Gas Constraints Whitepaper Update

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Whitepaper Overview

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Background

- The goal of this project is to reflect the potential impact of fuel constraints during varying winter load levels in Load Zones F-K in the installed reserve margin (IRM) model

- Historical gas production data and oil inventory data during winter conditions were analyzed to estimate gas and oil availability levels used to develop initial modeling recommendations

- The objective of the initial recommended modeling is to reflect a reasonable approximation of fuel availability under varying load scenarios
  - Improvements to the methodologies for future studies may be considered to develop more refined fuel availability assumptions as the system evolves and new data becomes available

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Important Considerations

- The available historical data does not contain the full scope of information that would be needed to assess all factors affecting estimated available fuel levels at different load levels (i.e., economic fuel switching, impact of liquified natural gas (LNG), local distribution company (LDC) demand, oil replenishment capability, etc.)
    - Gas availability levels at higher tiers are based on extrapolation beyond available data points
    - Oil availability levels are based on historical reported storage levels which capture some replenishment actions, but may not capture the full capability of replenishment
- The initial modeling recommendations contains specific load and constraint levels that are applicable for the 2025-2026 IRM study. These levels need to be continuously assessed to determine the appropriate assumptions for future studies to account for factors such as changes winter load and fuel procurement decisions/arrangements
- These additional considerations are not expected to have a large impact on the recommended modeling for the 2025-2026 IRM study
    - As system evolves (including the reliability risks during the winter season), it will be critical to refine/revise the fuel constraint model to account for the changing system conditions and the various factors impacting fuel availability

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Updated Fuel Constraint Modeling Recommendation

- Based on analysis of historical gas production and weekly fuel surveys, the NYISO developed the following initial recommendation of fuel constraints to model in the Preliminary Base Case (PBC) of the 2025-2026 IRM study

Tier	NYCA Load Conditions (MW)	Available Gas (MW)	Available Oil (MW)	Total Available Fuel (MW) (Gas + Oil)**	Illustrative Modeled Derate (Rounded MW)***
1	>26,000	375		11,375	8,600
2	25,000 - 26,000	750		11,750	8,225
3*	24,000 - 25,000	2,750	11,000	13,750	6,225
4*	23,000 - 24,000	4,500		15,500	4,475
5	22,000 - 23,000	5,500		16,500	3,475
6	<22,000	No Constraint		No Constraint	0

* Tier 3 and 4 load levels comprise the actual peak loads observed in recent winter operating conditions. The illustrative MW derates are generally consistent with the typical reduction in generator capability experienced during such operating conditions.

**Includes gas-only and dual fuel units

*** "Illustrative Modeled Derate" calculated based on the gas-only and dual fuel resources modeled in Load Zones F-K in 2024-2025 IRM Final Base Case (FBC) (ICAP: ~21,770 MW, UCAP: ~19,975 MW)

- **The NYISO recommends adjusting the available gas level in Tier 1 from 0 MW to 375 MW to allow for the likelihood that there is potentially some amount of gas available to generators in extreme conditions**
  - While the historical gas-fired production analysis indicated that 0 MW of gas is available at the highest tier according to the trendline, there is no actual production data at the load levels associated with Tier 1 and therefore is based on extrapolating beyond the observable data

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Potential Impacts of Initial Recommended Modeling

- The NYISO conducted test cases to assess the potential impact of the initial recommended modeling of fuel constraints (see Slide 5)

- These tests show that on the 2024-2025 IRM FBC database, the implementation of the initial recommended fuel constraints modeling increases the IRM by approximately 0.3% and has minimal impact on the locational requirements determined by the Tan45 methodology

Case	IRM (Delta)	J LCR (Delta)	K LCR (Delta)	G – J (Delta)
2024 – 2025 IRM FBC (Base Case)	23.1%	72.7%	103.2%	84.6%
Initial Fuel Constraint Recommendation (Tan45)	23.4% (+0.3)	72.7% (-)	103.2% (-)	84.6% (-)
2024 – 2025 IRM FBC Sensitivity (Respecting TSL floor values)	21.5%	81.7%	105.3%	81.0%
Initial Fuel Constraint Recommendation (Respecting TSL floor values)	21.7% (+0.2)	81.7% (-)	105.3% (-)	81.0% (-)

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Implementation for 2025-2026 IRM Study

- **The fuel constraints will be modeled for the first time during the IRM study for the 2025-2026 Capability Year, with the following schedule:**
  - The assumptions for the PBC will be finalized in July 2024, and the PBC will be completed in August 2024
  - The assumptions for the FBC will be finalized in October 2024, and the FBC will be completed in November 2024
- **For the PBC, the study will include the initial recommended modeling of fuel constraints applied to gas-only and dual fuel generators in Load Zones F-K**
  - Oil-only generating units in Load Zones F-K will be modeled with their full capability without the application of any fuel constraints for purposes of the PBC
- **For the FBC, the available oil modeled will be reevaluated following an assessment of the initial fuel availability election requirements proposed by the NYISO as part of its capacity accreditation rules, which are expected by August 1, 2024**
  - For the FBC, the available oil recommendation will consider both dual fuel and oil-only in Load Zones F-K

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Implementation for Future Years

- Following the initial year of implementation (2025-2026 IRM Study), during the PBC, the inputs to fuel constraints model will be based on the following information:
    - Refreshed historical analysis of gas production by adding most recent historical winter data to update the available gas
    - Available oil will remain the same as the assumption from the previous year FBC
- During the FBC, the fuel constraint modeling assumptions will be reevaluated for potential updates considering fuel availability elections each August by affected generators as part of the NYISO's capacity accreditation rules
    - Available gas portion remains unchanged from PBC
    - Available oil will be reevaluated after considering the fuel availability elections

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Future Considerations

- **The fuel constraints modeling is an important first step in properly reflecting winter risk in the IRM model**
- **On-going refinement and modeling updates should be considered with additional market intelligence and further research**
- **Areas for future modeling improvements include:**
  - Aligning the IRM database to properly reflect winter load conditions and winter peak load levels
    - Efforts to improve the current IRM load shape adjustment process to better reflect the winter load forecast is currently underway
  - Monitoring changing market behavior of firm fuel procurement and reassessing the methodology using the historical data trends
  - Assessing if potential additional factors (i.e., impact of LNG, economic considerations for fuel switching by dual fuel generators, LDC demand, oil replenishment capability, generator emissions restrictions) that may impact the historical production data need to be accounted for when determining the modeled fuel constraint assumptions
  - Aligning the IRM database to reflect additional winter-related modeling assumptions (e.g., winter transmission limits)
  - Monitoring the load growth during winter and adjust triggering load levels to represent appropriate conditions
  - Assessment of firm fuel elections as part of the NYISO's proposed capacity accreditation rules and reported fuel inventories
  - Need for research to potentially extend the modeling of fuel constraints to resources statewide based on fuel constraints beyond Load Zones F-K (i.e., extend to Load Zones A-E)
  - Enhancements to the modeling fuel constraints as future GE MARS improvements are implemented

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Next Steps

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Next Steps

- The NYISO anticipates seeking approval of the completed whitepaper at the NYSRC Executive Committee meeting on 4/12/2024

- Incorporate the fuel constraints modeling into the 2025-2026 IRM PBC as a parametric case, if accepted by the NYSRC

- Based on the accepted fuel constraint model, NYISO will review appropriate methodologies for Capacity Accreditation Factor (CAF) calculations related to fuel availability elections by generators
  - Considerations include the methodology for modeling the marginal proxy unit for the applicable CAF calculations
  - The discussion on CAF related topics will be conducted in the ICAP Working Group meetings

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Vision

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

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Questions?

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