10 Krey Boulevard ♦ Rensselaer, NY 12144

**DRAFT FOR DISCUSSION**

January 12, 2010

**ELECTRONICALLY SUBMITTED**

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: New York Independent System Operator, Inc.'s Report on Broader Regional Markets; Long-Term Solutions to Lake Erie Loop Flow;
Docket No. ER08-1281-___.

Dear Secretary Bose:

In accordance with paragraph 6 and ordering paragraph "B" of the Federal Energy Regulatory Commission's ("Commission's") July 16, 2009 *Order Authorizing Public Disclosure of Enforcement Staff Report and Directing the Filing Of an Additional Report* in Docket No. ER08-1281-000 (the "July Order"),[1] and in accordance with paragraphs 8 and 9 of the Commission's *Order Granting Clarification* that was issued on September 14, 2009 in Docket No. ER09-1281-003[2], the New York Independent System Operator, Inc. ("NYISO"), hereby submits this *Report on Broader Regional Markets; Long-Term Solutions to Lake Erie Loop Flow* ("Report"). Ordering paragraph "B" of the July Order instructs the NYISO to "develop and file a report on long-term comprehensive solutions to the loop flow problem, including addressing interface pricing and congestion management, and any associated tariff revisions, within 180 days of the date of this order." Paragraph 9 of the Order Granting Clarification instructs the NYISO to "address, in its 180-day report, *all* solutions to the Lake Erie loop flow problem, including but not limited to: (i) the implementation status of the Ontario-Michigan PARs; (ii) the progress that has been made on the operating agreements for the Ontario-Michigan PARs; and, (iii) the complementary role that physical controls will play in the comprehensive solution to the Lake Erie loop flow problem."

While the NYISO is responsible for submitting this Report to the Commission, it cannot take sole credit for developing (or even drafting) the proposed solutions to Lake Erie loop flow that are described herein. Rather, the contents of this Report, and of the white papers and presentations attached hereto, were developed through collaboration between and among PJM Interconnection, LLC ("PJM"), the Midwest Independent Transmission System Operator, Inc.

[1] *New York Independent System Operator, Inc.*, 128 FERC ¶ 61,049.

[2] *New York Independent System Operator, Inc.*, 128 FERC ¶ 61,239.

("Midwest ISO"), the Ontario Independent Electricity System Operator ("IESO") and the NYISO, with input from the stakeholders of the foregoing ISOs and RTOs. The collective recommendation of the ISOs and RTOs is to implement a series of market solutions, including: (a) Buy-Through of Congestion, (b) Congestion Management/Market-to-Market Coordination, (c) Interface Pricing Revisions, and (d) Interregional Transaction Coordination. These proposed market solutions are described in **Section II** of this Report. In addition to the proposed market solutions, IESO and the Midwest ISO are pursuing the implementation of Phase Angle Regulator ("PAR") devices on the free flowing ties between Ontario and Michigan. The possible operation of the PARs at the Ontario-Michigan border to better align actual power flows to schedules, along with other efforts to coordinate the use of physical controls within the four ISO/RTO region, is addressed in **Section III** of this Report.

As described in **Section VI** of this Report, the NYISO is working to implement several aspects of the Broader Regional Market solutions proposed in this Report with ISO-New England ("ISO-NE"). As explained in **Section II.E** of this Report, Hydro Quebec TransEnergie has volunteered to work with the NYISO to pioneer the NYISO's initial implementation of the proposed Interregional Transaction Coordination solution, whereby the scheduling of real-time transactions between neighboring markets will occur on a more frequent (quarter hour or five minute) basis.

The NYISO would like to take this opportunity to thank the participating ISOs and RTOs, their Boards of Directors,[3] their stakeholders, and Hydro Quebec for complying with both the letter and spirit of the Commission's encouragement that "all interested parties … pursue a constructive, workable consensus addressing these matters as expeditiously as possible."[4] The identification of a comprehensive set of market solutions in this Report would not have been possible if entities like PJM Interconnection, the Midwest ISO and IESO had not each shouldered a significant share of the burden.

The NYISO hopes and expects that the cooperative effort that has permitted the ISOs and RTOs to expeditiously develop the Broader Regional Market solutions that are described in this Report and detailed in the white papers that are attached hereto, will continue until all of the solutions described in this report have been fully implemented. As explained in **Section VII** of this Report, the ISOs and RTOs expect to begin implementing the first of the proposed market solutions in 2011, but does not expect some solutions to be in place until 2012, or later. The proposed implementation schedule should provide adequate time to address the details of implementing each of the proposed solutions, and also allows further opportunities for stakeholder review of and input regarding the proposed solutions.

[3] The Boards of Directors of the various ISOs and RTOs have taken an active interest in ensuring the timely development of effective solutions to Lake Erie loop flow.

[4] July Order at P. 6.

## I. Documents Submitted

1. Broader Regional Markets, Long Term Solutions to Loop Flow white paper prepared by Midwest ISO, PJM Interconnection, IESO and NYISO ("Attachment A")[5];

2. Broader Regional Markets, Developing Solutions to Lake Erie Loop Flow, presentations prepared by IESO, Midwest ISO, PJM Interconnection and NYISO that were presented to stakeholders of the four ISOs/RTOs at a technical conference held on December 15, 2009 in Carmel, Indiana ("Attachment B");

3. Broader Regional Markets, Solutions to Loop Flow presentations prepared by IESO, Midwest ISO, PJM Interconnection and NYISO that were presented to stakeholders of the four ISOs/RTOs at a technical conference held on October 29, 2009 in Albany, New York ("Attachment C");

4. *Northeast ISO Seams Resolution Report for the third quarter of 2009, issued October 19, 2009 ("Attachment D"); and

5. Overview of Proposed Implementation of Broader Regional Market Solutions by ISO New England and New York ISO ("Attachment E").

*The NYISO has attached the Northeast ISO Seams Resolution Report for the third quarter of 2009 ("Seams Report") to this Report in order to make clear that the Broader Regional Market solutions proposed in this report are neither expected, nor intended to comprehensively resolve all existing coordination or seams issues between the participating ISOs and RTOs. Opportunities for enhanced coordination that are not addressed by the Broader Regional Markets solutions proposed in this Report are identified in the Seams Report.

## II. Summary of Proposed Broader Regional Market Solutions

The ISOs and RTOs have developed four Broader Regional Market solutions. A prerequisite to implementing the Buy-Through Congestion and Congestion Management/Market-to-Market Coordination solutions is the completion of the North American Electric Reliability Corporation's ("NERC's") Parallel Flow Visualization tool, which will significantly improve the

[5] **Attachment A** is the latest draft of a white paper that describes the proposed Broader Regional Market solutions to Lake Erie loop flow in far greater detail than this Report. Earlier versions of the white paper were distributed for discussion at the October 29, 2009 technical conference in Albany, New York and the December 15, 2009 technical conference in Carmel, Indiana. The attached version addresses/responds to many stakeholder concerns that were raised at the technical conferences. For example, provisions adding payments/credits for the scheduling of transactions that relieve transmission congestion were added to **[page 25]** of the white paper based on stakeholder input.

ability to accurately perform generation-to-load calculations and will make available common and consistent information regarding the sources of power flows and their impacts. The proposed Buy-Through of Congestion solution is designed to address loop flow by allocating a more complete and accurate measure of the costs caused by external transactions, such as imports, exports and wheels-through, to the cost-causing transactions. The proposed Interface Pricing Revisions, address existing seams between markets that tend to exacerbate loop flows. The Congestion Management solution (referred to as "Market-to-Market Coordination") is expected to reduce the cost of addressing transmission congestion within the region, while Enhanced Interregional Transaction Coordination will reduce the risk/exposure to congestion costs experienced by entities that schedule inter-Control Area transactions, and is expected to provide other financial benefits to participating markets.

The desired outcome (a long-term solution to Lake Erie circulation) can best be achieved by the collective implementation of all of the proposed initiatives. Individually, each initiative only addresses a component of the Lake-Erie loop flow problem, and provides limited benefits in terms of improved market efficiency. Implemented as a group, the proposed solutions are expected to produce far greater benefits. For example, Buy-Through of Congestion addresses the scheduling of external transactions, but does not address the beneficial or detrimental impact that scheduling a particular mix of generation to serve control area load may have on a neighboring market. Congestion Management addresses this gap by permitting a control area to schedule its generation in a manner that will result in the lowest overall regional cost to resolve system constraints. Interregional Transaction Coordination allows for more frequent region-to-region interchange which will improve the efficacy and responsiveness of both the Buy-Through of Congestion and Congestion Management solutions. The combined capabilities of the proposed solutions offer the potential to reduce uplift costs associated with real-time event management and congestion management, to improve the capability to incorporate intermittent resources, and to lower total system operating costs.

A summary explanation of the Parallel Flow Visualization Tool and of each of the four proposed Broader Regional Market solutions is set forth below. A significantly more detailed description of each of the items described below is available in **Attachment A** to this Report. **Attachment A** is a white paper that was prepared by the ISOs and RTOs and distributed to stakeholders for comment and discussion at technical conferences that were held on October 29, 2009 in Albany, New York, and on December 15, 2009 in Carmel, Indiana.[6]

### A. Parallel Flow Visualization Tool

Network flows on an interconnected grid are the composite result of all the individual actions taken in the interconnected regions to dispatch generation to meet their load, to direct

[6] As explained in **fn. 5**, **Attachment A** is the latest draft of the white paper. Earlier versions were distributed for discussion at the two technical conferences.

flow on controllable facilities, and to transfer energy between regions. No single region currently has access to sufficient information to decompose line and flowgate flows into the unique sources of those flows.

The Parallel Flow Visualization Tool will assemble the necessary real-time data to perform the generation-to-load calculations, facilitate the calculation of impacts and make available common and consistent information regarding the sources of power flows and their impacts to all regions. The Parallel Flow Visualization Tool will distinguish the source of flow between (a) each separate region's impacts associated with generation-to-load dispatch and (b) individual transaction impacts.

The NERC Interchange Distribution Calculator ("IDC") Working Group is currently tasked with defining the necessary data reporting requirements and developing with Open Access Technologies, Inc. ("OATI") the specification for performing a market flow calculation. Accurate and timely data reporting by Balancing Authorities will be required to support the accurate computation of market flows.

The future market flow calculation process will require some entities to provide significantly more data, and on a more frequent basis than is currently supported. The magnitude of the expected benefits will be directly tied to the quality of the data reporting. The ISOs and RTOs support the accurate, complete and timely reporting of the necessary information to achieve the region wide implementation of the parallel flow visualization process and the visibility it provides to market flow impacts. The information that will be provided by the Parallel Flow Visualization Tool is required to support the implementations of Congestion Management and Buy-Through of Congestion Broader Regional Market solutions to Lake Erie loop flow and will augment the information available in the IDC (and available for the NERC Transmission Loading Relief "TLR" procedures) to address impacts from Lake Erie loop flows.

If NERC, or OATI, is unable to (timely) develop the Parallel Flow Visualization Tool, alternative solutions will need to be developed to obtain the information that is necessary to implement the Congestion Management and Buy-Through of Congestion Broader Regional Market solutions. To support the ISOs and RTOs efforts to timely implement the Broader Regional Market solutions, the ISOs and RTOs will evaluate by June 1st 2010 the state of the Parallel Flow Visualization implementation. If the solution is determined to be abandoned, unsupportable, or unachievable, the ISOs and RTOs will pursue alternative solutions to the visibility initiative in an effort to maintain the proposed solutions implementation timelines.

## B. Buy-Through of Congestion

### 1. Explanation of Solution

The current practice for scheduling of interregional transactions only requires scheduling parties to pay for the congestion charges assessed by the control areas that are part of the

"contract path" over which an external transaction is scheduled. The impact that power flows associated with an external transaction may have on Balancing Authorities that are not included in the contract path are not considered in the scheduling process and the costs incurred by off-contract path Balancing Authorities are not charged to the scheduling entity. Buy-Through of Congestion addresses this shortcoming by more completely assessing the congestion charges associated with scheduling an interregional transaction to the scheduling entity.

The movement of power from Balancing Authority to Balancing Authority is typically scheduled on a particular "contract path." In reality, power moves consistent with the laws of physics and the relative impedances of the various elements of the transmission system, and actual power flows can be quite different from the path over which a particular transaction is scheduled to flow.

Managing power that flows in a manner that is not consistent with the contract path over which an external transaction is scheduled to flow can be a costly endeavor, particularly when the associated uncontrolled off-contract path loop flow causes congestion on prime transmission corridors in Balancing Authorities that do not have the transaction scheduled in their markets. The NERC TLR procedures provide a blunt instrument for addressing the off-contract path impacts of scheduled transactions. Invoking the TLR procedures may result in market and operational inefficiencies because TLR requires the curtailment of expected energy deliveries without regard to economic rationing principles. The TLR process does not take into account the scheduling party's possible economic willingness to pay to maintain its transaction schedules, nor does the TLR process account for or assess the economic benefit of moving power between regions. More efficient utilization of the transmission network can be achieved and more accurate transaction scheduling decisions can be made if the cost of managing off-contract path congestion can be calculated and appropriately allocated to the scheduled power transfers that caused the congestion.

The Buy-Through of Congestion bidding features will allow the scheduling party to indicate if it is, or is not, willing to pay the congestion charges caused by its transactions off-contract path flow impacts. If a transaction party indicates it is not willing to pay congestion charges its transaction will be removed if the off-contract path flows created by the transaction adds to the congestion costs in a participating off-contract path ISO or RTO. Once removed, the transaction will not be reinstated until the neighboring ISO/RTO indicates that the congestion on the impacted flowgate has been removed. Transactions that are not willing to pay congestion charges will not incur such charges for the period of time necessary to remove the transactions after congestion is identified.

The objective of the Buy-Through of Congestion Broader Regional Market solution is to (a) identify the sources of loop flow caused by Balancing Authority to Balancing Authority schedules via the NERC IDC Parallel Flow Visualization Tool, (b) determine the costs incurred in supporting the loop flows by each impacted region, as indicated by their locational marginal

prices or equivalent, and (c) allocate the costs incurred by the off-contract path Balancing Authorities to the scheduling entity, or remove the associated schedules if the scheduling entity is not willing to pay the full cost of flowing its transaction(s). The Buy-Through of Congestion processes will result in a more complete identification of and accurate assignment of the costs to move power between regions and provide an economic alternative to the administrative/physical TLR curtailment processes. IESO, Midwest ISO, PJM Interconnection and NYISO all plan to participate in developing and implementing the Buy-Through of Congestion Broader Regional Market solution.

Even after the Buy-Through of Congestion process is implemented, TLR will remain available as a reliability backstop to address circumstances where the proposed Buy-Through of Congestion solution is not able to provide timely, or does not provide sufficient constraint relief to protect system reliability.

### 2. Expected Benefits

The Buy-Through of Congestion Broader Regional Market solution will provide more accurate price signals because it requires scheduling entities to pay, and permit off-contract path Balancing Authorities to recover, the full congestion cost associated with scheduling an external transaction (import, export or wheel-through). The solution also provides an economic alternative to the market and operational interruptions that occur when the TLR process is invoked. Both of these benefits will result in more efficient utilization of the transmission network.

### 3. Stakeholder Concerns

In discussions with stakeholders, the Buy-Through of Congestion has been the most controversial of the Broader Regional Market solutions proposed by the ISOs and RTOs. However, from the NYISO's perspective, it is the most important solution because it is the solution that will ensure that entities scheduling transactions around Lake Erie pay the full/true cost of achieving their transaction schedule, including the congestion/redispatch costs incurred by off-contract path markets that are necessary to permit the scheduled transaction to be delivered.

Stakeholder concerns have focused in two areas. First, stakeholders have expressed a desire that they be able to submit, as a component of an external transaction bid, an indication of the total amount of congestion they are willing to pay to off-contract path control areas before the transaction must be removed (an "up to" congestion bid). Second, stakeholders have taken the position that purchasing "firm" transmission service over a transaction's contract path should either excuse the firm transaction from paying the costs of congestion caused in off-contract path markets, or should require the removal of all non-firm transactions before firm transactions can be assessed congestion charges for their impact on off-contract path markets. Both of these concerns are briefly addressed below. However, the ISOs and RTOs expect to take up and

thoroughly vet these issues as part of the implementation and stakeholder review processes that are described in **Section V** of this Report.

Several stakeholders have requested that the Buy-Through of Congestion solution include the ability to specify a real-time "up-to" congestion charge limitation, indicating the maximum amount of off-contract path congestion the entity scheduling a transaction would be willing to pay. The ISOs and RTOs recognize that Buy-Through of Congestion will (appropriately) result in cost risk exposure being transferred from each regions internal loads (which are currently responsible for uncollected congestion charges) to the transacting parties whose schedules produce the off-contract path congestion. The ISOs and RTOs are committed to providing the necessary data transparency and visibility of projected and occurring congestion costs to allow traders to consider their cost exposure when requesting a schedule or alternatively to terminate their schedules upon observations of congestion charge allocations. The ISO's additionally acknowledge the need to develop the necessary congestion cost hedging products to allow traders to purchase the congestion management product at specified values within the respective Day-Ahead Markets, where applicable. Past experience has not shown the need for an up-to congestion product to be necessary if there is adequate real-time price transparency around price differences. The ISOs and RTOs response to the desire expressed by stakeholders to incorporate up to congestion bids in the Buy-Through of Congestion Broader Regional Market solution is addressed in greater detail on pages 15 – 18 of the white paper that is included as Attachment A to this Report, and in the presentation titled *Management of Congestion Cost Exposure* that is included in Attachment B to this Report.

Stakeholders have also expressed concern that scheduling "firm" transmission service along the contract path will not protect an external transaction schedule if the scheduling entity does not elect to pay for the congestion its transaction may cause in Balancing Authority areas that are not included in the external transaction's contract path. In fact, it is possible that a firm transaction that is not willing to pay off-contract path congestion could be removed before an otherwise identical non-firm transaction that elects to pay off-contract path congestion *if* both transactions are determined to be causing congestion that requires redispatch by an off-contract path balancing authority.

**[THIS PORTION OF THE REPORT IS NOT YET COMPLETE. THE ISOs AND RTOs ARE WORKING TOGETHER TO DEVELOP A RESPONSE TO THE IDENTIFIED STAKEHOLDER CONCERN.]**

### C. Congestion Management/Market-to-Market Coordination

In paragraph 6 of the July Order, the Commission instructed the NYISO to address Congestion Management in this Report. PJM Interconnection and the NYISO have agreed to work together to implement Congestion Management (called Market-to-Market Coordination) at their common border. The proposed implementation timeline is coincident with the proposed implementation timeline for Buy-Through of Congestion. A summary description of the

proposed solution is set forth below. Please see pages 26 to 34 of the white paper that is included as Attachment A to this Report for additional details explaining how Market-to-Market Coordination is expected to operate.

A highly interconnected transmission network provides benefits of improved operational reliability and redundancy. However, a necessary byproduct of synchronously interconnected control areas are loop flows resulting from a regions dispatch of its resources to meet its own load requirements. While loop flows can cause or aggravate constraints in a neighboring control area, the synchronous interconnection of neighboring markets also presents the opportunity for multiple control areas to act to relieve transmission congestion on the interconnected system.

The re-dispatch of generators within a control area that is interconnected with the control area that is experiencing the congestion may be able to address transmission constraints more cost effectively than the re-dispatch of generators or other control action taken by the congested control area. A Congestion Management, or Market-to-Market Coordination, protocol (1) allows for inter-control area dispatch to manage congestion if, and to the extent, a neighboring control area can re-dispatch resources to alleviate the congestion at a lower cost than the control area that is experiencing the congestion, and (2) permits the appropriate settlement (payment) based on the facts and circumstances of each situation.

In order to effectively implement Market-to-Market Coordination it is necessary to (a) pre-identify constraints that multiple control areas can address through re-dispatch actions, (b) develop an agreed to baseline of allowable usage of each others transmission networks, and (c) establish data sharing protocols to communicate real-time constraint management costs between Balancing Authorities. After-the-fact calculation of settlement charges will be performed to provide compensation for the dispatch action when the system flows are less than pre-defined baseline values. Overuse of a neighboring control area's transmission system that results in costs to the neighboring control area must be redressed. Market-to-Market Coordination will be incorporated directly into a regions dispatch and price setting protocols to maintain the existing consistency between resource schedules and prices. No other explicit charge or refund is necessary to a specific resource.

Expected benefits of implementing the Market-to-Market Coordination solution include:

- Lower congestion costs. The ability to use lower cost resources in a neighboring control area to address transmission constraints is expected to reduce the overall cost of managing transmission congestion.
- More consistent pricing across ISO/RTO borders. When Market-to-Market Coordination is in effect, prices at the border between two control areas are expected to converge more closely. For example, under Market-to-Market Coordination, a resource located in PJM could be setting the price, or determining the shadow cost of relieving a New York transmission constraint (or *vice-versa*).

- More reliable operation. Because economic generation in another RTO/ISO is now available to address transmission constraints (broader pool of available resources), the participating markets should experience fewer emergency transmission operations.

As explained above, Market-to-Market Coordination can achieve a more cost effective utilization of the region's collective assets to address constraints across multiple systems, resulting in lower overall congestion costs to consumers and provides a more consistent price profile across markets. The Market-to-Market Coordination details currently being considered are largely based on the existing Market-to-Market coordination program that is currently in place between the Midwest ISO and PJM Interconnection, a program with which the Commission and stakeholders are already familiar.

### D. Interface Pricing Revisions

In paragraph 6 of the July Order, the Commission instructed the NYISO to address Interface Pricing in this Report. The Midwest ISO, PJM Interconnection and the NYISO have agreed to implement comparable interface pricing methods at their common borders. IESO is still in the process of determining its intended participation in the measure described below.

Efficient and compatible interface proxy bus prices will improve the interconnected markets' ability to efficiently transfer power within the four ISO/RTO region. Potential improvements to interface pricing methods have been identified both (1) at times when there is no, or limited ability to conform actual power flows around Lake Erie to scheduled power flows, and (2) at times when Phase Angle Regulators ("PARs") and other control devices are able to conform actual power flows to scheduled power flows within reasonable tolerances. In recognition of the overall objective of harmonizing market rules across the region, the NYISO proposes to pursue modifications to its interface pricing method that will apply at times when actual power flows are not consistent with scheduled power flows. Under these circumstances, the NYISO intends to propose adjustments to its external proxy bus pricing to:

- Recognize the incremental distribution of power flows around Lake Erie when evaluating and pricing the marginal impacts of transaction and generation schedules;
- Evaluate the need for, and scheduling rules surrounding, establishing an additional proxy bus location for the Midwest ISO to acknowledge power deliveries from or to the Midwest region; and
- Evaluate the continued applicability of the existing circuitous path prohibitions.

The ISOs and RTOs also recognize the importance of maintaining compatible and efficient interface proxy bus prices when the PARs at the Ontario – Michigan border are ultimately installed and available to mitigate Lake Erie loop flows. These devices are expected to have the ability to adjust actual power deliveries to be more consistent with scheduled power deliveries. Existing interface proxy bus pricing methods may not set accurate prices under all operating

scenarios and may require (a) additional pricing points to be created, or (b) the interface price weighting associated with current points to be adjusted, or (c) adjustments to incremental distribution of power flows to acknowledge power flows that are substantially consistent with the contract path of a transaction.

All of the participating ISOs/RTOs interface proxy pricing methods will need to be able to account for the ability of PARs to manage Lake Erie loop flows.

- At times when actual power flows are consistent with scheduled power flows, the pricing method used will treat power as flowing consistent with the contract path.
- At times when actual power flows do not conform to scheduled power flows (at times when there is loop flow), the interface proxy pricing methods will need to reflect the path over which power is actually flowing, which will not be entirely consistent with the contract path.

In implementing the methods described above, the ISOs and RTOs will also need to evaluate their ability to predict when the PARs will/will not be able to conform power flows to schedules around Lake Erie, and to incorporate the necessary assumptions into each ISO/RTO's respective Day-Ahead and Hour-Ahead Markets.

### E. Enhanced Interregional Transaction Coordination

Today, PJM Interconnection and the Midwest ISO provide the ability for market participants to enter into or back out of an energy transaction on a fifteen minute basis on some external interfaces. Enhanced Interregional Transaction Coordination will permit the scheduling of inter-control area transactions involving the NYISO on a more frequent basis than the current hourly schedules. Flexible transaction scheduling provisions improve market and operational efficiency by allowing resources schedules to adjust to the dynamic changes in system conditions, as well as unexpected changes to projected conditions. Desired additional flexibility must be balanced with the operational benefits associated with defined firm energy delivery schedules.

Flexible transaction scheduling requires advancements to the existing processes for the development of transaction schedules and the protocols for validation of those schedules. The existing process lacks the coordination and automation necessary to support a scheduling frequency sufficient to address dynamic system conditions. Transaction schedules must be co-developed, rather than independently evaluated, to ensure both regions arrive at the same outcome and the same expectations for energy delivery or receipt.

Enhanced Interregional Transaction Coordination is expected to lower total system operating costs through improved consistency of transaction schedules with market-to-market prices, to expand the pool of flexible assets that are available to balance intermittent power resources, to improve price consistency and transmission utilization and to address existing

uncertainties in forward looking scheduling horizons. As explained above, it will also serve to limit the risk an entity will face when it agrees to pay for the congestion its external transaction causes in off-contract path control areas because it will be possible to withdraw an accepted transaction should a dramatic intra-hour price change occur in an off-contract path market.

As indicated in **Section VII** of this Report, the NYISO anticipates implementing the Enhanced Interregional Transaction Coordination Broader Regional Market solution initially at the Chateauguay D/C intertie with the Hydro Quebec TransEnergie control area in 2011. Following successful implementation at Chateauguay and the development of additional software capabilities that will be needed to permit implementation at the NYISO's interfaces with PJM Interconnection, the NYISO anticipates implementing Enhanced Interregional Transaction Coordination on the Neptune and Linden VFT Scheduled Lines, followed closely by the broader New York/PJM interface. Implementation of Enhanced Interregional Transaction Coordination with ISO-New England is also planned, as described in Attachment E to this Report.

## III. Implementation and Effective Operation of Phase Angle Regulators to Control Loop Flows

Paragraph 9 of the Order Granting Clarification instructs the NYISO to "address, in its 180-day report, *all* solutions to the Lake Erie loop flow problem, including but not limited to: (i) the implementation status of the Ontario-Michigan PARs; (ii) the progress that has been made on the operating agreements for the Ontario-Michigan PARs; and, (iii) the complementary role that physical controls will play in the comprehensive solution to the Lake Erie loop flow problem." This Report addresses each of the issues identified in the Commission's Order below. The Report also addresses the ISOs and RTOs plan to perform a study that is ultimately expected to result in the drafting of regional PAR operating guidelines.

### A. Implementation Status of the Ontario-Michigan PARs

There is relay work being completed in Ontario that is necessary for the effective operation of the Ontario-Michigan PARs. This work is expected to be completed by the end of the first quarter of 2010. At that time it is expected that all of the Ontario-Michigan PARs will be available to provide service.

**[UPDATED INFORMATION HAS BEEN REQUESTED.]**

### B. Operating Agreement for the Ontario-Michigan PARs

It is the NYISO's understanding that IESO, the Midwest ISO, and International Transmission Company are working to develop a mutually acceptable operating agreement. No definite date (or even approximate date) can be provided with regard to when the operating

agreement will be executed and the PARs will be placed in service and used to better match actual power flows to scheduled power flows at the Ontario-Michigan border.

**[UPDATED INFORMATION HAS BEEN REQUESTED.]**

### C. Complimentary Role of Physical Controls in Developing Comprehensive Solution to Lake Erie Loop Flow

#### 1. Price Setting

As explained in **Section II.D** of this Report, at times when the coordinated operation of the PARs around Lake Erie is able to conform actual power flows to scheduled power flows within mutually agreed upon tolerances, the interface pricing method used by the ISOs and RTOs will treat power as flowing consistent with the contract path. At times when the actual power flows do not conform to scheduled power flows (at times when there is loop flow), the ISOs and RTOs interface proxy pricing methods will need to reflect the path over which power is actually flowing.

#### 2. Anticipated Interaction with TLR Process

At times when the coordinated operation of the PARs around Lake Erie is able to conform actual power flows to scheduled power flows within mutually agreed upon tolerances, the NERC IDC tool will recognize the delivery of transactions into and out of Ontario on contract path and will not identify external transactions as the source of parallel flows. At times when the actual power flows do not conform to scheduled power flows (at times when there is loop flow), the NERC IDC tools will identify external transaction as having parallel path impacts on flowgates based upon the current physical network configuration.[7]

#### 3. Regional Study and Development of Regional PAR Operating Guide

The operation of the PARs by the four markets around Lake Erie can influence the amount of circulation flows. PARs can be used to alter flows to follow a different electrical path. While PARs are capable of substantially mitigating/controlling loop flows, they are not capable of eliminating Lake Erie loop flows. Uncoordinated operation of the PARs around Lake Erie could increase circulation flows (the PARs could work at cross-purposes), so it is important that the operation of PARs by the four markets around Lake Erie be coordinated. A regional study will be initiated during 2010 to identify PARs and other controllable devices that are capable of influencing Lake Erie loop flows and to study the potential reliability and market

[7] The NYISO has some concerns that relate to when the PARs will be treated as adequately conforming actual to scheduled power flows. The NYISO plans to discuss its concerns with its neighboring ISOs and RTOs, and within the NERC process, if necessary.

impacts of their operation. This study will also identify significant regional paths or flowgates impacted by Lake Erie loop flows.

If the results of the regional study indicate that coordinated operation of regional PARs and other controllable devices is likely to provide substantial regional benefits, following any necessary updates to the existing Commission-accepted PAR operating protocols (which will require stakeholder involvement), regional operating guide recommendations will be developed and implemented by the ISOs and RTOs to better manage Lake Erie loop flow through the coordinated operation of the identified significant controllable devices. This effort will include implementing the necessary communications infrastructure and regional business processes to facilitate regional coordination of the identified controllable devices.

#### 4. Cost Allocation

Each of the ISOs and RTOs intends to cover its own costs of designing and implementing the solutions proposed in this Report. International Transmission Company ("ITC"), a member of the Midwest ISO, has indicated that it desires to recover an unspecified portion of the cost of facilities it owns at the Ontario-Michigan border from the broader region, and has invited other entities that own/operate PARs that can be used to mitigate Lake Erie circulation to participate in a plan whereby the cost of these devices would be recovered from the broader region.

**[THIS PORTION OF THE REPORT IS NOT YET COMPLETE.]**

## IV. Tariff Revisions Needed to Support Implementation of Proposed Broader Regional Market Solutions to Lake Erie Loop Flow

### A. Parallel Flow Visualization Tool

Possible concerns related to data sharing before the Parallel Flow Visualization Tool is actually being used to direct coordinated regional operation exist. Clarification by the Commission that "Transmission System Information"[8] includes within its scope information that

[8] Transmission System Information, or "TSI" is defined in Section 4.0 of the NYISO's Code of Conduct, which is set forth in Attachment F to the NYISO's Open Access Transmission Tariff.

> TSI is information: (1) that is commercially valuable and (2) access to which is necessary to buy, sell or schedule Energy, Capacity, Ancillary Services or Transmission Service. Examples of TSI include, but are not limited to, the following:
> - Available Transfer Capability;
> - Total Transfer Capability;
> - Information regarding physical Curtailments and Interruptions;
> - Information regarding Ancillary Services;
> - Pricing for Transmission Service; and

must be shared in order to design new systems that will be used to buy, sell or schedule energy and transmission service, could speed the Parallel Flow Visualization Tool development process.

### B. Regional PAR Coordination

Modifications to existing Commission-accepted PAR operating agreements may be necessary. Depending upon the nature of the regional PAR operating guideline that is ultimately produced, Commission acceptance of this guideline may also be necessary.

### C. Interface Pricing Revisions

The NYISO may have to make changes to its Market Administration and Control Area Services Tariff ("Services Tariff") and/or Attachment B to its Services Tariff and Attachment J to its Open Access Transmission Tariff ("OATT") to explain how and when each of the proposed methods of determining prices at external proxy buses will apply. If the NYISO determines that it needs to develop a separate proxy bus to represent the Midwest ISO (a control area that does not border the NYISO), then new rules will likely have to be added to address how this proxy bus will operate and how prices will be determined.

If the ISOs and RTOs determine that it would be appropriate to remove the eight path circuitous scheduling prohibition, changes to Attachment B to the NYISO's Services Tariff and Attachment J to the NYISO's OATT will be necessary to remove the prohibition.

### D. Buy-Through of Congestion

Implementation of the Buy-Through of Congestion Broader Regional Market solution will require significant new Tariff revisions to implement. Necessary revisions will likely include:

- Revisions to the Joint Operating Agreements between the four ISOs/RTOs.
- New settlement rules for calculating off-contract path congestion costs/credits and passing them to the market where a particular transaction is being settled for payment/recovery.
- New settlement rules to permit the ISOs and RTOs to charge for, or pay credits to, market participants that scheduled transactions that affected congestion in, but that were not scheduled through, one of the four ISO/RTO control areas.
- New bid parameters to permit entities scheduling external transactions to specify their willingness to pay for off-contract path congestion.

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• Discounts offered.

- Rules to permit ISOs and RTOs to take willingness to pay congestion in neighboring markets into account when choosing which external transactions to schedule.

- New hedging products to help market participants manage exposure to off-contract path congestion costs. These could include the ability to schedule virtual transactions at external proxy buses and other virtual products that are designed to help manage congestion exposure within a specific ISO/RTO control area. Complimentary additions to the market monitoring/market mitigation rules will likely be necessary to permit adequate policing of the expansion of virtual trading authority.

- Enhanced credit rules that account for the cost exposure presented by a possible obligation to pay congestion costs caused by an external transaction in a neighboring off-contract path market.

### E. Congestion Management/Market-to-Market Coordination

Implementation of Market-to-Market Coordination with PJM Interconnection and ISO-New England will likely require the following changes:

- Revisions to the NYISO's Joint Operating Agreements with both control areas.

- New settlement provisions to authorize the NYISO to pay a neighboring control area for relief provided, and to allocate payments that the NYISO receives from participating control areas.

- Development of rules for determining "entitlements" to use the capacity of a neighboring transmission system.

### F. Enhanced Interregional Transaction Coordination

Implementing Enhanced Interregional Transaction Coordination will require the NYISO to make changes to its Market Administration and Control Area Services Tariff ("Services Tariff") and/or Attachment B to its Services Tariff and Attachment J to its Open Access Transmission Tariff ("OATT") to explain how Real-Time Commitment and Real-Time Dispatch will schedule import and export transactions, and to explain the pricing rules that will apply to external transactions that are scheduled in fifteen minute or five-minute increments.

## V. Stakeholder Participation

### A. Technical Conferences

More than 100 stakeholder representatives participated (in person, or by phone) in the technical conference on Broader Regional Market solutions to Lake Erie loop flow that was held in Albany, New York on October 29, 2009. More than 90 stakeholder representatives participated (in person, or by phone) in the technical conference on Broader Regional Market solutions to Lake Erie loop flow that was held in Carmel, Indiana on December 15, 2009. The primary purpose of the technical conference that was held in Albany was to "roll out" the first draft of a detailed white paper describing the proposed Broader Regional Market solutions to stakeholders and to obtain their input on the ISOs and RTOs proposal. The ISOs and RTOs solicited written feedback from stakeholders at the first technical conference. Eleven parties responded to this request and provided comments on various components of the recommended solutions. Copies of the written stakeholder comments are available on the MISO's web site at:

http://www.midwestiso.org/publish/Folder/4dfde8_124a04ca493_-7c8e0a48324a

The presentations at the December 15, 2009 technical conference in Carmel, Indiana focused on addressing concerns raised by stakeholders at the Albany technical conference and/or in the written comments to the ISOs and RTOs.

### B. NYISO Committee Discussions

The NYISO has given more than a dozen presentations on various aspects of the proposed Broader Regional Market solutions to its stakeholders in 2009. The purpose of these presentations has been to ensure that New York stakeholders are adequately apprised of the status of the ongoing discussions between the ISOs and RTOs, and to solicit their input on the proposed long-term solutions to Lake Erie loop flow.

### C. Going Forward Process

The implementation schedule proposed by the ISOs and RTOs in **Section VII** of this Report is intended to allow sufficient time to work through the details of implementing the five proposed Broader Regional Market solutions to Lake Erie loop flow, and to address valid concerns identified by stakeholders.

## VI. Implementation of Broader Regional Market Solutions by NYISO and ISO-New England

In addition to the Broader Regional Market solutions to Lake Erie loop flow that will be implemented by PJM Interconnection, the Midwest ISO, IESO and the NYISO, ISO-New England and the NYISO have agreed to implement the Market-to-Market Coordination and Enhanced Interregional Transaction Coordination Broader Regional Market solutions. Due to the nature of the interconnection between NYISO and ISO-New England the development of the Buy-Through of Congestion market solution does not appear to be necessary at this time. The

NYISO and ISO-New England Boards of Directors have been significant participants in the effort to better coordinate the two neighboring markets.

The implementation of the proposed measures between the NYISO and ISO-New England is expected to better synergize these two Balancing Authorities' market rules. The Broader Regional Market improvements that will be implemented by the NYISO and ISO-New England are described in greater detail in **Attachment E** to this Report.

## VII. Proposed Implementation Schedule

The following "soft" schedule is proposed for implementing the Broader Regional Market solutions. It assumes the timely availability of a Parallel Flow Visualization Tool; preferably, the tool that is being designed by the NERC IDC and OATI but, in the alternative, a tool designed and implemented by the ISOs and RTOs. The proposed schedule is intended to provide sufficient time for the ISOs and RTOs to address the numerous details that still need to be addressed before the proposed solutions can be implemented, and to obtain necessary regulatory approvals. The proposed schedule is also intended to provide sufficient time and opportunity for stakeholder input prior to the implementation of each of the proposed solutions. The below schedule was presented to stakeholders at the December 15, 2009 technical conference that is included as Attachment B to this Report. *See* slide number 70.

**Potential/Proposed* Implementation Timeline**

| | |
|---|---|
| • Parallel Flow Visualization | |
| – Software Ready | 4Q – 2010 |
| – Parallel Operations | 4Q – 2011 |
| • Regional PAR Coordination Operating Guide | |
| – Initiate Regional Study | 2Q – 2010 |
| • Interface Pricing Revisions | |
| – NYISO Revisions - Design | 2Q – 2010 |
| • Buy-Through of Congestion | |
| – Design Development | 4Q – 2010 |
| – Implementation | 3Q – 2011 |
| • Congestion Management | |
| – PJM-NYISO Implementation | 3Q – 2011 |
| – Extend to Additional Regions | 2012 |
| • Interregional Transaction Coordination | |
| – Energy Scheduling with NY/HQ | 1Q – 2011 |

| | |
|---|---|
| – Energy Scheduling with NY/PJ | 4Q – 2011 |
| – Extend to Additional Regions | 2012 |

*Prospective timeline pending design development and approval from Market Participants, neighboring Control Areas and the Commission.

## VIII. Communications

Communications and correspondence regarding this Report should be directed to:

Rana Mukerji, Vice President of Market Structures
Robert E. Fernandez, General Counsel
*Robert Pike, Director of Market Design
Elaine D. Robinson, Director of Regulatory Affairs
*Alex M. Schnell
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, N.Y. 12144
Tel: (518) 356-8707
Fax: (518) 356-7678
rpike@nyiso.com
aschnell@nyiso.com

*Persons designated for receipt of service.

## IX. Service

The NYISO will electronically send a copy of or link to this Report to every party included on the Secretary's official service list in Docket Nos. ER08-1281-000 and ER09-198-000, to the official representative of each of its Customers, to each participant on its stakeholder committees, to the New York Public Service Commission, and to the electric utility regulatory agencies of New Jersey and Pennsylvania. In addition, the complete filing will be posted on the NYISO's website at www.nyiso.com. The NYISO will also make a paper copy available to any interested party that requests one. To the extent necessary, the NYISO requests waiver of the requirements of the Commission's Regulations to permit it to provide service in this manner.

## X. Conclusion

The NYISO respectfully requests that the Commission accept this Report as satisfying the requirements set forth in the Commission's July 16 Order and Order Granting Clarification.

Respectfully submitted,

/s/ *Alex M. Schnell*

Rana Mukerji, Vice President of Market Structures
Robert E. Fernandez, General Counsel
Robert Pike, Director of Market Design
Alex M. Schnell
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, NY 12144

January 12, 2010

## CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service lists compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Rules of Practice and Procedure, 18 C.F.R. § 385.2010.

Dated at Rensselaer, New York this 12th day of January, 2010.

*/s/ Alex M. Schnell*

Alex M. Schnell
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, New York 12144
518-356-8707