2017 Project Candidates

Product and Project Management

6/~~3~~24/2016

This document represents potential 2017 project candidates identified through (1) the State of the Market Report; (2) internal discussions within the NYISO; and (3) discussions with Market Participants in the stakeholder process. These project candidates and their corresponding descriptions reflect information known about each of the project candidates as of the date of this document.

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Business Intelligence Products

Enterprise Information Management - Data Integration Phase III [Continuing]

The Enterprise Information Management initiative is a multi-year strategic initiative focused on bringing together process, design and technology to satisfy market and operations information needs at NYISO. This phase of the project will continue the migration of the Decision Support System (DSS) system data processes to new data integration technology which is intended to reduce support issues and improve maintainability.

Stakeholder Services Suite Phase 2

Currently, customer contact information is being maintained in multiple systems at NYISO resulting in inefficiencies and creating the potential for inconsistent or outdated data. The MS-CRM software in use by the NYISO is not currently integrated with these other NYISO systems. This project will integrate MS-CRM with other NYISO systems to ensure that customer contact data is consistent across multiple platforms. This project will also implement additional features within MS-CRM for use by NYISO Stakeholder Services which is currently not being leveraged.

NAESB PKI Phase 2 [Mandatory]

The first phase of the NAESB Public Key Infrastructure (PKI) project served to prepare infrastructure and applications to accept NAESB compliant certificates and kick off the 10-month transition period. Phase 2 will continue to monitor the transition period while finishing up additional internal efforts to finalize the cutover to accepting only NAESB compliant certificates. This is a continuation of the 2016 NAESB Public Key Infrastructure project.

Key Topics Tracking for Public Website

This project would provide enhancements to the Key Topics page on the public website that is anticipated to be available in the second half of 2016. The Key topics page allows interested parties the ability to track initiatives across the stakeholder process and link to relevant documents without searching through numerous committee web pages.

Public Website Refresh

The NYISO's current public website www.nyiso.com is in need of a redesign. A project in 2015 allowed the NYISO to redesign and refresh the "About NYISO" section of the website. This project will include a contemporary design that will allow for improved organization, structure, and functionality of the remaining sections of the website. The redesign will enhance the user experience, enable improved access from mobile devices, and improve overall design and utility of the site.

Public Website Calendar

The current committee calendar on www.nyiso.com will be updated to newer technology to enable enhanced features and improved capabilities. The upgrade will allow for better user interaction, including improved access via mobile devices. The project will also evaluate integration with personal calendars and will evaluate methods used to notify stakeholders of calendar changes.

Mobile Applications

The NYISO will add mobile applications for providing data and services to market participants, stakeholders, and the general public. This project will target specific content, data, and processes that could be enhanced by accessibility via mobile devices.

eTariff Webviewer Enhancements

The eTariff viewer on the NYISO public website is an application built and hosted by an external party which has provided NYISO the ability to meet FERC requirements of filing tariff updates electronically. This project would enhance the user interface of the eTariff Webviewer to make it simpler to navigate the application and make it easier to select and display the documents stored in the eTariff system.

Secure Communications

In the course of normal business operation, the NYISO is required to email or fax confidential or sensitive financial, legal and other information on the behalf of our Stakeholders and Market Participants to Financial Institutions and other third-parties. The use of less secure electronic communications presents an inherent security risk to the NYISO and its Stakeholders. This project would provide enhanced methods, security and encryption for sending and receiving communications to parties outside of the NYISO.

Capacity Market Products

ICAP AMS Redesign & Test Improvements Phase 1

ICAP AMS is a NYISO application which supports a $3B annual Capacity Market. Developed in house and launched in 2005, ICAP AMS is using multiple aging technologies. The application was built in a rapid succession of numerous market design projects under strict and aggressive implementation timelines continually adding to its complexity. Built by over 20 different developers with varying levels of expertise, and growing, the application is now at the point where it needs to be re-written and optimized in order to support future requirements. It has reached the point where incremental changes will not suffice. This project proposes to re-write the application over multiple phases to improve end-user experience (MPs, MMA, and IMO), increase code quality and maintainability, automate and streamline testing.

RMR Cost Recovery Phase II [Mandatory]

In order to comply with FERCs mandate to have the ability to provide RMR contracts, software updates must be made to multiple NYISO systems which incorporates Bid to Bill, ICAP Reference System ("IRS"), DSS and Registration.

GADS Reporting

To facilitate GADS submittals, to reduce the risk of data issues in relation to GADS submittals, to facilitate EFORd calculations for the capability auctions, and to reduce the time to identify inaccurate reporting and the issuance of penalties, it is imperative that the current process for reviewing GADS data submittal be automated as much as possible.

Modifications to GADS Reporting Software for IIFO

Modify existing GADS Reporting Software allow for reporting of new outage states and modify existing calculations to account for outage states and rules surrounding resources in outages.

Automate ICAP Import Rights

Streamline and automate the process for obtaining ICAP import rights which presently requires the gathering and processing of MP time-stamped faxes, and manually tracking MP requests for import MWs and return of allocated rights. Eliminate the fax process and many of the manual processes used to calculate import headroom, interface availability, and interface limits.

Demand Curve Reset [Mandatory]

ConductSupport FERC filing needs, prepare for first Capacity Auction with new Demand Curve parameters, and conduct lessons learned efforts encompassingwith stakeholders that encompasses topics that may need further consideration prior to the annual update to determine the ICAP Demand Curves for the 2018/2019 Capability Year and/or the next DCR to be undertaken.

Demand Curve Annual Updates [Mandatory]

Work with IT and the ICAP Demand Curve reset (DCR) independent consultant to develop, test, and validate automated software tools to implement the DCR annual update process for the capability years beginning May 2018 and beyond.

Elimination of Capacity Zones (Localities) (SOM) [Continuing]

This is a 2016 project commitment that continues the NYISO and stakeholder efforts to further evaluate whether a mechanism for zone elimination is necessary, whether such rules should be married together with enhancements to the current capacity zone creation rules are desirable, and to further develop the market concepts and tariff rules that may allow for the elimination of capacity zones, enhancements to the zone creation rules and/or achievement of price convergence.

Alternative Methods for Determining LCRs (SOM)

This project is a carryover from the 2016 effort to identify alternative methods for calculating the Locational Minimum Installed Capacity Requirements (LCRs), and would seek to develop automated tools that would determine the LCR combinations that minimize total NYCA capacity cost while maintaining minimum reliability criteria in NYCA and each of the Localities. This project would implement a robust methodology for assessing LCR requirements among all Localities when a new zone is created, and ensure that capacity costs are appropriately allocated across the benefitting LSEs.

Incremental Enhancement to BSM Forecasts of ICAP Prices (SOM)

The Part A and Part B Test buyer-side mitigation (BSM) exemption tests include energy and capacity (ICAP) forecasted market revenues that are dependent on the generating units that are modeled as in-service. Current revenue forecast inclusion rules for generating units may model units that have exited the market and are unlikely to return as in-service, while other projects from completed Class Years are modeled as in-service even when project progress suggests it is unlikely they will be. This project is a carryover of efforts in 2015 and 2016 that proposed to revise the forecast inclusion rules to achieve an enhanced forecast.

Performance Assurance

The NYISO's 2016 Project Plan calls for an evaluation of whether the Performance Assurance provisions implemented in the Energy Market are providing sufficient incentives to meet performance objectives. If not, the NYISO will study various market design changes that may be necessary in the Energy and/or Capacity Markets to provide additional incentives for generation to be available to reliably meet the real-time needs of the NYCA, especially during days where there is a high risk for a reduction in real-time resource availability due to factors such as interchange and fuel supply uncertainty.

Incremental External CRIS Rights

This project is a continuation of the market design discussions conducted in 2015 that evaluated the market design concepts available for allowing Market Participant-funded

transmission upgrades that increase transfer capacity at an external interface to obtain External CRIS Rights. This project would involve development of a market design to allow External CRIS Rights to be awarded to an entity funding such transmission projects.

Capacity Transfer Rights for Internal Transmission Upgrades (SOM)

Create a dynamic and efficient framework for reflecting locational planning requirements in the capacity market to better enable the market to provide locational signals in the future, by granting internal capacity deliverability rights for AC Transmission between zones when AC transmission is upgraded into a local area.

BSM to Address Other Price Suppression Actions (SOM)

Adopt offer floor mitigation measures to address uneconomic retention outside Southeast New York and evaluate rules to address uneconomic transmission investment.

Treatment of Capacity Exports from Localities (SOM)

Modify the capacity market and planning process to better account for capacity that is exported to neighboring Control Areas from Localities that would affect only the NYCA (ROS) capacity prices. Given the direct nexus between this proposed project and the LCR effort, coordination of this project with the efforts that would be undertaken in the Alternative Method for Determining LCRs project remain necessary.

Economically Allocate Import Rights

The Import Rights project would develop a market construct for awarding Import Rights. Currently the Import Rights are allocated to the interties with neighboring regions pro-rata tie capability vs. simultaneous import quantities such that LOLE of 0.1 remains. This static determination may result in unused Import Rights on ties where there is little to no market use; and exhausting Import Rights on ties where there is much market demand. In addition, Import Rights that are allocated to the interties are currently obtained by Market Participants on a first come, first served basis. This project may also evaluate alternative mechanisms to award Import Rights to Market Participants. One such idea would be to administer an auction mechanism to award the Import Rights.

Software Modifications Related to HQ Cedars Interface

Software implementation allowing capacity imports to the NYCA over the HQ Cedars interface. This is related to the market design project "Incremental External CRIS Rights."

Software Modifications for Exports from Localities

This project is for software implementation of a set of rules, if developed (see project above for SOM 8) that account for export transactions when settling the NYCA (ROS) capacity prices.

Demand Response

Business Objects Enhancements for DRIS Data

The NYISO Demand Response Operations (DRO) group uses the DR Universe in Business Objects to perform several routine analysis functions related to the administration of the Demand Response programs. This project will expand the data available to DRO, and the reporting capabilities for Demand Response data. DRO seeks to add data related to the Reporting Universe for DR including the following: kW values for the Average Coincident Load (ACL); kw values for the Verified ACL applicable to Provisional and Incremental Special Case Resources; and data required to calculate potential shortfalls and change of status determinations.

Distributed Energy Resource Program Design [Continuing]

The NYISO is currently developing a Distributed Energy Resource (DER) Roadmap concept paper that will discuss the manner in which ~~DERs~~demand response and distributed resources that are distribution and/or customer connected may be incorporated into the NYISO's wholesale markets. This project will continue to develop the vision outlined in that concept paper. NYISO will begin the process of enhancing its market rules for ~~distributed energy resources~~ DERs to participate in NYISO's capacity, ancillary services, and Day-Ahead and Real Time energy markets, as well as evaluate potential modifications to its existing Demand Response programs in order to enable this effort.

This project will have many facets that ultimately support New York's REV goals and compliance with FERC Orders 719 and 745, while simplifying the product offerings for demand response and distributed resources.

The NYISO envisions the following resource types to be considered DERs:
- Load-only resources – those end users that may be able to modulate their energy usage strictly through load curtailment measures;
- Load with Generation – those end users capable of dispatching behind-the-meter generation resources and/or load curtailment to reduce their demand from the grid;
- Load with Storage – those end users capable of calling on behind-the-meter storage resources and/or load curtailment to modulate their demand for energy from the grid;
- Load with Generation and Storage – those end users who can call upon a combination of behind-the-meter generation, storage and/or load curtailment to adjust their demand; and
- Small Generation on Distribution System – resources that are linked to a load or load aggregation that is connected off the same substation.

This process will require an examination of DER performance obligations, metering and telemetry requirements, measurement and verification of baselines and performance,

modeling, and an understanding of how to balance the simultaneous participation of DERs in retails/distribution-level programs as well as the NYISO's wholesale program.

NYISO Pilot Framework

In conjunction with the Distributed Energy Resource Program Market Design, the NYISO will explore the use of Pilot Programs to test new energy technologies. This project will create a framework that will allow developers of new or emergent technologies and the NYISO to gain knowledge about the technology's capabilities and uses and support REV demonstration efforts. This will ultimately allow the NYISO to develop market rules that appropriately incorporate technology capabilities and meet grid needs. This pilot framework concept does not contemplate paying resources while the resource is within the pilot phase.

Granular Pricing & Market Price Delivery

This project will evaluate publishing additional Nodal load prices to assist REV development opportunities and DER participation. The NYISO intends to explore and recommend additional locational attributes and data delivery technologies (in addition to csv files posted to www.nyiso.com) that establish the infrastructure and application interfaces to allow for third party access to and utilization of NYISO calculated nodal prices.

Meter Data Policy

The NYISO will work with stakeholders, the NYPSC, and Meter Data Providers to develop a set of policies and rules to clearly establish the NYISO's role in defining, collecting, and validating resource meter data with the appropriate level of precision and accuracy.

State-of-Charge Management for Energy Storage

This project will review the current state-of-charge management tools used by the NYISO and determine whether those tools meet current needs, evaluate new state-of-charge management needs for energy storage resources ~~that~~when they are only ~~provide~~providing regulation service, and develop tools for managing those resources' physical capabilities.

Limited Resource Performance Obligations: Evaluate Minimum Performance Obligation for Capacity Resources

This project will evaluate whether current minimum performance requirements should be increased from the current minimum of 4 hours and, if appropriate, develop the market rules to revise the performance obligation requirements of Special Case Resources (SCRs) and Energy Limited Resources (ELRs) and to define the requirements for any potential DER resources that sell into NYISO's Capacity market. Changes to the performance calculations of SCRs will also be required to align with the change to the performance obligation.

Energy Market Products

ConEd/PSEG Wheel (SOM) [Continuing]

NYISO has been working with PJM and ConEdison to develop alternative designs for modeling the ABC and JK interfaces after the wheel expires on May 1, 2017. This project would model these lines/interfaces as part of the CTS process with PJM or by incorporating these lines into the M2M process with PJM.

Outage Analysis Tool

In order to support the large volume of outage requests affecting both the bulk and underlying system, we are looking for an automated outage analysis tool capable of analyzing transmission outages for all 24 hours of a given day based on a selected load forecast and generation profile. The tool should compare the results of a base case to the results of an outage case so informed decisions can be made based on outage impacts. Similar systems have been developed in other ISO's using PowerGEM, TARA, and AREVA to name a few.

Fuel Assurance – Constrained Fuel Supply Bidding (SOM)

This project will continue work on developing implementation specifications for a day-ahead inter-temporal bidding design for a single or group of resources. This project will encompass either moving forward with the Total Energy Curve (MWh constraint) design implementation (use cases, or detailed implementation specifications) and/or developing requirements to pursue implementation of the more complex Fuel Cost and Efficiency Curve (fuel constraint) design currently being vetted through the Stakeholder process.

These designs would allow generators to submit bids subject to an inter-temporal constraint in the day-ahead market. This concept was a State of the Market recommendation in both 2013 and 2014. The premise behind this is that generators face significant fuel supply constraints that can be difficult or impossible to reflect efficiently in day-ahead offers. For example, hourly OFOs may require a generator to schedule a specific quantity of gas in each hour of a 24-hour period even though this may not match its day-ahead schedule. Not only does this subject the generator to significant financial risks when it is scheduled in the day-ahead market, but it also raises costs for consumers, since the generator is likely to respond by reflecting these costs in other offer parameters or by reducing its availability. Hence, allowing generators to submit offers that are scheduled subject to an inter-temporal constraint would reduce the OFO-based risks of being available.

In addition, when gas prices are very high, oil-fired and dual-fueled generators can be limited by air permit restrictions and/or by low oil inventories. It would be beneficial for the generator to be able to conserve its limited oil-fired generation for periods when it is most valuable. Currently, generators reflect these quantity limitations by raising offer prices, but this is an imprecise method that requires generators to guess what offer price levels are needed to

achieve the targeted level of fuel consumption over the day. This leads to both foregone opportunities and unnecessary depletion of limited oil inventories. Hence, allowing generators to submit offers in the day-ahead market that reflect quantity limitations over the day would allow such generators to be scheduled more efficiently when they are subject to fuel or other production limitations. This capability would also be beneficial at other times of year for hydro-electric and other generators that also have significant energy limitations.

ACD Dataset Reporting

Incorporate calculations for ACD adjustments into SUEDE data so ambient dependent resources have adjusted DMNC values built into current SUEDE reports for Physical Withholding and ICAP Underbidding.

Integration of OFO Status into SUEDE

The import and reading of OFO emails such that SUEDE data sets can include a column for each generator hour that indicates OFO status. Based on OFO status, resource gas portfolio, and resource DAM/HAM schedules, logic would automatically indicate if resource had competitive justification for non-offers (physical withholding). OFO status indicator would also clue in MPA staff on necessary additional research steps for Economic Withholding evaluation.

Energy Storage Integration & Optimization

With the advancement of energy storage technology, the NYISO will look for ways to improve market integration and optimization of ~~storage devices.~~ larger storage resources whose primary objective is to participate in the wholesale market. This project would involve working through the stakeholder process to look at ways to improve upon existing programs, or create a new program that would allow for better optimization of energy storage within the wholesale markets.

The NYISO is separately reviewing pursuing integration of small storage resources or sets of small storage resources within its DER Roadmap efforts.

Quarterly Congestion Reporting

The NYISO currently posts report on historical congestion on a quarterly basis. This is performed by the System Resource & Planning and Technology Development groups in a manual, labor-intensive process. A project deployed in 2016, "Congestion Reporting with Offline SCUC" automated the data generation portion of the process. This project will involve the automation of the data comparisons, and associated reporting portions of the process that are still manual processes. This project aims to automate a large portion of these remaining manual processes.

Linked Virtual Buy-Sell Transactions [Future]

This project is designed to increase the price convergence between the Day-Ahead and Real-Time market prices by allowing a Market Participant to hedge a deviation between Day-Ahead and Real-Time congestion prices between two zones.

Targeted Virtual Trading [Future]

Day Ahead and Real Time price convergence is an essential measure of market efficiency. Prices in the DA reflect the anticipated price in RT, plus a risk premium. The existence of many buyers and sellers of energy at the zonal level allow the collective intelligence of traders, LSEs, and generators to settle on a DA LBMP that, on average, approximates the RT LBMP.

Prices typically converge well at the zonal level within the NYISO markets; however, Potomac Economics has reported on divergence between DA and RT prices at the bus level in each SOM from 2006 to 2013. This divergence is tied to having few buyers and sellers of Energy at the bus level; generators receive a bus level price and loads pay a zonal price based on a weighted average of the bus level price, but traders are unable to take positions at these buses that will influence the DA commitment. Increasing the number of buyers and sellers at targeted virtual trading buses will increase price convergence at the sub-zonal level, ensuring zonal LBMPs accurately reflect the value of energy.

Targeted Virtual Trading (TVT) will enhance the NYISO's virtual trading offering to Market Participants, providing for better price convergence, increased liquidity, and more accurate unit commitment among other benefits.

Long Island PAR Optimization & Financial Rights (SOM)

The Long Island Phase Angle Regulators at Lake Success and Valley Stream, collectively the "LI PARs", are not currently optimized by the NYISO's market software and instead operated to facilitate a long-standing contract to deliver power to meet system reliability in NYC. This causes power to flow in an inefficient direction for the majority of the time in the DA (2013 and 2014 SOM). The market software/ processes would require modification to optimize the LI PARs and minimize total production cost by ensuring power flows in the economic direction. Since more efficient operation of the LI PARs would benefit one party financially at the expense of the other, it is also reasonable to create a financial settlement mechanism to compensate the party that would be giving up some of the benefits from the current operation.

Hybrid GT Pricing Improvements (SOM) [Continuing]

Potomac Economics has recommended the NYISO pursue Hybrid GT pricing improvements in a number of recent State of Market (SOM) reports. The NYISO will consider modification of the Hybrid GT logic in Ranger to allow GTs to set price in real-time in more instances. Modification of the existing logic is intended to provide for more accurate price signals and performance incentives, as well as better align pricing outcomes with reliability needs and operator actions.

RTC-RTD Forward Horizon Coordination Improvements (SOM)

Modeling inconsistencies between RTC and RTD look-ahead evaluations as they evaluate external transactions and the start-up/shut-down of gas turbines, result in unforeseen ramp constraints and undermine the accuracy of prices forecasted by RTC. These inconsistencies may also contribute to transient shortage conditions and unnecessary price volatility. Review and adjustment of the look-ahead RTC and RTD evaluations should be investigated to alleviate

unnecessary ramp constraints, reduce unnecessary price volatility, and could also lead to better SCUC-RTC-RTD price convergence.

Enhanced PAR Modeling (SOM) [Future]

Variation in loop flows and in flows across certain PAR-controlled lines were among the leading causes of transient price spikes in 2014 (2014 SOM). Discrepancies between modeled and actual loop flows, and modeled and actual flows across PAR-controlled lines lead to transient shortages where generation must be ramped up to account for scheduling discrepancies and flexible generators cannot ramp quickly enough to compensate for changes. This subsequently leads to spikes in shadow costs or LBMPs. Mechanisms incorporated into the market solution may help to alleviate these discrepancies between modeled and actual loop flows and flows on PAR-controlled lines. Adjusting the last telemetered flows on fixed scheduled PARs and using these adjusted values as inputs to RTC and RTD to account for variations in generation, load, interchange, and other PARs that are located in the NYISO footprint can more accurately model actual PAR flows realized. In addition, developing a mechanism to forecast deviations between telemetered and actual loop flows and telemetered and actual fixed PAR flows and incorporating these adjustments within RTC and RTD can more accurately reflect real-time system conditions, resulting in more efficient scheduling and prices and reducing unnecessary price spikes. This initiative also involves evaluating improvements to the modeling of day-ahead loop flows and flows on PAR controlled lines.

Review of RACT Compliance Plans (SOM)

NOx bubble constraints were established by the NYISO in the LRR pass of SCUC for three generator portfolios in New York City based on the compliance plans they filed with the Department of Environmental Conservation ("DEC"). Currently these portfolios use the "System Averaging" compliance option which requires the operation of a steam turbine unit in order to reduce the overall NOx emission rate from a portfolio containing higher-emitting gas turbine units. Owners of generation in NOx bubbles likely have additional RACT compliance options, which may result in lower emissions at lower cost. Since commitments of steam turbines are necessary for the associated gas turbines to operate (or even provide non-spinning reserves), they are categorized as for local reliability and the resulting out-of-market costs are uplifted to the market. If generators select lower cost options to comply with RACT standards, uplift may be reduced, or these units may be committed economically instead of out of market.

Additionally, the MMU assessed that it is likely that NOx bubble commitments had the effect of increasing rather than decreasing overall NOx emissions across electric generating units in New York City. This is because the commitment of steam turbine units typically crowds-out generation from new fuel efficient generation with selective catalytic reduction capability, and it is rare that these commitments would reduce production from older gas turbines as they were intended. According to the 2014 SOM, steam units emit approximately 13 times more NOx per MWh than the newer generators with emission-reduction equipment. To reduce uplift and ensure more economic unit commitments, the NYISO proposes to create a review process for RACT compliance plans where the NYISO will work with generation owners to ensure their RACT compliance plans use the most economic compliance option available.

Fuel Limited Reserves (SOM) [Future]

Hourly Operational Flow Orders ("OFOs") are often declared on the days when gas supply is very tight. During hourly OFOs, many generators that are reliant on natural gas may be unable to start-up or ramp-up if deployed in response to a sudden large contingency.   Even if generators are authorized to take additional gas on such days, pipeline operators may have difficulty maintaining sufficient pressure to allow a large amount of generation to suddenly respond to a reserve pick-up. According to the 2014 State of the Market Report, analysis suggested that real-time reserve clearing prices (and LBMPs) may have been understated during periods with hourly OFOs – reserve clearing prices did not always reflect the limited availability of operating reserves or the costs of the supplemental commitments made to maintain reserves. Out-of-market commitments often result in uplift charges and depressed real-time clearing prices for energy and ancillary services which could undermine incentives to perform reliably during tight winter operating conditions.   Consequently, the energy market may not provide adequate incentives for generators to make reserve capacity available by maintaining oil inventories and equipment necessary to operate on oil. To address these concerns, the NYISO is proposing to implement procedures to help identify unloaded capacity that is not capable of responding reliably in the event of a reserve pick-up. This may require generators to provide necessary information in real-time and/or for pipeline operators to indicate when the pipeline has limited capability to support a large pick-up in gas-fired generation over a ten -minute period.

5-Minute Transaction Scheduling

In 2011, the NYISO activated 15 minute transaction scheduling with Hydro Quebec followed by PJM and ISONE. This project would look to continue to improve real-time interchange scheduling processes by allowing economic scheduling of interchange across controllable interties via the 5 minute Real-Time Dispatch ('RTD'). This 5-minute scheduling concept was contemplated when Hydro Quebec and the NYISO implemented 15-minute scheduling. This could provide additional sources of Operating Reserves and Regulation Service.

15-Minute Transaction Scheduling - HQ Cedars [Future]

As part of the Broader Regional Market Initiatives the NYISO activated 15-minute transaction scheduling with Hydro Quebec at the Chateauguay interface followed by PJM at all NY-PJM interfaces. This project would look to continue to improve real-time interchange scheduling flexibility by implementing 15-minute transaction scheduling at the HQ Dennison-Cedars intertie.

15-Minute Transaction Scheduling – IESO [Future]

As part of the Broader Regional Market Initiatives the NYISO activated 15-minute transaction scheduling with Hydro Quebec at the Chateauguay interface followed by PJM at all NY-PJM interfaces. This project would look to continue to improve real-time interchange scheduling processes by implementing 15 minute transaction scheduling at the IESO Bruce intertie.

Model 100+kV Transmission Constraints (SOM)

Market incentives for investment in resources on the 115kV system in up-state New York are inadequate partly because these facilities are not reflected in the NYISO's energy and ancillary services markets. Currently, these constraints are managed through out-of-market actions, which has contributed to the need for cost-of-service contracts to keep older capacity in service. Since these 115kV constraints are not reflected in the market scheduling process, real-time dispatch and day-ahead commitment decisions are sometimes inefficient. This project would investigate the feasibility of the NYISO managing the up-state 115kV transmission constraints in the day-ahead and real-time markets.

Transmission as Reserves (SOM) [Future]

In some cases, the reserve requirement for a local area can be met more efficiently by importing reserves (i.e., reducing flows into the area and treating the unused capability as reserves) rather than scheduling reserves on internal generation. This project will modify the market software to optimize the upper limit on the amount of reserves that can be held on Long Island and also optimize the amount of reserves that should be held in SENY considering that the need can also be met by reducing the pre-contingent flows over the UPNY-SENY interface.

Graduated Transmission Demand Curves (SOM)

Currently, the NYISO has a process whereby some transmission constraints that cannot be resolved or could only be solved at an extraordinarily high cost are "relaxed." This project will document the current process and consider replacing it with a process where transmission constraint violations are resolved with graduated transmission demand curves that can vary according to the importance, severity, and/or duration of the transmission constraint violation.

Improve DAM GT Scheduling (SOM) [Future]

Several key assumptions in the day-ahead market optimization have the effect of leading some uneconomic gas turbines to be scheduled when they are not economic. Although the NYISO is considering software changes that would address some of the underlying causes, not all of the underlying causes will be addressed. This project further modifies key assumptions in the day-ahead market commitment logic to avoid scheduling uneconomic gas turbines.

Scarcity Pricing Tariff Revision

Recently the NYTOs shared a concern with us regarding the Comprehensive Scarcity Pricing logic approved by stakeholders in 2015. Specifically, the concern relates to the NYCA 30-minute reserve demand curve used during real-time intervals in which the NYISO has activated EDRP resources and/or SCRs in a subset of all Load Zones. The NYISO will further discuss the concern with stakeholders and pursue a resolution.

Offer Cap Enhancements for FERC

Differences in offer caps between regions may interfere with economic and reliability driven interchanges scheduling. On January 21st, 2016, FERC issued a NOPR under which resources

would be allowed to submit bids beyond the existing $1,000 bid cap subject to cost verification. The NYISO filed comments in response to the NOPR on April 4, 2016 generally supporting a soft cap of $1,000/MWh, while advising that a consistent hard cap among regions is needed to address market seams concerns. This project is in preparation of potential changes to offer cap rules due to FERC action.

Ontario Pricing

PJM and MISO have made changes to their pricing for interchange that sources or sinks within Ontario. These changes from the RTOs were designed to capture the performance of the Ontario – Michigan PARs when marginal energy prices are established. This project will look to determine whether the NYISO needs to make conforming changes, and implement those changes if necessary.

Reinstitute Import Guarantees

Several stakeholders have requested that the NYISO reinstitute Import Curtailment Guarantees and Bid Production Cost Guarantees. This project will review that request and work with all stakeholders on facilitating a supportable approach forward.

The elimination of guarantees in April 2014 increased the risk of importing energy in the NYISO through the Real-Time Market. Currently, the price risk inherent to those transactions, triggered by inconsistencies between the RTC and RTD applications, is entirely supported by Market Participants involved in such transactions (i.e. importers). In some cases, importers are scheduled with RTC at a positive shadow price, but are ultimately settled at a lower (and sometimes negative) RTD price. As a result of those inconsistencies, importers will mitigate exposure to such risk by reducing competitive offers of energy into the NYISO Real-Time Market. Both the reduction in liquidity at some interties and poor realization of cost savings as a result of CTS scheduling has been repeatedly observed by the NYISO, most recently in its 2015 State of the Market Report.

This project will review the costs and benefits of re-implementing the aforementioned Guarantees at the interties until such time that the RTC-RTD convergence problems can be fully resolved and work with all stakeholders on designing a supportable approach forward.

Eliminate Fees for CTS Transactions with PJM (SOM)

The efficiency benefits of the CTS process with PJM have generally fallen well short of expectations since it was implemented in the fourth quarter of 2014. We have observed far greater utilization of CTS bidding at the ISO-NE interface since it was implemented in the fourth quarter of 2015. The lower utilization of the CTS with PJM can be attributed to the relatively large fees that are charged to transactions between NYISO and PJM, while fees were eliminated years ago between ISO-NE and NYISO. It is unlikely that CTS with PJM will function effectively as long as transaction fees and uplift charges are large relative to the expected value of spreads between markets. Hence, we recommend eliminating transaction fees and uplift charges between the PJM and NYISO.

Changes to Selkirk Market Modeling

Selkirk Cogeneration is a thermally integrated combined cycle facility that delivers power into two different interconnections and is modeled as two distinct PTIDs (Selkirk I and Selkirk II) in the NYISO markets. Selkirk's preferred option is to offer the two PTIDs with costs that reflect the most efficient operating mode of the combined cycle facility, which is when all GTs are running. However, there are occasions where only one PTID is committed without the other, causing the committed PTID to operate at a higher cost than was reflected in the bid and that may not be fully recovered through market prices. Moreover, in instances where the GT connected to the Selkirk 1 bus it still delivers generation at the Selkirk II bus because the steam turbine is connected to Selkirk II. Selkirk is requesting an enhancement to the Energy Market such that Selkirk I will not be committed without Selkirk II and vice versa. The project will allow two PTIDs to be permanently linked in a manner where all PTIDs will be committed or none of them will be committed. It will also address any changes to BPCG/DAMAP that would be necessary under a linked commitment model.

Fractional MW Load Bidding

Load Bids and Energy Transactions can only be entered as whole MW. This does not recognize that suppliers may serve customers in fractional units, and must therefore forecast load in fractional units. Whole MW bidding results in inaccurate forecasted load bid and potentially increases Day-ahead and Real-time risk because it does not reflect the fractional-unit nature of most customer load. Moreover, this discrepancy is potentially additive as the number of customers served by a supplier increases. Increased supplier risk corresponds with increased prices to customers for that risk.

Startup Cost Compensation

Today, all generators committed in the day ahead market are paid based on their day ahead startup offer. In real-time, short notice resources like simple combustion turbines with day ahead commitments could be cycled off and replaced with more efficient, less costly energy. Today's market construct does not allow for short notice resources with day ahead commitments to be re-evaluated for commitment in real-time. Likewise, if short notice resources with day ahead commitment were re-evaluated, startup and minimum generation costs would need to be updatable to ensure that the most efficient resources were selected in real-time. Additionally, settlement of day ahead and real-time startup costs would need to be considered to ensure the market properly valued the service it was receiving. This project will investigate all of the aspects above with stakeholder input and feedback to determine whether there needs to be a market construct change.

Enterprise Products

Storage Infrastructure Redesign Phase III [Continuing]

Many of the NYISO's existing storage technologies have reached, or will soon reach, the end of their lifecycle. This results in significant increases in support and maintenance costs and higher rates of component failures. This project is the final phase of a multi-year initiative to replace an aging storage infrastructure with new systems designed to leverage technology advances for improved performance and reliability with a reduced storage footprint and total cost of ownership. These performance improvements are necessary to avoid tariff violations and achieve required service levels.

Database Platform Upgrades Phase II

This is the final phase of a multi-year effort to upgrade the NYISO's database systems and implement changes to improve the overall performance of critical databases. This technology lifecycle project is necessary to ensure the ongoing availability of security patches and vendor support for critical systems.

Telephony System Upgrade [Continuing]

This is a multi-year project intended to reduce the total cost of ownership of telephony systems, improve network resiliency and redundancy, utilize best-in-class technology and maintain or enhance current levels of service and support. This phase will implement vendor technology solutions selected for voice / data equipment and services, network connectivity and unified communications.

Application Platform Upgrade Phase IV [Continuing]

This is a continuation of a multi-year effort to replace aging server infrastructure and migrate to a new application platform standard. This phase includes hardware/operating system migrations and middleware upgrades.

Identity and Access Management (IAM) - 2017

This is a multi-year project to improve identity and access management (IAM) controls for cyber systems and physical facilities. The IAM 2017 project builds upon the completed deliverables from earlier IAM project phases. This phase seeks to further extend automated provisioning capabilities and implement infrastructure upgrades for enhanced security and improved system availability.

Marketplace and Webforms Technology Upgrade

This project seeks to perform technology upgrades in Marketplace and Webforms to improve security, improve testability, and optimize and enhance the ability of Market Participants to exchange information.

Software AG Upgrade

This effort will build upon and enhance the Ranger Messaging Integration Platform to handle the more stringent performance and availability requirements of the reliability applications. Enhancements to the platform include improving the integration of existing market applications, as well as ensuring the platform resides on a vendor-supported version that is capable of handling future market and reliability application integration needs.

Backup Enhancements

The backup system is critical to NYISO's business continuity program and necessary for disaster recovery scenarios; loss of equipment, facilities, or malicious activity. The objective for this project is to improve the NYISO's database recovery efforts, speed up database refresh efforts, and reduce storage costs on the enterprise storage system.

Application Testing Improvements

Production releases at NYISO introduce increased complexity in our development and testing efforts and require manual testing. Test automation is an effective method to gain efficiencies while increasing testing effectiveness. This project seeks to automate test scripts and to provide significant test automation for multiple NYISO applications.

Enterprise Job Scheduling Upgrade

Control-M is NYISO's enterprise scheduling software which is responsible for automating the execution of system processes necessary to support the NYISO business.   This project seeks to upgrade the Control M software to the latest version to ensure on-going availability of security patches and vendor support for this critical system.

Finance Products

North Subzone Redistricting [Continuing]

In 2008 NYPA and National Grid requested new sub-zonal boundaries in the North Zone in order to reduce Unaccounted For Energy (UFE). NYISO worked with NYPA and National Grid to provide a solution, which was effective 12/1/2008. The current solution is a manual process administered by NYPA and National Grid. In 2015, the NYISO completed a Market Design Concept Proposal (MDCP), which identified a solution that would allow for changing the boundaries of subzones within zones systematically. The 2016 budget included a project for implementation of the MDCP with a commitment of completing high level requirements. This project will continue the work identified by the Market Design Concept.

Rate Schedule 1 Technology Automation [Continuing]

Rate Schedule 1 Technology Enhancements will automate the manual processing and manual adjustments of non-physicals, the TCC, and Virtual Markets for the NYISO Annual Budget and FERC Fee components of RS1. This project would provide automation of Rate Schedule 1 to improve efficiency and reduce risk associated with manual processing. This project is a continuation of the 2016 Rate Schedule 1 Technology Automation project.

Day Ahead Margin Assurance Payment (DAMAP) Enhancements [Continuing]

This project will refine certain bid submittal and validation rules, as well as DAMAP rules to ensure that DAMAP eligibility in both the Reserve and Regulation markets is evaluated as it was intended in the real-time market. Some of these changes will require tariff revisions.
This project is a continuation of the 2016 Day Ahead Margin Assurance Payment (DAMAP) project.

Settlements Sub Accounts

Market Participants have requested an option for detailed reporting of sub-account level settlements data for those MPs that are a Financially Responsible Party (FRP). The NYISO would provide MPs that are a FRP with transparency of settlement data of their dependent-entities in that FRP relationship. This enhancement will provide MPs with flexibility in reconciling their settlements, increased accuracy in billing and allocating costs to their customers. This functionality would be provided through the Decision Support System (DSS) Settlements system. This is a continuing project from the 2016 budget year.

Transmission Service Charges Rate Update [Continuing]

For each export transaction and wheel-through transaction the NYISO allocates the megawatt hours of the transaction to each Transmission Owner whose transmission system is used in the transfer of the scheduled energy associated with the transaction. The allocation process utilizes a set of Distribution Factors (DFax) determined by the NYISO using an "all lines in-service" case of the NYISO power system model. The resulting DFax are then stored in the NYISO settlement

system to be used as input to the calculation of the allocation. The current processes for settlements and the posting of TSC-related data performs the calculations based on a specific point of injection (generator) and a specific point of withdrawal (External Proxy Bus). This project involves modifications to the current process to provide a better method for updating DFax values and changing the calculation to use a zonal or subzonal proxy point rather than the specific point of injection. This project is a continuation of the 2016 Transmission Service Charges Rate Update project.

Transactions Modifications & Confirmation Tool

The Customer Settlements department requires a tool to be developed that will assist in the validation of external transaction schedules. Customer Settlements staff currently use multiple forms that were originally developed to support the needs of Operations staff.   With modifications to these forms required to implement 15-minute and CTS scheduling protocols to support Operation's departmental needs, these forms no longer provide the means for Customer Settlements staff to efficiently administer their validation process.

Settlement at Sub-hourly Metering - Study

This project would study the impacts to NYISO systems and settlement methodologies of allowing sub-hourly revenue grade metering data (such as 5 minute or 15 minute). Generators, Meter Authorities/ Transmission Owners, and LSE's may potentially need to choose at what level of granularity their metered data would be provided.

CMS/ ConInvoice Data Integration

Finance manages a number of processes to manually update collateral, prepayments and Market Participant transfers and refunds within the Credit Management System (CMS) and the Consolidate Invoice system (Con Invoice). This project would provide an automated solution to link CMS and Con Invoice, eliminating the need for manual data input and ensuring timely and accurate data in both systems.

CMS Projected True-up Exposure Study

In early 2015 the NYISO implemented changes to credit policy to account for significant differences between a Market Participant's initial settlement and four month true up.   The NYISO had determined in certain situations, particularly times of high energy price volatility and demand, the market may have increased true-up exposure due to Market Participants under forecasting its load and other circumstances. Changes to the credit policy were necessary to mitigate market exposure by those Market Participants with true-up exposure. These changes were deployed to the Credit Management System (CMS) in February 2015. This project would perform additional analysis to identify potential areas of improvement to the current projected true-up exposure credit policy. This project is intended to conduct the requested analysis and present the findings.

Expense Reports Automation

This project would automate the process for submitting, approving and processing expense reports for all NYISO employees. An automated user interface would be integrated with the Oracle E-Business Suite Financials and replace the existing form and manual processes that are in use today.

Financial Reporting Tools

The Accounting and Procurement departments are currently limited to the standard reports and a number of custom reports that are available in Oracle E-Business Suite Financials. This project would provide reporting tools in Oracle Financials that will allow the Accounting and Procurement business users to create custom reporting and ad-hoc queries on demand.

Contract Management

The NYISO's Procurement department handles approximately 500 vendor contracts annually, with varying levels of scope and complexity. The current contracting process generally involves multiple departments in the review and negotiation of agreements and related documents, which generates multiple document versions and necessitates several rounds of internal review, comments, and approvals. This project would involve the identification, development, and implementation of a contract management system that provides enhanced and automated process management, workflow, versioning, tracking, approvals, and other controls throughout the entire contract lifecycle.

Operations & Reliability Products

EPG PMU Simulator

This project is to procure a Phasor Simulator for Operator Training Environment from Electric Power Group. This environment will provide synchrophasor hands-on training based on simulations, historic events, and other events specific to the NYISO footprint.

PMU Enhancements

The Smart Grid Investment Grant looked to implement Phasor Measurement Units (PMUs) and Infrastructure components to exchange synchrophasor data collected by the NY based PMUs as well as be able to exchange the collected data with regional neighbors. This effort is to upgrade various components for use in a variety of applications within grid operations units.

Smart Grid Visualization

This project involves continued improvements in the data and analytics available to the operators through Phasor Measurement tools need to be integrated into the larger situational awareness system of the control room for maximum benefit.

TOA Platform Upgrade Phase II [Continuing]

This project continues the efforts of the 2016 project which upgraded the platform the current Sun-Net TOA 10g application runs on. This project will upgrade the current end-of-life software and hardware for the TOA 10g application to the new version of the software titled iTOA. Currently the NYISO is one of the few remaining customers on the dated platform which reduces our ability to implement new functionality and increasing concern of supportability.

EMS/BMS System Upgrade [Continuing]

This is a multi-year project to upgrade both the Energy Management System (EMS) and the Business Management System (BMS) which can also be referred to as the Market Management System (MMS). The EMS encompasses the core reliability functions used by the system operators such as load flow and contingency analysis. The BMS/MMS encompasses the day ahead and real time energy market functionality. This phase will complete the development process by the vendor and internal NYISO development efforts. In addition, the project and begin the Factory Acceptance Testing (FAT) to be performed by the vendor, ABB, and the NYISO.

2017 Reference Level Software Enhancements

This project will address improvements to the documentation of the RLS application as well as several functional enhancements to the RLS software. Some functional enhancements include allowing multiple fuels for a single reference, an IBRT screening report, improve screen refreshes, and create a super approver role.

Gas Balancing Position Reporting

Reference levels used in withholding evaluations to determine conduct and potential impact can be inaccurate as they may not represent the most timely and up to date gas balancing positions. This project would look to move balancing position information into the databases used by MMA and incorporate this data into MMA's tools and reports.

FERC Funded Rerun – Phase 4 [Continuing]

The FERC awarded the NYISO funding to improve the MMA's fundamental analysis capabilities. This funding was used to develop a Market Rerun Tool as well as a Market Sensitivity Analysis tool to aid MMA in their analysis. A project in 2016 was executed to develop the tool software. This project is to test the completed software and deploy to Production in 2017.

SUEDE Front End Toolset

In order to effectively utilize market monitoring data (housed in SUEDE), MPA/MMA staff members need to be able to write and/or manipulate SAS code.

Planning Products

Solar Forecasting Initiatives [Continuing]

In 2016, the NYISO began the Solar Forecasting Initiative to develop the capability to produce forecasts of both grid-connected and behind-the-meter solar PV forecasts in its real-time forecasting models of load. In addition, the project is to bring situational awareness of solar PV in the control room. The goal of the 2016 project was to be code-ready for both these objectives.

The 2017 project is to continue the development of the Solar Forecasting Initiative by making the solar forecasting process operational by the end of Q2 2017, including two-way communication of solar irradiance and solar MW data at sub-hourly intervals (5-minute or 15-minute).

TCC Products

TCC Balance-of-Period (TCC AMS, TCC AVS & CMS) [Continuing]

Market Participants have indicated that a Balance-of-Period (BoP) auction format is a high priority for those participating in the TCC Market. This project would update the TCC Automated Market System (AMS) and TCC Automated Validation System (AVS) to include functionality to support the BoP auction format. The Credit Management System (CMS) would also need to be updated to support the BoP auction format.

The TCC BoP auction format will replace the current single period Monthly TCC Reconfiguration Auctions. Once implemented, MPs would be able to reconfigure their TCCs for the remaining months within the Capability Period and be required to hold collateral for those months remaining in capability period (NYISO currently holds the entire 6 months credit until the last monthly Reconfiguration Auction runs for the Capability Period).

On-Peak/Off-Peak TCCs [Future]

The on-peak/off-peak TCC product is a desired featured requested by Markets Participants who participate in the TCC auctions. The on-peak/off-peak TCCs allow MPs to bid for TCCs that are effective only during on-peak hours, off-peak hours or a combination of both in the TCC auctions. Today TCCs that are awarded are settled across all hours of a day during the time period in which the TCC is active. With the on-peak/ off-peak option, MPs would be able to adjust their portfolios to hedge against congestion costs during on-peak or off-peak periods of a day.