2015 Project Candidates

Product and Project Management

~~9/17/2014~~9/30/2014

This document represents the 2015 project candidates identified through internal discussions with Business Owners and discussions with Market Participants in the stakeholder process. These candidates and their corresponding descriptions reflect information known about each of the project candidates as of the date of this document. If you have any additional questions, please contact the appropriate Product Manager to seek clarification.

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BUSINESS INTELLIGENCE PRODUCTS

NY Generator Attribute Tracking System (GATS) Data Feed

This project is in process with NYSERDA and the PSC. After many years of discussion, legislation was recently passed which is moving this project forward.

NYISO will need to provide feeds of data to a new NYGATS tracking system. The data feeds would be for actual MW data as well as generator attribute information that NYISO has within its systems. There is no request for the NYISO to increase the amount of data NYISO collects. The NYGATS system itself would have other inputs for getting information that NYISO cannot provide.

This data feed will likely replace the NYISO processes for providing data to the PSC Environmental Disclosure labeling programs (EDP) and the NYSERDA Renewable Portfolio Standard (RPS) program, both of which are supported by NYISO today.

OASIS Postings Technology Upgrade Phase 2

This project is a continuation of the 2014 OASIS Posting Technology Upgrade project. The 2015 project goal is to continue to replace TIBCO BW-Business Works technology with Software AG's ESB technology for the posting of files onto NYISO's OASIS site http://mis.nyiso.com. This project will also continue to enhance the IT environment by retiring dated technologies with limited Subject Matter Expert knowledge and create an updated environment that supports key business initiatives

The 2014 project also completed migrating processes responsible for posting 7 (out of 34) reports to the Load Data and Reports and Information areas on OASIS, http://mis.nyiso.com. Phase 2 will continue this effort migrating postings from TIBCO Business works to Software AG's ESB technology from the Load Data and Reports & Information areas as well as including reports in the Pricing Data and Power Grid areas. Currently a total of 27 reports remain to be posted using the outdated TIBCO Business Works technology.

DSS Business Objects Upgrade

This is the completion of the 2014 project to upgrade NYISO's business intelligence platform from SAP Business Objects XI version 3.x to 4.x. Version 3.x is 5 years old and is reaching the end of its support window.

Public Website Renewables Page

The scope of this project is to develop a new page on the NYISO public website where renewable energy data would be displayed showing current activity and trends of renewable energy sources over time. Renewable Energy data for solar, hydro and wind are a few of the sources that could be made available along with imports accounting for the flow of renewable energy from external sources through NYCA – New York Control Area.

Public Website NYISO Budget and Value Proposition Pages

This project would reorganize some of the data on the public website to provide easier access to information related to the NYISO's budget, the budget process, and the value proposition of NYISO markets.

Enterprise Information Management: Data Integration

The Enterprise Information Management initiative is a strategic initiative focused on bringing together process, design and technology to satisfy market and operations information needs at NYISO. This would improve the ability to support required data feeds such as FERC Order 760, NYGATS and DOE EIA 930.

CAPACITY MARKET PRODUCTS

Modify the Pivotal Supplier Test (SOM)

Modify the pivotal supplier test in response to the FERC's compliance mandate in order to prevent a large supplier from circumventing mitigation by selling capacity in the forward auctions.

ICAP AMS Enhancements Phase 2

The AMS software was developed and implemented to simplify and support the AMO business functions. Additional opportunities to automate processes are under consideration for 2015.

DMNC Test Validation Automation

MMA staff manually review Dependent Maximum Net Capability (DMNC) test data submitted by Suppliers and manually validate the unit output reported during the test period and the temperature-correction calculation. The DMNC data submitted is then utilized to determine how much UCAP a suppler may sell in the capacity markets. Errors in the DMNC calculation and misuse of the data (e.g., use of a Winter value for the Summer capability period) can have significant impact on capacity market outcomes. The current process, which is partially performed via SAS does not include a validation of current DMNC values against historic values to detect material changes in the reported values. The proposed project would automate the current DMNC validation process and incorporate the additional validation against historic DMNC values.

Reactive Test Data Collection and Tracking

Suppliers of Voltage Support Service (VSS) are required to perform tests annually to demonstrate their reactive capability. Currently VSS suppliers send those approximately 400 test results to the NYISO electronically on a spreadsheet. Auxiliary Market Operations manually enters 16 data fields for each of the 400 test entries, reviews the results, applies the rules to determine each supplier's compensation level, approves and sends approximately 400 approval letters to VSS suppliers, and finally uploading the results to the BAS. Composite reports of level of support are provided both to our Grid Operations department and to the Transmission Owners. This project would automate these manual processes.

ICAP Reference System Phase 2

In 2015, MMA is proposing the development of Phase 2 enhancements of the ICAP Reference System, by means of expanding its functional capabilities and extending the scope to include other MMA processes such as Monthly Special Case Resource and Mitigation Reports. MMA

collects extensive data from the NYISO Market Participants in order to implement the ICAP market mitigation measures. In the past the data collection process, calculations, communication and documentation for the purposes of ICAP market mitigation has been done manually and ad-hoc. MMA recognized the benefits of streamlining the process through the development of a web-based data portal and spearheaded the development of the ICAP Reference System for the Going Forward Costs (GFCs), Physical Withholding, and Buyer Side Mitigation (BSM) processes among others. The new system was implemented in 2014.

The system was designed to streamline the data collection process, to perform analysis and aid communications among Market Participants, NYISO staff, and NYISO's consultants. In addition, the system can clearly identify all calculations and necessary inputs, which would provide MMA with a robust IT supported means to deal with the data. This increases transparency, helps avoid disputes, and diminishes the likelihood of potentially costly market errors. The requested enhancements will further improve the accuracy, efficiency and effectiveness of required processes.

ICAP Auction Validating and Reporting Phase 2

In 2014 the ICAP Universe was developed, with the scope of replacing the Access queries in IMO's procedures with an IT supported product. MMA is in a position to benefit from IMO's project due to an interest in very similar data, which from an IT perspective, "comes from the same place." An expansion to the ICAP Universe would provide MMA with a robust, IT supported means to access data, which otherwise must be found ad-hoc using whatever means are available at the time.

External CRIS Rights for non-UDR Transmission Expansion

This project was repeatedly proposed by a Market Participant in the stakeholder process for consideration by NYISO. A concern was raised that there are no appropriate Tariff provisions allowing Market Participant-funded transmission upgrades enabling incremental transfer capacity at an external interface and associated generation supplies to be considered in the Class Year process and obtain incremental External CRIS Rights.

The proposal is to consider whether it is desirable to amend the NYISO's OATT and/or MST to allow a Market Participant that funds upgrades at an external interface, or on a TO system at an external interface, that alleviate existing TTC constraints at the external interface, the right to apply for External CRIS Rights up to an amount corresponding to the incremental external interface capacity resulting from its project. Under the proposal, the Market Participant would be able to exercise the assigned External CRIS Rights under the following conditions:

- The Market Participant-funded project must be included into a Class Year Study process in order to assess among other things, the Deliverability of the incremental external generation supply from an External Control whose capacity can be eligible to participate as ICAP Resources;

- For reliability evaluation purposes, seasonal import limits would not be considered as emergency assistance;
- If the Market Participant is assigned External CRIS Rights, no other Market Participant will be allowed to request import rights or External CRIS Rights using the resulting incremental external interface capacity;
- The existing Tariff provisions regarding the incremental TCCs would remain unchanged.

The NYISO will evaluate the desirability and feasibility of this market design concept and alternative concepts if appropriate, including potential impacts on various planning procedures and studies such as Class Year Deliverability studies, Import Rights studies, LCR studies, and long term reliability and economic planning studies; potential impacts on all External Control Area interfaces; and an evaluation of the significant and complex software revisions that are anticipated to implement this market design concept or a desirable alternative (if any is identified in the evaluation process.)

Locational Planning Requirements – Pre-define Capacity zones (SOM) ~~and Develop Rules for the Elimination of Capacity Zones or Achievement of Price Convergence~~

Develop the rules for reflecting locational planning requirements in the capacity market to better enable the market to provide locational signals in the future by predefining a set of interfaces or zones that address potential resource adequacy needs and highway deliverability constraints. ~~; and/or develop the market rules to allow for the elimination of capacity zones or achieve price convergence when the deliverability constraint(s) that caused its creation is effectively removed such that the constraint can no longer be expected to bind. These proposals will be considered for conceptual approval either together or separately.~~

Develop Rules for the Elimination of Capacity Zones or Achievement of Price Convergence

This effort would be to evaluate whether another mechanism for zone elimination is necessary. If it is deemed necessary, then further evaluate the market design concepts for developing the market rules to allow for the elimination of capacity zones or achieve price convergence when the deliverability constraint(s) that caused its creation is effectively removed such that the constraint can no longer be expected to bind.

Behind the Meter: Net Generator Model

The NYISO's market rules do not include provisions that clearly explain how generation whose primary purpose is to serve onsite load can sell it excess generation into the wholesale electricity markets.

This effort would be to evaluate market design concepts and propose appropriate modifications to the NYISO tariffs in order to allow participation of a new type of generation resources in the wholesale energy, ancillary services and capacity markets to self supply a host load with a portion of its capability while offering all or a portion of the surplus or “net” capability into the NYISO’s capacity, energy and ancillary services markets.

Expand BSM to Address Uneconomic Transmission Investment (SOM)

Evaluate the market design options to enhance Buyer-Side Mitigation measures that address the effects of uneconomic transmission investment on capacity market prices.

Modify Demand Curve to Minimize Costs of Satisfying LCR & Incent Siting Capacity Where It Provides the Greatest Reliability Benefit (2014 SOM 1c)

Create a dynamic and efficient framework for incenting the lowest cost solutions when setting and meeting locational planning requirements in the capacity market. This will enable the NYISO capacity market to better provide locational signals in the future and result in more efficient market outcomes.

Winter DMNC Temperature Adjustments

Modify the rules for temperature adjusting a resource's ability to participate in the winter capacity auction to utilize cold weather (consistent with NYCA peak load) conditions, rather than the current rules that utilize local transmission districts independent peak load conditions.

ICAP Imports Rights Design Re-assessment

Internal Import Rights project would reassess the ICAP Import reservation process in order to define changes that enhance the availability of UCAP, and MP access to the import market segment, simplify and automate the procurement process, and eliminate many of the manual processes that are involved, including the gathering and processing of MP faxes and the multiple ad hoc spreadsheets used to calculate: import headroom, interface availability, and interface limits, and track MP requests for import MWs.

Locational Planning Requirements - Grant Internal Capacity Deliverability Rights for Transmission Upgrades into a Local Area (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 private investors upgrade the AC transmission into a local area.

Fuel Assurance: Market Design Concepts

The NYISO will review various market design changes that may be necessary to provide 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.

ICAP AMS Enhancements Phase 3

The AMS software was developed and implemented to simplify and support the AMO business functions. Additional opportunities to automate processes are under consideration for 2015 and 2016.

External CRIS Right (4 strike rule) Rule

Stakeholders have requested the NYISO to modify the rules set forth in Section 25.7.11.1.3 of Attachment S of the OATT regarding the termination of External CRIS Rights. Certain stakeholders have expressed concern regarding the punitive nature of the '4 strike rule' under which all External CRIS Rights are lost upon the fourth supply failure. The NYISO proposed a concept to extend the number of strikes before all rights are terminated and to allow terminated MW of External CRIS to be available for the FCFS Import Rights process.

Discuss concept for applying BSM measures in the NYCA

Certain stakeholders have brought a Section 206 complaint to FERC alleging the exercise of market power outside the NYISO localities. This project is to discuss the concerns and the market concepts raised in the 206 complaint

DEMAND RESPONSE

Demand Response in the Real-Time Energy Market

The objective of this project in 2015 is the creation of the Functional Requirements Specification (FRS) to integrate the demand response resources into NYISO's real-time markets based on approved market design concepts and the related market rules developed through the stakeholder process.

FERC Order 745: Monthly Net Benefits Test

This project will assess and implement changes resulting from an implementation order from FERC in response to the NYISO's August 2013 compliance filing and any results from the reclarification/rehearing request on cost allocation. This project is expected to have software and procedural changes, the scope of which will remain unknown until the NYISO receives an implementation order.

SCR Performance Obligations

This project will implement the market rules to revise the performance obligation requirements of Special Case Resources (SCRs) and Energy Limited Resources (ELRs) 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.

This project will also eliminate the requirement for a SCR to perform in the mandatory first performance test in the Capability Period when the SCR has been required to perform in a mandatory event.

Metering Infrastructure Requirements for Demand Response

The objective of this project is to develop the Functional Requirements Specification (FRS) for NYISO's infrastructure to support demand response metering and communications.

DRIS Enhancements for DR Program Administration

The NYISO Demand Response Operations (DRO) group performs several routine functions related to the administration of the Demand Response programs. Automating key manual processes will increase efficiency.

Market Rule Changes to SCR Baselines

This project will develop the market rule changes resulting from findings and recommendations of the SCR Baseline Study.

Expanding on Selected Distributed Energy Resource Concepts to Further Align with REV

In this project, the NYISO proposes to refer to the concepts provided in the NYISO's Distributed Energy Resource Study, and expand on selected concepts for further study, evaluation and alignment to the New York State Public Service Commission's proceeding "Reforming the Energy Vision (REV)".

ENERGY MARKET PRODUCTS

Coordinated Transaction Scheduling with ISO-NE (SOM)

As part of the Broader Regional Markets initiatives, ISO New England (ISO-NE), and the New York Independent System Operator (NYISO) commenced the joint Inter-Regional Interchange Scheduling (IRIS) project. The main goal of this project is to improve price convergence between proxy buses of the two ISOs. For the IRIS project, two approaches were proposed according to the IRIS white paper[1] Tie Optimization (TO) and Coordinated Transaction Schedule (CTS). The two ISOs agreed to pursue the latter. To implement the CTS approach, two design options were also proposed: the supply curve method proposed by NYISO; and the marginal equivalent algorithm suggested by ISO-NE. The two ISOs agreed to pursue the supply curve method based on the assumption that it is much easier to implement. In 2012 FERC accepted the tariff changes to implement CTS.

Scheduling & Pricing: Comprehensive Shortage Pricing (SOM)

Revisions to the shortage pricing mechanisms were identified during the Q2 2014 Comprehensive Shortage Pricing Review. Improvements include adjustments to the locations for which reserves are procured, the type and amount of reserves procured for those locations, and updates to the reserve demand curve MW and price value set points.

This effort will look to implement market rules surrounding the procurement of operating reserves that better align with current operating practices and reliability needs.

Scheduling & Pricing: Comprehensive Scarcity Pricing (SOM)

Revisions to the scarcity pricing mechanism were identified during the Q2 2014 Comprehensive Shortage Pricing Review. Improvements were identified in the implementation of scarcity pricing and application of scarcity prices at external locations; specifically, through the modeling of a scarcity reserve product in the optimization during reliability Demand Response (DR) calls.

This effort will look to move Scarcity Pricing into the real-time scheduling and pricing optimization engine to better align scheduling decisions with pricing outcomes.

[1] IRIS white paper (ISO New England), January 5, 2011, [Online] *www.iso-ne.com/pubs/whtpprs /iris_white_paper.pdf*

Fuel Assurance: Market Design Concepts

The NYISO will review various market design changes that may be necessary to provide 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.

Gas-Electric Coordination: Constrained Fuel Supply Bidding (SOM)

There are at least two types of fuel supply constraints that cannot be adequately reflected in the day-ahead generator offers.

First, during periods of high gas demand, generators may be subject to hourly Operation Flow Orders (OFOs) that require them to schedule a specific quantity of gas in each hour of a 24 hour period. A supplier that offers a flexible range between its minimum and maximum generation level in the day-ahead market is at risk of being scheduled at its maximum generation level for a small number of hours. This would require the generator to schedule enough gas to run at its maximum generation level for the 24-hour gas day, which may be far more than is necessary to meet the day-ahead schedule.

Second, during periods of high gas prices, oil-fired and dual-fueled generators provide significant economic and reliability benefits to the system. Many such generators are limited by air permit restrictions and/or by low oil inventories. It would be beneficial for the generator to be able to conserve their limited oil-fired generation for periods when it is most valuable.

The effort would look to develop market enhancements to better reflect these constraints into the NY wholesale energy market.

Behind the Meter: Net Generation Model

The NYISO's market rules do not include provisions that clearly explain how generation whose primary purpose is to serve onsite load can sell it excess generation into the wholesale electricity markets.

This effort would look to evaluate market design concepts and propose appropriate modifications to the NYISO tariffs in order to allow participation of a new type of generation resources in the wholesale energy, ancillary services and capacity markets to self supply a host load with a portion of its capability while offering all or a portion of the surplus or "net" capability into the NYISO's capacity, energy and ancillary services markets.

Disaggregated Virtual Trading

In each of the 2006 through 2012 State of the Market Reports, the NYISO's Market Monitoring Unit (MMU) highlighted an issue with energy market price convergence in New York City. Specifically, Dr. Patton identified an apparent divergence between day-ahead and real-time energy prices in specific New York City load pockets. That concern led to the recommendation to consider allowing virtual trading at a more disaggregated level or identify other means of improving convergence in the load pockets.

This effort would look to expand the virtual trading capabilities to include trading at a nodal level.

External Transaction Balancing Protection

Recent system conditions lead to the inefficient scheduling of external transactions due to the reduction in transmission capability between the day-ahead and real-time markets. This project would look to protect market participants from financial harm should similar conditions arise in the future.

Energy Storage Optimization

With the advancement of MIP technology, the NYISO will look for ways optimize the energy availability of storage devices. This project would look at ways to optimize, on a least cost basis, the management of energy by selecting the most efficient dispatch mode (generator mode vs. charging/pump mode).

5 minute Transaction Scheduling

In 2011, the NYISO activated 15 minute transaction scheduling with Hydro Quebec followed by PJM. 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').

Scheduling & Pricing: RTD/RTC Forward Horizon Coordination Improvements (SOM)

Currently, RTC and RTD scheduling and pricing time horizon does not align with the ramp period for interchange transaction which contributes to transient shortage conditions and unnecessary price volatility. The NYISO will look to better align RTD and RTC intervals with the interchange ramp period.

Long Island PAR Optimization (SOM)

Potomac Economics has identified inefficiencies in the scheduling and pricing of PAR flows between zones J and K. The scheduling of these PAR flows is based on a currently active Operating Agreement between LIPA and Con Edison.

This project will look to develop a market design that would allow for more efficient scheduling of flows across the PARs between zones J and K, while respecting the rights provided within the currently executed Operating Agreement.

Scheduling & Pricing: Hybrid GT Pricing Improvements (SOM)

The current process for determining eligibility of GTs to set prices is the result of complex steps in the hybrid dispatch within the optimization. At times, this logic can prevent some economic GTs from becoming eligible to set price.

This effort will look to improve the efficiency of the GT pricing with the energy market to better align with reliability needs and operator actions.

Virtual Trading using Spread Bids

The ISO's market design should be enhanced to allow for directional virtual bidding using similar functionality developed for the Coordinated Transaction Scheduling (CTS) projects. Directional virtual trading allows for the coordinated scheduling of a linked pair of virtual supply and virtual demand bids between two distinct locations in the NYCA. Leveraging the CTS functionality ensures bids will either both clear the market, or neither bid clears. This proposed enhancement would be an added feature to the current zonal virtual bidding design as well as a future Disaggregated Virtual Trading (DVT) model If implemented this enhancement should result in more efficient utilization of the transmission interfaces between zones and eventually more granular areas once DVT is implemented.

ENTERPRISE PRODUCTS

NERC CIP v5 Planning & Conversion

This initiative will enable NERC CIP v5 compliance and audit readiness, which will require the NYISO to modify processes, procedures, record keeping, and systems from compliance with version 3 to version 5 of the NERC CIP standards according to FERC Order 791.

NERC CIP-005 v5 Electronic Security Perimeter

The NYISO Electronic Security Perimeter (ESP) will need to be evaluated and enhanced to meet the requirements of the NERC CIP-005 v5 - Electronic Security Perimeter standard.

NERC CIP-010 v5 Configuration Management

The NYISO configuration management process and tools used to manage its software assets throughout the development to production lifecycle will need to be evaluated and enhanced to meet the requirements of the NERC CIP-010 v5 Configuration Change Management standard.

NERC CIP-011 v5 Information Protection

The NYISO information protection practices, and potentially the systems that implement audit controls around these practices, will need to be evaluated and enhanced to meet the requirements of the NERC CIP-011 Information Protection standard.

Enterprise Project Management Phase IV

This project continues the EPM Phase III (Resource Management) initiative started in 2014 by rolling out processes and tools to support the resource planning efforts associated with the annual project planning and budgeting cycle.

Stakeholder Services Suite Phase II

This initiative will build on the initial phase of this project and enable the NYISO Stakeholder and Member Relations (SMR) team to better manage customer interactions from initial contact, to registration, training, and ongoing communication. Phase I will provide customers with a self-service, web-based portal to view inquiry status and manage contact information. Phase II will integrate the existing solution with various other existing NYISO systems to allow for more efficiency.

Identity and Access Management Phase IV

To maintain NYISO's security posture and compliance with NERC Critical Infrastructure Protection standards, NYISO is in progress on a multi-year identity and access management (IAM) initiative to control cyber and physical access to its technology systems and physical facilities. IAM Phase IV builds upon the completed deliverables from earlier IAM project phases and will enhance NYISO's current cyber/physical security and compliance programs by integrating IAM into physical security systems and additional cyber assets.

Enterprise Technology Monitoring Phase II

As NYISO applications and infrastructure become increasingly complex an enterprise technology monitoring system will provide overall real-time situational awareness to the availability and performance of these assets and enable NYISO to anticipate and prevent issues before they become critical and result in outages. Enterprise monitoring aims to quickly identify problems, reduce the mean time to recovery (MTTR) of incidents, pinpoint performance problems, centralize event management, and collect data for performance trending and capacity monitoring. This phase will build on the 2014 planning effort, and will begin a multi-year monitoring solution implementation starting with core NYISO infrastructure systems.

Application Platform Upgrade Phase II (Linux)

The servers supporting critical NYISO applications, including market and grid operations, are obsolete. The market web applications are running on 10 year old servers that are end of life and the industry is evolving away from the Sun Solaris and HP-UX operating systems which are currently the underpinning of NYISO applications. In 2012, ABB announced the retirement HP-UX in lieu of Linux in their next EMS product. This is a continuation of the 2014 initiative and will establish a Linux foundation for all NYISO applications in 2015 – 2016.

Windows Server Upgrades

This project will continue the multi-year initiative to upgrade NYISO's Windows servers from Windows Server v2003, which will be going off support in July 2015, to Windows Server v2008 or v2012, as applicable. These upgrades will maintain currency on the Microsoft server platform, accommodate growth and resiliency, and allow IT to continue to provide the technologies needed to support business services on this platform across the organization.

Improve MP Access Security

This initiative will enable the NYISO to improve the Market Participant access security, introducing up-to-date practices and technology to create enhanced controls and security. Improvements include authentication and authorization mechanisms and implementation of NAESB PKI standards for certificate use.

Integration Platform Availability Improvements

This project will build on the NYISO Integration Platform capabilities developed under the previous Ranger Messaging Integration initiatives. This effort will enhance the platform to handle the performance and availability requirements of reliability applications, which are more stringent than the market applications it currently supports. It will also significantly improve the availability of the integration of existing market applications (e.g. M2M with PJM) and ensure the platform is on a vendor supported version capable of handling future market and reliability application integration needs.

Storage Infrastructure Redesign

The NYISO has a large storage infrastructure to collect and store all operational and market data. Systems such as Smart Grid, where thousands of PMU data points are stored every second, and Broader Regional Markets, where data is shared (and stored) with neighboring ISO/RTOs, continue to increase NYISO data storage requirements. The current storage infrastructure is nearing the end of its useful life and new technologies are available that will more efficiently and effectively accommodate the expected growth of data. This project is the beginning of a multi-year effort to replace the existing storage infrastructure with the next generation of storage technologies.

Market Test Environment

NYISO Market Participants need a means of testing their business processes and systems against the NYISO market to validate outcomes and ensure proper inter-system operations. Today there is no comprehensive means of conducting such testing or enabling training for MP representatives outside of the NYISO production environment. This project will create a permanent external-facing market test environment (i.e. “sandbox”) where market participants can conduct testing against a non-production environment, including MIS, JESS, DRIS, Credit, ICAP, TCC and other functions.

FINANCE PRODUCTS

Regulated Transmission Cost Recovery Implementation

Modifications are needed to the Billing and Settlements System and Consolidated Invoice to provide for cost recovery of regulated transmission projects deriving from the NYISO's Comprehensive System Planning Process. These projects may be required to meet reliability, economic, and/or public policy needs. These modifications will also accommodate cost recovery for the Transmission Owner Transmission Solutions (TOTS).

Procurement Enhancements

The Procurement Enhancement project is the completion of the 2014 project. It will deploy the automated Purchase Order Request (POR) solution defined in the 2014 Procurement Enhancement Project Functional Requirements Specification (FRS) document. It will provide more automation of the POR creation and approval process.

Manual Adjustment Redesign

A redesign of the manual adjustment functionality in Con Invoice is needed to provide automation of the process to accommodate system computation and allocation of hourly adjustments and adjustments beyond the current monthly invoice period. Additionally, functionality is needed to upload a file of manual adjustments for instances when the manual adjustments require external calculations.

CMS True-Up Exposure

The NYISO has determined that in situations of high energy price volatility and demand, the NYISO may have increased true-up exposure. As a result, changes to the credit policy to account for Market Participants with true-up exposure are necessary. This project involves revisions to the tariff as well as updates in the Credit Management System (CMS).

Oracle Financials – Fixed Assets

This project would be used to continue to leverage available functionality within the Oracle Finance product. It would focus on implementing the Oracle Financials Fixed Assets Module for more efficient fixed asset tracking and reporting. The project would involve setup, administration and reporting.

Budget versus Actual Automation

This project would allow for automation of certain components of Budget vs. Actual monitoring and reporting that are currently manual processes.

RFP Evaluation Tool

The Procurement Department and Business Owners need a tool specifically for development, administration and evaluation of 'Request For Proposals' (RFPs). The tool would provide standardization for the entire RFP process (creation, editing, approval, distribution, selection and storage) and shorten the RFP lifecycle.

DAMAP Enhancements

Changes are needed to ensure committed DAM Reserve and Regulation Bids are submitted into the Real-Time market appropriately for evaluation. The NYISO will look to change several bid submittal and validation rules, as well as its DAMAP rules to ensure both the Reserve and Regulation markets are evaluated appropriately in the real-time for DAMAP. These changes will require tariff revisions.

North Subzone Redistricting

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 short term solution, which was effective 12/1/2008. The current solution is a manual process administered by NYPA, National Grid, and the PSC requested NYISO to review the short term solution and develop a long-term solution.

Rate Schedule 1 Technology Automation

Rate Schedule 1 Technology Enhancements are needed to automate manual processing and manual adjustments of non-physicals, the TCC and Virtual Markets. This project will provide automation of Rate Schedule 1 to improve efficiency and reduce risk associated with manual processing.

CMS Financial Risk Assessment Tools

The NYISO is developing a Financial Risk Assessment process used to evaluate each Market Participant's potential risk exposure. This project will ultimately provide Corporate Credit with automated tools and processes to replace the manual processes associated with the risk assessment.

CMS Ratings Automation

Redesign of the Credit Management System (CMS) application's Credit Ratings functionality is needed to ensure consistent updates from the Credit reporting agencies (S&P, Moody's and Fitch) are received by the CMS and integrated into daily re-calculations. This project is intended to redesign the automated functionality of ratings in the CMS to ensure Market Participants are receiving the appropriate amount of unsecured credit and that the NYISO does not encounter unnecessary or unexpected exposure.

CMS External Transactions Timing Adjustments

This project includes changes to the Credit Management System (CMS) specific to the credit requirements for External LBMP transactions. Currently, the CMS calculates and holds credit from the time of bid submission for all External LBMP Transactions. Market Participants may submit these bids well in advance of the market day and credit is held from the point of bid submission until it has been invoiced and paid. At the request of Market Participants, the NYISO has developed a concept to calculate and hold credit on these transactions beginning in a timeframe that more closely aligns with the actual flow of the transaction. Tariff changes are needed to support this project.

CMS ICAP Spot Market Offers Enhancement

Currently, the ICAP Spot Market bidding requirement does not account for capacity sales, which may unnecessarily increase credit held by the NYISO prior to the ICAP Spot Market Auction. As part of an analysis and a market design concept on the ICAP Spot Market Bidding Requirement, the NYISO proposed a concept to account for Spot Market capacity sales prior to making collateral calls. This project includes changes to the Credit Management System (CMS) specific to the ICAP Spot Market Bidding Requirement. It will also require changes within the ICAP AMS to allow Market Participants the opportunity to enter offers of available capacity prior to the start of the Spot Market auction. Tariff revisions are necessary to support these credit policy and ICAP market changes.

CMS Unbalanced Trading Hubs

This project would implement the credit requirements needed to address the risk associated with unbalanced energy MWhs and remove the bidding check that enforces balanced Trading Hub bids.

The credit calculations would be performed any time a trading hub bid is confirmed, updated or deleted and the bids will be accepted or rejected based on the availability of collateral to support the credit requirement for the bids.

OPERATIONS & RELIABILITY PRODUCTS

FERC Funded Rerun Phase 2

The NYISO's ability to simulate the Day-Ahead Market was instrumental to the success of FERC's Office of Enforcement ("OE") actions against Constellation. As such, the FERC OE is requesting that all ISOs develop the capabilities demonstrated by the NYISO, and in our specific case, to expand upon on our current fundamental analysis capabilities. One million dollars in funding was provided to the NYISO as part of the Constellation Settlement. After consideration and review of numerous possible enhancements, MMA has settled on two primary categories of modifications to the Market Operations Software (Ranger) that meet with the FERC OE's requirements:

1. RTS Simulation Capability
2. Enhancements to MMA's SUEDE environment

FERC Funded Rerun Phase 3

The NYISO's ability to simulate the Day-Ahead Market was instrumental to the success of FERC's Office of Enforcement ("OE") actions against Constellation. As such, the FERC OE is requesting that all ISOs develop the capabilities demonstrated by the NYISO, and in our specific case, to expand upon on our current fundamental analysis capabilities. One million dollars in funding was provided to the NYISO as part of the Constellation Settlement.

This project proposes to utilize the remaining funds on scope items that have been reviewed and approved by FERC.

EMS/BMS System Upgrade

This is the first phase of 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. The first phase will identify the must have requirements for Operations/Reliability and Markets. An interview, documentation and analysis will be completed to determine the top EMS vendors that can meet the "must have" requirements of the NYISO through a series of interviews with potential vendors, other ISOs and consultants.

Breaker Level Market Modeling

Presently, the BMS modeling of breakers does not reflect certain intricacies that the EMS system does. Specially, the BMS uses a bus model for its power flow calculations. More and more substations are being developed with ring buses which have internal configurations capable of splitting the substation. The intent of this project is to allow the BMS to match the defined bus model in the EMS system for these contingencies.

Transmission Service Charges: Rate Update

The purpose of this project is to modify the calculation process used to allocate export transaction shares so that the Transmission Owner's (TO) can invoice their Transmission Service Charges (TSC) for export and wheel-through transactions.

BES: Contingency Analysis Updates

With the institution of the bulk electric system (BES) definition to include all lines 100KV and above, the number of contingencies is growing significantly. This leads to several outcomes which necessitate changes to the process and software used to secure the NYCA BES. Specifically, the current process of merging EMS and BMS contingencies into a subset of the worst 100 contingencies for continuous review by the Grid Operations staff needs to be enhanced. At the same time, the number of contingencies is becoming too large to manage without separating the NYCA into sections with displays and filtering available to the current SO.

BES: Interconnection Reliability Operating Limits (IROL) Visualization

Phase1 charts display flows against static IROLs based upon an 'all equipment in' scenario. The purpose of this project is to back feed dynamic limits to Phase1 so that operators get visual indicators of flow against the true limits in the event Ranger is unavailable.

Dispatcher Training System (DTS) Sustainability Phase II

Today, the NYISO utilizes the Dispatcher Training Simulator (DTS) to maintain compliance with NERC Standard PER-005 and keep our operators licensed. Additionally, the TOs join ISO staff in training on our lone simulator environment to maintain their skills on black start and other emergency scenarios. The need to provide training of upcoming functionality associated with BRM, SGIG, wind resource management and other features while simultaneously certifying operators and TOs, as required by NERC, has proven to be especially difficult. With only one system serving both simultaneous needs, the long and unpredictable downtime required to redeploy, configure and set up training scenarios has caused staff rescheduling and other significant issues.

Gas-Electric Coordination: Fuel Availability Self Reporting (SOM)

This project will enable generators to report their available fuel, expected rate of burn and other pertinent information. This will give the NYISO more visibility into availability limitations of the NY generation fleet.

MetrixIDR (Load Forecaster Upgrade)

NYISO's current Load Forecaster application is supplied by Itron, Inc and is built on their NDauto product. NYISO is the last Itron customer to be utilizing NDauto. Over the past 10 years, Itron has had a dedicated software development team working on enhancing MetrixIDR to meet the requirements of a global customer community. In contrast, Itron only made enhancements to NDauto at the request and financing of NYISO. In order to mitigate risk and enhance the NYISO's load forecasting capabilities, this project would replace NDauto with MetrixIDR. The MetrixIDR product will enhance NYISO's ability to create 90/10 forecasts, solar forecasts, etc.

The 2015 MetrixIDR project is the continuation of the 2013 MetrixIDR project. In 2013, the team focused on requirements, learning the new application and developing supporting interfaces. The 2015 project will focus on testing and implementing the MetrixIDR application in production.

MMA Market Operations Report Automation

Market Mitigation and Analysis uses a series of SAS reports built over time to produce the Monthly Market Operations Report that is presented to the Board of Directors, several committee meetings, and the public (via web posting). The NYISO is obligated to produce this report to maintain market transparency.

Today, the NYISO spends many hours of manual data collection to complete the report. Very often this report is produced/reviewed under severe time constraints with notable risks of violating the Market Participant Responsiveness corporate goal which requires timely posting of

meeting materials. Technical difficulties that require emergency fixes often compound the manual production and tight deadline issues.

This project will address these issues by simplifying data collection, automating SAS programs, eliminating unnecessary manual processes, and bringing the SAS programs under IT control. MMA believes that this project could be dependent on the Information Management Roadmap project.

2015 Reference Level Software (RLS) Enhancements

The Reference Level Software (RLS) application builds reference levels for generators that participate in the NYS electricity markets. The 2015 Enhancements project will refine the RLS application to include enhancements requested by the MMU, MMA and MPs. The proposed enhancements include: reference coordination of energy day and gas day, minimum generation cost based reference price enhancements, additional reporting as well as improvements to reference data submissions.

Posting of Line Derates / Uprates

The NYISO currently posts limited line derates / uprate information in the monthly reports. They only show those re-ratings to which NYISO can attribute some portion of the balancing congestion residuals. MPs have requested a more complete set of line derates / uprates be posted on an increased frequency. This project will determine what is available from the EMS/BMS to be posted, what is the frequency it can be posted, and create the posting.

PLANNING PRODUCTS

Economic Planning Model Management

During 2014 the NYISO completed a review of the System and Resource Planning process for creation of economic models. Currently System and Resource Planning utilizes multiple economic models for various interregional and regional studies. Different software analysis packages require models in different formats. For interregional studies, Planning starts with a model of the Eastern Interconnection from Ventyx Velocity Suite and performs analysis using ABB/Ventyx GridView and GE MAPS applications. The NYISO applies updates to the model as appropriate in order to generate the base case model for starting the study. For regional studies, Planning uses GE MAPS software requiring the GE MAPS format. This project will continue the phased approach in developing software for the support of model creation within System and Resource Planning.

TCC PRODUCTS

TCC Revenue Allocation Automation

This project continues the 2011-2013 efforts to provide for TCC Auction 'End State' functionality (described in NYISO Tariff) through a series of incremental software enhancements to the TCC Automated Market System (AMS) and supporting systems.

The NYISO collects TCC revenue from the administration of the TCC Markets and the allocation of Fixed Price TCCs. The allocation of revenue associated with the TCC Markets to the Transmission Owners (TOs) is currently a manual process performed by TCC Market Operations (TMO) staff using Excel and SAS toolsets. TCC Revenue Allocation Automation would update the TCC AMS and TCC Automated Validation System (AVS) to include functionality to support the TO Revenue Allocation process.

The TCC AMS will be updated to include the revenue allocation process by which TCC auction revenues are divided among the New York Transmission Owners. The TCC AMS will also include the calculation of the Day-Ahead Market (DAM) Net Congestion Rent (NCR) Allocation Factors. These allocation factors are developed for each month and are used by Settlements to either pay or charge the TOs depending if there is a surplus or shortfall in the sum of the TCC congestion rents when compared to the congestion rents in the DAM for that month.

The TCC AVS will be updated to include the validation of the revenue allocation process and the DAM NCR Allocation Factors. This will include the addition of a set of validations into the AVS used to validate the new functionality in the TCC AMS. Revenue Allocation validations in the existing VB6 framework are expected to be retired as part of the project.

Balance-of-Period – (AMS, AVS & CMS)

This project continues the Revenue Allocation Automation efforts to provide for TCC Auction "End-State" functionality (described in NYISO Tariff) through a series of incremental software enhancements to the TCC Automated Market System (AMS) and supporting systems.

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 AMS and TCC Automated Validation System (AVS) to include functionality to support the multi-period 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).

The TCC Revenue Allocation process performed by TCC Market Operations (TMO) will need to be automated as part of the *TCC Revenue Allocation Automation* project. The complexities associated with the multi-period BoP auction format require the currently manual TO Revenue Allocation process to be automated. This project is a dependency for the Balance-of-Period project to be implemented.

TCC AMS Round Type and Upgrade

The purpose of this project is to update the TCC Automated Market System (AMS) by adding a new round type, and addressing defects and enhancements of TCC AMS, and update the underlying technology of the system. The TCC AMS was first implemented in 2006 and since then a number of project efforts have incrementally improved the capabilities of the system. The previous project efforts focused on implementing new functionality to support an evolving market and meet MP needs but typically did not revisit items desired from past projects. This project will holistically evaluate the system to fix any defects and enhancements found over the years and update the technology the system runs on in order to optimize the system and provide a stable base for future projects. In addition, a new round type will be added. This round type would be used by TCC Market Operations (TMO) for purposes of performing a feasibility analysis or any detailed analysis of auction situations that is required as a result of internal or external inquiries. This new round type would not impact production data.

TCC On-Peak/Off-Peak

Some Market Participants have shown interest in introducing an On-Peak/Off-Peak auction format. This project would develop the market designs necessary for offering On-Peak/Off-Peak TCCs including both changes to the TCC Market and development of appropriate credit policy.

The On-Peak/Off-Peak auction format will allow MPs to purchase or sell TCCs that are active either for On-Peak hours and/or Off-Peak hours. There are a number of market design options that must be considered before this can be implemented. Once implemented, MPs would be able to purchase On-Peak and/or Off-Peak TCCs and be required to hold collateral for those TCCs depending on the credit policy that is developed.