# Western New York Transmission Constraints


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# Introduction

- At the June 23 MIWG meeting the NYISO was asked to present the factors contributing to Western New York transmission constraints
- This presentation identifies recent infrastructure changes and operational factors that contribute to real-time congestion

# Infrastructure Changes

| Date | Infrastructure Change | Impact |
|---|---|---|
| September 2012 | Dunkirk 3 & 4 (370 MW) Mothball | Increase western NY transmission flows |
| June 2013 | Dunkirk 1 (75 MW) Mothball | Increase western NY transmission flows |
| January - May 2015 | 2,605 MW of Western PJM Coal Station Retirements; Eastlake 1-3, Ashtabula 5, Lake Shore 18, Will County, Big Sandy 2, Clinch River 3, Shawville 1-4 | Increase western NY transmission flows |
| June 2015 | PJM Four Mile Station 230/115 kV tap 230 kV S. Ripley-Erie 69 (serving PJM load) | Increase western NY transmission flows |
| October 2015 | PJM Mainsburg Station 345/115 kV tap 345 kV Homer City-Watercure 30 (serving PJM load) | Increases western NY transmission flows |
| December 2015 | National Grid Five Mile Load Serving Substation | No material impact to flows<br>Avoids need for local commitment |

# Infrastructure Changes

| Date | Infrastructure Change | Impact |
|---|---|---|
| December 2015 | Dunkirk 2 (75 MW) Mothball | Increase western NY transmission flows |
| December 2015 | 230 kV Dunkirk – S Ripley out-service to address pre & post contingency reliability issues | Reduces western NY transmission flows |
| March 2016 | Huntley 67 & 68 Mothball (380 MW) | Increase western NY transmission flows |
| May 2016 | Western NY 230 kV Reactors | Reduces western NY transmission flows<br>Results in balance of Niagara 230 & 115 kV unit generation. |
| Spring 2016 | PJM Piercebrook (Farmers Valley) load serving substation, PJM 115 kV load served from 345 kV transmission | Increase western NY transmission flows |
| Spring 2016 | Liberty Panda Generation 800 MW connected to PJM E Towanda, south end of NY-PJM 230 kV | Increase western NY transmission flows |

# Lake Erie Loop Flow

- **Actual Lake Erie Loop Flow is a function of many factors:**
  - ***Inter-Regional RTO-RTO transactions (fluctuate hourly)***
  - ***Actual IESO-MISO PAR performance and associated assumptions for hourly transaction evaluations***
  - ***External RTO generation-to-load dispatch (fluctuates in real time)***
  - ***IESO overgeneration (fluctuates in real time)***
- **Hour Ahead Lake Erie Loop Flow forecasting is critical for efficiently evaluating next-hour transactions and avoiding unnecessary real-time market pricing volatility**

# Operational Factors

| Operational Factor | Impact |
|---|---|
| **Hour-Ahead Forecasting of Lake Erie Loop Flow**:<br>If more physical loop flow occurs in real time than was predicted when RTC evaluated economic transactions with IESO & PJM, then RTD may have insufficient or inefficient resources available to solve transmission constraints, resulting in unnecessary Western NY congestion pricing<br><u>On June 28, NYISO made the following enhancement</u>: | |
| 1. Cap the max value of loop flow to initialize RTC; do not allow the initialized CCW loop flow to exceed 0 MW | Decrease western NY congestion and unnecessary pricing volatility |
| 2. Cap the delta of loop flow between successive RTD initialization to +/- 75 MW | Decrease western NY congestion and unnecessary pricing volatility |

# Operational Factors

| Operational Factor | Impact |
|---|---|
| **Eastern NY-PJM PAR Operation**: Broader Regional Market protocols utilize Ramapo PAR operations to minimize central or eastern NY congestion. The NYISO modified this practice when ISO experiences western congestion | Reduce western NY transmission flows and congestion |
| **St Lawrence PAR Operation**: NYISO & IESO utilize St Lawrence PARs to mitigate congestion | Reduce western NY transmission flows and congestion |
| **Intra-day Load Forecast Performance**: Under-forecasted intra-day loads results in RTC under-scheduling all resources. Transmission constraints can then develop that can only be solved by the limited units available to RTD (sometimes in western NY) | Increase western NY congestion |
| **Higher Western NY Loads:** High western loads increase western 230 kV & 115 kV transmission flows | Increase western NY transmission flows and congestion |

# Operational Factors

| Operational Factor | Impact |
|---|---|
| **Wind Forecast:**<br>If western wind is under-forecasted between RTC and RTC, then RTD may have insufficient or inefficient resources | Increase western NY congestion |
| **Western Transmission Outages**:<br>Western transmission outages result in increased power flows on the in-service transmission aggravate western congestion | Increase western NY congestion |
| **Summer Thermal Ratings**:<br>Lower thermal asset ratings reduce the 230 kV & 115 kV transfer capability | Increase western NY congestion |
| **Transmission with Terminal Limitations**:<br>Transmission terminal equipment thermal ratings lower than conductor ratings aggravate constraints<br>* 230 kV Gardenville-Stolle Road 66 terminal thermal limitation has been identified in local transmission plans and plans are underway to upgrade terminal equipment | Increase western NY congestion<br><br>Upgrades in terminal equipments will reduce western NY congestion |

# Future Enhancements

| Future Enhancements | Impact |
|---|---|
| **Infrastructure Western NY Public Policy Projects:** Increase western NY transmission capability | Reduces western congestion, reduce productions costs, increase reliability. |
| **Improved OH Proxy Modeling**: Currently the OH-Michigan PARs are modeled as not controlling flows. One enhancement under consideration would be to represent the actual performance of these PARs. | Decrease western NY congestion during IESO transaction ramp periods |

**The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefit to consumers by:**

- ***Maintaining and enhancing regional reliability***
- ***Operating open, fair and competitive wholesale electricity markets***
- ***Planning the power system for the future***
- ***Providing factual information to policy makers, stakeholders and investors in the power system***

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