

NERC Interregional Transfer Capability Study (ITCS)

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Overview

Background

The Fiscal Responsibility Act of 2023 (Act) enacted on June 3, 2023 directed the ERO (*i.e.*, NERC), in consultation with each regional entity and transmission utility that has transmission interconnections with neighboring transmission planning regions to conduct a study of total transfer capability between transmission planning regions that contains:

1. Current total transfer capability, between each pair of neighboring transmission planning regions.
2. A recommendation of prudent additions to total transfer capability between each pair of neighboring transmission planning regions that would demonstrably strengthen reliability, within and among such neighboring transmission planning regions.
3. Recommendations to meet and maintain total transfer capability together with such recommended prudent additions to total transfer capability between each pair of neighboring transmission planning regions.

NERC was required to file the study with FERC no later than December 2, 2024.

ITCS Parts & Advisory Group

- **NERC established the Interregional Transfer Capability Study (ITCS) which consists of three parts: (1) transfer capability analysis, (2) recommendations for prudent additions to transfer capability, and (3) recommendations to meet and maintain transfer capability.**
- **Over the course of the study NERC consulted with the ITCS Advisory Group whose role was to provide insights, expertise, and inputs to the study scope, approach, results, and recommendations.**

Key Dates for the ITCS

- In August 2024 NERC issued their Part 1 assessment of transfer capability
- On November 4, 2024, NERC issued their recommendations for prudent additions to transfer capability and their recommendations to meet and maintain transfer capability (Parts 2 and 3 respectively)
- On November 19, 2024, NERC filed the ITCS with FERC
 - Final Report: https://www.nerc.com/pa/RAPA/Documents/ITCS_Final_Report.pdf
 - Report Summary: https://www.nerc.com/pa/RAPA/Documents/ITCS_Report_Summary_Final.pdf
- On December 27, 2024, the ITCS was published in the Federal Register. Comments to FERC are due by February 25, 2025.

NERC Documented Scope for the ITCS

- **The following are in-scope:**

- While there are many facets to reliability, the ITCS focuses on energy adequacy, the ability of the NERC bulk power system to meet customer demand at all times
- A common modeling approach to study the North American grid independently and transparently
- Evaluation of the impact of extreme weather events and hourly energy adequacy using current transfer capability and 10-year resource and load futures
- Recommendations of additional transfer capability between neighboring regions to address energy deficits when surplus is available
- Extensive consultation and collaboration with industry
- Reliability improvement as the sole factor in determining prudence

- **The following are outside of scope:**

- Resource adequacy
- Economic, siting, political, or environmental impacts
- Alternative modeling approaches – ITCS results may differ from other analysis
- Quantified impacts of planned projects
- Recommendations for specific projects, as additional planning by industry would be necessary to determine project feasibility
- Recent changes to load forecasts, renewable targets, or retirement announcements

Prudence

- **As required by the congressional directive, the ITCS includes recommended “prudent additions” to transfer capability.**
- **Within the final ITCS report, NERC defines “prudent additions” as potential transmission enhancements identified to mitigate grid reliability risks under especially challenging conditions**
 - NERC also identifies that “prudent additions mitigate identified instances of energy deficiency without regard to economic considerations”

Key Findings for New York

- **Specific to New York, the study recommends prudent additions for 3,700 MW of additional interregional transmission capability (1,800 MW increase with PJM and 1,900 MW with Quebec), even though the maximum deficiency is only projected to be over a limited period.**
 - It is also notable that this finding does not account for the Champlain Hudson Power Express HVDC tie with Hydro Quebec.

Part 1: Transfer Capability Analysis

Comparison of ITCS & NYISO Transfer Limit Results

- Transfer limits are a key input into the energy adequacy analysis
- Due to the differences in methodologies utilized by NERC relative to NYISO's established methods, the transfer capability on an interface can differ from a few hundred MW to several thousand MW
- The NYISO also recommends the use of emergency transfer limits as the energy adequacy analysis performed in the next stage focuses on extreme weather

Interface	Summer (MW)				
	ITCS	NYISO (Normal)	Delta	NYISO (Emergency)	Delta
			(NYISO Normal - ITCS)		(NYISO Emergency - ITCS)
NY to NE	1303	1600	297	1650	347
NE to NY	1660	1525	(135)	1525	(135)
Ontario to NY	2286	2000	(286)	2425	139
NY to PJM	913	1025	112	1525	612
PJM to NY	1356	2000	644	2000	644

Interface	Winter (MW)				
	ITCS	NYISO (Normal)	Delta	NYISO (Emergency)	Delta
			(NYISO Normal - ITCS)		(NYISO Emergency - ITCS)
NY to NE	2432	1800	(632)	1800	(632)
NE to NY	1359	1600	241	1600	241
Ontario to NY	2719	2475	(244)	3075	356
NY to PJM	4019	2425	(1,594)	2625	(1,394)
PJM to NY	4814	2425	(2,389)	2625	(2,189)

NYISO Comments on Part 1

- **Although the ITCS provides a 10-year look ahead, the transfer limit analysis performed in this study only includes representations for Summer 2024 and Winter 2024/25**
 - The impact of planned future changes in generation, transmission, and load were not considered in the development of transfer limits
- **The contingencies evaluated for transfer limits includes a limited set of NERC design criteria events including: (1) loss of individual generators, (2) loss of single transmission lines (100 kV and above), and (3) loss of single transformers with a low-side voltage of 100 kV or above**
 - The contingency events only include a subset of NERC TPL-001 P1 contingencies
 - Additional contingencies such as towers, bus faults, or stuck breakers were not included
- **While the study evaluates extreme weather, the transfer limits performed do not consider emergency transfer criteria**
- **The transfer limits do not consider typical transfer source and sink pairings such as those included in the Comprehensive Area Transmission Reviews or Operations Studies**
- **However, NERC did consider to a certain extent the actions of phase-angle regulators (PARS) impacting New York tie-lines**

Part 2: Prudent Additions

Energy Adequacy Analysis

- In addition to the transfer capabilities identified in Part 1, the energy adequacy analysis also includes:
 - A selection of 12 different weather years which is fed as input into the availability of weather-driven generation and demand
 - The study includes a range of load conditions which are time-synchronized and correlated with respect to weather
 - The generation resource mix portfolios aligned with the 2023 LTRA, including existing generators, retirements, Tier 1 resources, and a portion of Tier 2 resource additions to create the portfolios for 2024 and 2033

Capacity and Load Data (in MW)		
Resource Type	2024	2033
Thermal	31,114	31,079
Hydro	4,921	4,921
Variable Renewable	9,114	15,322
Energy Limited	1,983	1,983
Total	47,132	53,305

Note: Thermal and hydro values represent winter ratings

Summer Peak	31,496	34,345
Winter Peak	24,161	31,467

Note: Median peak demand across all weather years

Comparison of ITCS Inputs to NYISO Studies

- When comparing the capacity and demand from the ITCS compared to key NYISO studies such as the Outlook and the RNA there are significant differences in the assumed generation capacity and demand

	Summer 2033	
	Capacity (MW)	Demand (MW)
NERC ITCS	39,429	40,566
2024 RNA	42,262	32,650
2023-2042 Outlook (2)	-	-
Base	51,761	35,546
Contract	68,055	35,546
Policy Case: Lower Demand Scenario	71,556	31,557
Policy Case: Higher Demand Scenario	77,904	36,589
Policy Case: State Scenario	84,299	34,033

Notes

(1) See NYISO 2024 RNA Appendix F, Figure 43

(2) See NYISO 2023-2042 System & Resource Outlook, figure 16. For comparison the NYISO has utilized the 2035 values.

ITCS Energy Adequacy Findings for New York

Impact of Weather Years (WY) on Planned Year 2024												
Weather Year	WY2007	WY2008	WY2009	WY2010	WY2011	WY2012	WY2013	WY2019	WY2020	WY2021	WY2022	WY2023
Maximum Resource Deficiency (MW)	0	0	0	0	0	0	0	0	0	0	0	1,242
Total Resource Deficiency (GWh)	0	0	0	0	0	0	0	0	0	0	0	4
Annual Hours of Resource Deficiency	0	0	0	0	0	0	0	0	0	0	0	7
Impact of Weather Years (WY) on Planned Year 2033												
Weather Year	WY2007	WY2008	WY2009	WY2010	WY2011	WY2012	WY2013	WY2019	WY2020	WY2021	WY2022	WY2023
Maximum Resource Deficiency (MW)	0	81	0	3,244	1,748	2,631	1,229	0	0	0	0	3,729
Total Resource Deficiency (GWh)	0	<1	0	18	7	15	3	0	0	0	0	31
Annual Hours of Resource Deficiency	0	2	0	12	7	12	4	0	0	0	0	15

- For planned year 2024 only weather year 2023 resulted in a deficiency (1,242 MW, 4 GWh, 7 hours)
- For planned year 2033 several weather years are deficient with the largest deficiency observed for weather year 2023 (3,729 MW, 31 GWh, 15 hour)

“Prudent Additions” for New York

- Based on the results of the energy adequacy assessment to meet the maximum observed deficiency, the ITCS report identifies the additions of 1,800 from PJM and 1,900 MW from Hydro Quebec as “prudent additions.”

NYISO Comments on Part 2

- **The ITCS definition of “prudence” is incredibly limited relative to the typical consideration of prudence in transmission planning, especially economics.**
- **In consideration of the possible pathways to achievement of state policy objectives for the CLCPA explored in the Outlook, the NYISO expects significantly more generation installed within New York than what was assumed in the ITCS.**
- **The ITCS does not give sufficient information as to the solar, wind, and other necessary conditions to give a full assessment of how these projected resource additions reported in the Outlook could impact the observed energy deficiencies.**

Part 3: Meet and Maintain Transfer Capability

Meeting and Maintaining Transfer Capability

- **NERC recognizes that their recommended increases to transfer capability does not specify a particular set of projects or approach to addressing the observed deficiencies**
- **NERC also recognizes that there are multiple options to address deficiencies such as**
 - Increasing interregional transfer capability to neighbors anticipated to have surplus resources
 - Local generation additions
 - Increased demand resource resources
 - Accept the identified risks during extreme events
- **The NYISO also recognizes that NERC has various reliability standards in the development process to address energy adequacy**
 - Project [2022-03](#) Energy Assurance with Energy-Constrained Resources
 - Project [2024-02](#) Planning Energy Assurance
- **Additionally, NERC stakeholders recently approved NERC standard TPL-008 (project [2023-07](#)) which establishes transmission system planning performance requirements for extreme heat and cold temperature events**

Additional Comments

Additional NYISO Comments

- **Interregional transfer capability needs should be informed by the same entities responsible for determining transmission security and resource adequacy needs (Planning Coordinators).**
- **Determining prudent additions for additional transfer capability should be informed not only by the ability to enhance system reliability, but also the cost of those enhancements, the ability to assign such costs to beneficiaries, and overall benefit/cost ratio versus other potential options, such as generation resource additions, demand side management or implementation of operational measures.**
- **The purpose of adding transfer capability to enhance reliability and resiliency, especially during extreme weather, is that generation will be available for transfer under such conditions. Increasing transfer capability through upgrades to existing transmission facilities or building additional transmission is not a guarantee that the transfer capability will be available during the event, or that sufficient generation will be available to use the transfer capability. These factors must be balanced in consideration of any transmission upgrades.**

Questions?

Our Mission and 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

