved up/down using the 3 MW/min response rate as opposed to using the Emergency Response Rate.

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Next Steps

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Multiple Ramp Rate Project Update

- A project description was drafted for Multiple Ramp Rates.
- This project will be offered for prioritization beginning in the 2025 prioritization process to allocate resources for studying the feasibility of the MRR design in a production level environment.
- However, provided resources are available after the implementation of Limiting Participation and RTD-CAM Enhancements, NYISO intends to begin studying the feasibility of the MRR design in 2025.

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Next Steps

- **July**
  - CIA Results.
  - Finalize tariff revisions.
- **August**
  - BIC/MC Vote

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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

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