2018 Project Candidates

Product and Project Management

4/26/2017

This document represents potential 2018 project candidates identified through (1) the State of the Market (SOM) 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 the 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.

Enterprise Information Management - Analytics Environments – Phase II

The NYISO's information management roadmap calls for consolidating the desktop and server environments of the analytics system into a single cohesive environment. This consolidation will reduce licensing and maintenance costs and improve the reliability of the environment.

Public Website Refresh [Continuing]

The NYISO's current public website www.nyiso.com is in need of a redesign. The redesign will enhance the user experience, enable improved access from mobile devices, and improve overall design and utility of the site. This project, which is a continuation of a 2017 project, will provide new frameworks for the site, which will make it easier to locate information and use key functionality. It will also allow for faster and easier site maintenance, which will more readily allow the site to be kept current. This project will also include the completion of a new public website calendar (which was started as a separate project in 2017).

NAESB PKI Phase II [Continuing]

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 II will continue to monitor the transition period while finishing up additional internal efforts to finalize the cutover to accepting only NAESB compliant certificates. This project will complete the efforts to fully migrate to NAESB certificates and will fully retire NYISO-provided certificates.

Mobile Functionality

The NYISO would enhance mobile functionality 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 easier accessibility from mobile devices. Work would be coordinated with the Public Website Refresh project.

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Intranet Redesign

The NYISO has an outdated Intranet that makes it time consuming and difficult for employees to locate information necessary to do their jobs. This project would leverage the work being done on the Public Website Redesign Project to produce a new Intranet for serving NYISO employees more efficiently.

eTariff Webviewer Redesign

A 2017 eTariff Webviewer enhancement project is in process to provide improved search and navigation capabilities within the eTariff Webviewer on the NYISO public website. This new project would add to those enhancements by redesigning the main user interface to make it easier and more intuitive to use than the current version.

Capacity Market Products

Automate ICAP Import Rights [Continuing]

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. This project will eliminate the fax process and many of the manual processes used to calculate import headroom, interface availability, and interface limits. It is a continuation of efforts started in 2016 to develop functional requirements, and in 2017 to complete software design.

RMR Cost Recovery Phase II [Mandatory]

In order to comply with FERC's mandate to have the ability to provide RMR contracts, software updates must be made to multiple NYISO systems which incorporate Bid to Bill functionality. This project is a continuation of 2017 efforts to develop functional requirements for system changes.

ICAP AMS Redesign & Test Improvements Phase II [Continuing]

ICAP AMS is a NYISO application that 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. In 2016, the NYISO identified a multi-phase project for 2017 to start the process of redesigning the ICAP AMS in order to support future requirements. This project is a continuation of Phase I project efforts started in 2017 to re-write the ICAP AMS application over multiple phases to improve end-user experience (MPs, MMA, and IMO), increase code quality and maintainability, and automate and streamline testing.

ICAP AMS Redesign & Test Improvements Phase III [Continuing]

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Alternative Methods for LCRs (SOM) [Continuing]

This project is a carryover from the 2017 effort to identify an alternative method for calculating the Locational Minimum Installed Capacity Requirements (LCRs). This project would evaluate any required tariff revisions and/or changes to methodology documentation and internal processes in order to seek to implement the alternative methodology developed in 2017.

CRIS for External-ROS Transmission Investments [Mandatory]

This project is a continuation of the market design discussions conducted in 2015 and is the subject of FERC Docket ER17-505 in 2017. The 2015 design discussions presented the market design concepts available for allowing Market Participant-funded transmission projects for new transmission lines or upgrades to scheduled lines to obtain capacity rights to sell the incremental transfer capacity from a neighboring Control Area into the ROS region. Consistent with the NYISO filing in FERC Docket ER17-505, the NYISO will develop a market design concept to allow capacity rights be assigned to the financial sponsor of the transmission projects.

Treatment of Locality Exports and Imports (SOM)

This project will continue to address import and export issues associated with work being conducted in 2017 that addresses Locality Exchange Factors for exports. The objectives are to study and, if necessary modify, the capacity market and planning processes to better account for capacity that is imported from and exported to neighboring Control Areas, including the impacts that imports over AC interfaces have on locational requirements.

On Ramps and Off Ramps

Evaluate a locational framework for creation (on ramps) and elimination (off ramps) of Localities that ensures that locational capacity prices would adjust to reflect changes in market conditions. This project will leverage the prior stakeholder discussions on Zone Elimination and On and Off Ramps.

Dynamic Capacity Zones (SOM) [Future]

Evaluate a dynamic locational framework that ensures that locational capacity prices would immediately adjust to reflect changes in market conditions. This project will consider the MMU

SOM recommendations regarding a dynamic zone construct. This project will also leverage the prior stakeholder discussions on Zone Elimination and On and Off Ramps.

Performance Assurance

This project is a carryover from the NYISO's 2017 study efforts to evaluate whether additional Performance Assurance provisions are needed within the energy and/or capacity markets to maintain operational reliability.

Competitive Entry Exemption for Increased CRIS

Currently, Class Year projects requesting to increase their CRIS are not eligible to request a Competitive Entry Exemption from buyer-side mitigation. This project would be to discuss with stakeholders effective eligibility rules for a Competitive Entry Exemption for projects that request increased CRIS.

Enhanced BSM Mitigation Study Period

This effort would involve continuing discussions with stakeholders to identify what, if any, enhancements can be made to the existing Mitigation Study Period and timelines used to evaluate projects, in order to result in enhanced determinations.

Review Capacity Physical Withholding Rules

This project involve reviewing the current physical withholding rules for the capacity market and discuss with stakeholders if the current rule set is still appropriate, or could be enhanced.

Winter CRIS Enhancements

Currently, the NYISO manually enters a percentage in the AMS each Winter Capability Period for all partially-deliverable units, and the AMS applies that percentage to the unit's Winter DMNC. The NYISO proposes to improve this manual process by maintaining fixed values for Winter CRIS in the AMS. Revisions to Attachment S of the OATT necessary to implement this project are part of the 2017 project re: Interconnection Process Improvements. This project involves software modifications to (1) modify the ICAP AMS to add a field for a fixed Winter CRIS value while maintaining historical Winter CRIS % in AMS; and (2) modify calculations inside AMS to use a fixed Winter CRIS value.

Payment for Locality Exports

This project would continue to address stakeholder comments on potential compensation for Generators with Locational Export Capacity noted in FERC's order, issued January 27, 2017, Docket No. ER17-446-000, accepting the Service Tariff rules for exports from Import Constrained Localities. The objective is to study whether an exporting resource for which an LEF applies should receive additional compensation, and, if necessary, work on a compensation mechanism for exporting resources for which an LEF applies.

CRIS Treatment for Exports

This project would continue discussions during 2017 as part of Locational Exchange Factors, reviewing stakeholder comments on whether modifications to the CRIS rules associated with Generators with Locational Export Capacity resources are appropriate. The objective is to study and, if necessary, modify the capacity market and planning processes in relation to capacity that is exported to neighboring Control Areas.

Capacity Transfer Rights for Internal Transmission Upgrades (SOM) [Future]

This project would 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 Rest of State and a Locality when private investors upgrade the AC transmission into a Locality.

Economically Allocate Import Rights [Future]

The Import Rights project would develop a market construct for awarding import rights rather than relying on the first-in-time, first–in-right approach.

DER Products

FERC Order No. 745 [Mandatory]

In March 2011, FERC issued Order No. 745 establishing a set of rules related to the compensation of demand response resources participating in wholesale energy markets. Order No. 745 required, among other things, that all ISOs and RTOs implement a monthly Net Benefits Test to determine the price at which demand response was cost effective, identify an appropriate cost allocation methodology for the costs associated with paying demand response, and propose changes to measurement and verification procedures as necessary.

The NYISO made an initial compliance filing on August 19, 2011. On May 16, 2013 FERC accepted, in part, and rejected, in part, the NYISO's 2011 compliance filing and required additional justification for certain of the 2011 compliance proposals. The NYISO submitted a request for rehearing of the Commission's rejection of NYISO's cost allocation methodology on June 17, 2013, and a second compliance filing on August 14, 2013. On January 30, 2017, FERC granted the request for rehearing and accepted the NYISO's justifications. The 2017 order accepted all tariff revisions in compliance with Order No. 745.

This project will implement the software and procedural changes necessary to implement the January 30, 2017 FERC order.

DER Participation Model [Mandatory]

The NYISO released its Distributed Energy Resource (DER) Roadmap in February 2017, as a first step to enhancing its market rules for DER participation in the NYISO's energy, ancillary

services, and capacity markets. The NYISO is also currently evaluating potential modifications to its existing Demand Response programs as part of this effort. This project will continue developing the market design concepts outlined in the Roadmap, and will develop the accompanying tariff revisions necessary to integrate this new DER participation model.

This project will include the design of DER performance obligations, metering and telemetry requirements, baseline and performance measurement and verification rules, resource modeling, and the development of an understanding of how to balance the simultaneous participation of DER in retail -level programs, as well as the NYISO's wholesale markets.

Granular Pricing & Market Price Delivery

The NYISO has proposed to publish a set of 5-minute nodal load prices to assist developers in identifying the appropriate location of DER and REV resources. This project will identify and map a set of appropriate transmission nodes whose prices, when published, will assist in that effort.

DER Pilot Framework

In conjunction with the development of the DER Participation Model, the NYISO will establish pilot projects to test new energy technologies. These projects, utilizing the framework established in 2017, will allow developers of new or emergent technologies and the NYISO to test the ability of those technologies to provide value to the wholesale market and learn about the technology's capabilities and uses. Pilot projects will also support REV demonstration efforts. The information learned through these pilot projects will ultimately allow the NYISO to develop DER market rules that appropriately incorporate new technology capabilities to meet grid needs.

Energy Market Products

Fuel Assurance - Constrained Fuel Supply Bidding (SOM) [Future]

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. Stakeholders recommended that the NYISO continue to pursue a Constrained Fuel Supply Bidding market design at the November 13, 2015 Business Issues Committee.

These designs would allow generators to submit bids subject to an inter-temporal constraint in the Day-Ahead Market. This concept was an SOM recommendation in 2013, 2014, and 2015. The premise behind this design 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 could 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.

Energy Storage Integration and Optimization

Continuation of the Energy Storage Integration and Optimization project aims to build upon concepts developed in 2017. The NYISO would more fully develop the energy storage participation model, associated market rules, and tariff language. Additionally, the NYISO would consider ways to improve the optimization of energy storage resources on a least cost basis by leveraging Energy Storage Resources' flexibility through more sophisticated energy constraint modeling.

Long Island PAR Optimization & Financial Rights (SOM) [Future]

The Long Island Phase Angle Regulators at Lake Success and Valley Stream are not currently optimized by the NYISO's market software. This can cause power to flow in an inefficient direction in the DA and RT markets. These PARs are owned by Con Edison and are currently used to meet local reliability criteria. A financial product must be created to allow Con Edison to derive revenue in exchange for optimization of these PARs. The market software/ processes must be modified to optimize the LI PARs and create the new financial product; this will minimize total production cost by ensuring power flows in the economic direction, as well as justly compensate Con Edison for the use of the PARs.

RTC-RTD Convergence Improvements (SOM)

The RTC-RTD Convergence Improvements Project seeks to better align RTC and RTD prices such that large deviations between the two corresponding market runs do not produce substantially diverging results. The inconsistencies between RTC and RTD may also contribute to transient shortage conditions and unnecessary price volatility. The NYISO seeks to eliminate unnecessary deviations between the two runs to ultimately result in better 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 2015 and 2016. 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 the actual PAR flows. 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 prices and schedules 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) [Future]

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 the generators filed with the New York State 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 Reasonably Available Control Technology (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 any resulting out-of-market costs result in uplift charges 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 crowdsout 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 MMU, steam units emit approximately 13 times more NOx per MWh than the newer generators with emission-reduction equipment. As part of this endeavor, the NYISO would discuss a review process for RACT compliance plans with impacted stakeholders.

Performance-based Reserve Payments (SOM) [Future]

Operating reserve providers are currently compensated the same regardless of whether they usually perform reliably in response to NYISO instructions. Consequently, the market does not

provide efficient performance incentives to generators that are frequently scheduled for reserves. To address these concerns, the NYISO would consider ways to base payments to reserve providers in past performance.

5-minute Transaction Scheduling

In 2011, the NYISO activated 15-minute transaction scheduling with Hydro Quebec at the Chateauguay Interface followed by all PJM proxy buses. This project would study the impacts of enhancing the real-time interchange scheduling processes by allowing economic scheduling of interchange across controllable interties every 5 minutes using the 5-minute Real-Time Dispatch (RTD).

15-minute Transaction Scheduling - IESO

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 developing 15-minute transaction scheduling concepts for the Ontario-NY Interface.

Model 100+kV Transmission Constraints (SOM)

Market incentives for investment in resources on the 115kV system in upstate New York may be 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 may have 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 may sometimes be inefficient. This project will assess the implementation of a methodology for managing certain 115kV transmission constraints in the day-ahead and real-time markets, including mitigation measures for resources that are committed or dispatched to manage these constraints.

Dynamic Reserve Requirements (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 thus removing the transmission constraint that necessitates the reserve region) rather than scheduling reserves on internal generation within the reserve region. This project would 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-contingency flows over the UPNY-SENY interface.

Constraint Specific Transmission Demand Curves (SOM)

The NYISO uses a graduated transmission constraint pricing mechanism to set prices during certain transmission shortages. However, some transmission shortages are still resolved by relaxation instead of by setting prices through use of a transmission demand curve. This project would study replacing the NYISO's current transmission constraint pricing methodology with

multiple transmission demand curves that can vary according to the importance, severity, and/or duration of the transmission constraint violation.

FERC Order 831: Offer Caps [Mandatory]

Differences in offer caps between regions may interfere with economic and reliability driven interchange scheduling. On November 17, 2016, FERC issued Order 831 on Offer Caps, specifying a soft cap of $1,000/MWh and a hard cap of $2,000/MWh. Offers above $1,000 are subject to cost verification. This project will modifty the market software to incorporate the methodology and Offer Cap rule changes outlined in the compliance filing submitted by NYISO.

Eliminate Fees for CTS Transactions with PJM (SOM) [Future]

CTS was introduced as a market design concept to improve scheduling of efficient transactions based on near real-time price information. The efficiency benefits of CTS with PJM have generally fallen short of expectations since it was implemented in the fourth quarter of 2014. The 2015 SOM report addresses this issue and makes the observation that there has been a 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 CTS with PJM can partially be attributed to the relatively large fees that are charged to transactions between NYISO and PJM, while no substantial transmission charges or uplift charges are charged to transactions between New York and New England. These charges present an economic barrier to achieving potential benefits from CTS at the PJM border. For this project, the NYISO will work with stakeholders and PJM to determine which, if any, fees can be eliminated.

Large Solar Participation Model

Large-scale solar installations are just beginning in the New York Control Area (NYCA). Solar technology can pose challenges to reliable grid operation due to its variable nature. The NYISO already contracts with solar forecasting entities to provide insight into the output from such resources. This project would examine how solar participation is modeled in the market and grid management software. As part of this endeavor, the NYISO will examine the need for solar forecasting by unit, similar to the current wind forecasting structure. Dispatchability requirements for large scale solar resources will also be considered.

Enhanced Fast Start Pricing (SOM) [Future]

Potomac recommends incorporating startup costs of gas turbines into LBMPs to allow gas turbines to be able to recover their costs through LBMPs. In addition, on December 15, 2016, FERC issued a Notice of Proposed Rulemaking (NOPR) on fast-start pricing in the RTO/ISO markets. The NYISO filed comments on this NOPR on February 28, 2017.

This project would investigate the impacts of incorporating startup costs from online GTs in LBMPs.

Pricing Reserves for Congestion Management (SOM) [Future]

The NYISO is required to maintain flows such that, if a contingency were to occur, no transmission facility would be loaded above its Long-Term Emergency (LTE) rating post-contingency. However, in some cases, the NYISO is allowed to use operating reserve capacity to satisfy this requirement. This allows the NYISO to increase utilization of the transmission system into load centers, thereby reducing production costs. Since such operating reserve providers are not compensated for helping manage congestion, the market may not provide efficient signals for investment in new and existing resources with flexible characteristics.

This project will study potential ways of improving market signals for resources that are providing congestion relief but are offline.

Mitigation Bid Transparency

As part of the NYISO's transparency initiative, this project would expand the current 90-day masked energy bid data to include the mitigated bids that were actually used in price formation.

Enterprise Products

Database Platform Upgrades Phase II [Continuing]

This is a continuation 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 the final phase of 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 V

This is 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) – 2018

This is a multi-year project to improve identity and access management (IAM) controls for cyber systems and physical facilities. The IAM 2018 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.

Application Testing Improvements Phase II

This project is a multi-year effort to reduce the cycle time and resources required to take ideas from concept to production release by increasing automation of the software build, deploy, test, and release processes. Bringing together process and technology enhancements will enable the NYISO to speed up and increase regression test coverage, reduce the time and effort required for data setup, and remove bottlenecks in the software delivery process. This phase will focus on enhancements to the application infrastructure to enable scaling of the solution delivery platform.

Finance Products

North Subzone Redistricting [Continuing]

This is a continuation of a 2017 Software Design Project (SDS). In 2008, NYPA and National Grid requested new sub-zonal boundaries in the North Zone in order to reduce Unaccounted For Energy (UFE). The 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 2017, the NYISO is completing a software design which will allow for changing the boundaries of subzones within zones systematically. The project will implement and deploy the subzone redistricting capability.

Transactions Modifications & Confirmation Tool

For validation of external transaction schedules, Customer Settlements staff currently use multiple forms that were originally developed to support the needs of Operations staff. These forms no longer provide the means for Customer Settlements staff to efficiently administer their validation process. This project would develop a tool that would allow the Customer Settlements department to efficiently administer the validation process.

CMS/ ConInvoice Data Integration

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

Expense Reports Automation [Continuing]

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.

Rate Schedule 12 Settlement [Continuing]

This project would implement settlements for Rate Schedule 12. It would allow for the NYISO's settlements systems to provide for cost recovery, consistent with Attachment S to the OATT, for the portion of a Highway System Deliverability Upgrade (SDU) not funded by contributing Class Year Developers.

CMS Projected True-up Exposure Enhancement

The NYISO modified its credit policy in 2015, to account for significant differences between a Market Participant's initial settlement and four-month true-up, which were primarily caused by Market Participants under forecasting load. These changes were made to the CMS in February 2015. In 2017, the NYISO performed additional analysis to identify potential areas of improvement whereby the credit requirement better aligns to market risk. This project would implement those enhancements and revise the tariff accordingly.

FERC Form1 Redesign

This project will procure and install or will create a utility to enter and submit data in a new electronic format as being prescribed by FERC and NAESB. This financial data is currently provided to FERC using FERC's online Form 1 and is supplied quarterly and annually.

Vendor Management Tool

The NYISO's Procurement Department manually maintains data on procurement activity for over 1,000 vendors and several thousand contracts,agreements, and tax documents that are used to support approximately 800 annual procurement events. The primary goal of this project is the creation of a single database, with query/ reporting capabilities, to house all vendor and contract information. This database would facilitate vendor management, minimize errors, and increase organizational efficiency. Successful implementation would further enable the Procurement Department to replace several manual processes, and to better support current initiatives such as tactical vendor management and strategic sourcing.

Operations & Reliability Products

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 project is a continuation of prior year efforts.

TOA Platform Upgrade Phase II [Continuing]

This project continues the efforts started in 2016 to upgrade the NYISO's outage scheduling application, classic TOA. Currently, the NYISO is one of the few remaining customers on the classic TOA platform, which reduces our ability to implement new functionality and increases concern of supportability. Classic TOA is being upgraded in multiple phases as the current platform is nearing end-of-life and the vendor is migrating its customers to its new platform, iTOA.

2017 Reference Level Software Enhancements [Continuing]

This project will address improvements to the documentation of the Reference Level Software (RLS) application as well as several functional enhancements to the RLS software. Some functional enhancements include allowing multiple fuels for a single reference and improved screen refreshes.

PI System Upgrade [Continuing]

The PI Server currently in production is not compatible with the new version of EMS/BMS software that the NYISO is implementing as part of the multi-year EMS/BMS Upgrade Project. The PI System Upgrade project will update PI Server to a version compatible with the new EMS/BMS platform, and will be performed in conjunction with the EMS/BMS Upgrade testing and deployment. In addition, the new version of PI Server will result in decreased database licensing costs and improved maintainability and reliability.

EMS/BMS Workstation Upgrade [Continuing]

As part of the EMS/BMS upgrade project, NYISO must deploy new operator workstations that host the Network Manager (NM) platform in the control room and to run the Day-Ahead Market. The new workstations are being setup to support parallel execution of the markets in the NM-R and NM environments until we switch over to the NM platform. The scope of this project is to add new NM workstations and update the ESX cluster in place, which will run both Ranger and NM virtual workstations. This upgrade is required to be completed before the NM deployment, but purchasing, system builds, and configuration will take place in 2018.

Gurobi (MIP) Hardware Refresh [Continuing]

The Ranger performance project procured a cluster of x86 servers in 2012 to run the Gurobi compute engine for MIP. That hardware will reach end of life in Q1 of 2020. A refresh of that hardware needs to occur before then. With a new Linux environment being introduced into production as part of the EMS BMS project, there is a potential to reduce hardware and software costs by leveraging the new platform. The deployment of new servers should coincide with the rollout of the EMS BMS production hardware in Q1 2019.

Gurobi (MIP) Software Upgrade [Continuing]

The math engine responsible for solving the unit commitment and dispatch optimization for Ranger and the EMS BMS upgrade is a commercial product called Gurobi. Major releases of this product occur every two years and mainline support rolls off for a particular release after about

four years. The version currently used in production is Gurobi 5.6 and it is on extended support, resulting in higher maintenance fees to the vendor. Gurobi 7.0 is the current version and offers improved performance and resiliency features. This project is to upgrade to the current version of Gurobi in production and in the new NM environment.

Load Forecaster Upgrade & Buildout

The NYISO's current Load Forecaster application, MetrixIDR Version 5.3.2.268, and its computational engine, MetrixND Version 4.5.68, are supplied by Itron, Inc. Itron notified the NYISO in October 2016 that they will be releasing a new verison of MetrixIDR, expected in October 2017. The newest version of MetrixND, 4.7, was released in October 2016. The current version of IDR in operation at the NYISO will no longer be supported by Itron after December 2018. To put these two related products in context, MetrixND contains the statistical software that is used to estimate all forecast models used in production. MetrixIDR is the dynamic system that receives data inputs and generates forecasts in real time for Grid Operations and Market Operation.

Itron has a dedicated software development team working on enhancing MetrixIDR to meet the requirements of a global customer community. In order to mitigate risk and enhance the NYISO's load forecasting capabilities, this project would upgrade the NYISO's current version with the new release of MetrixIDR.

In addition, this project will build out the QA Integration 1 environment, which currently lacks the ability to perform testing on MetrixIDR. An additional client license for MetrixIDR will most likely be needed for INT-1.

The objective of this project is threefold: to upgrade MetrixIDR and MetrixND, and to build out the INT-1 environment.

Planning Products

Interconnection Project Queue (or Portal) Automation

The NYISO's Interconnection Projects team currently uses a manual process to manage both the receipt of Interconnection Project requests and management of the Interconnection Projects queue. Due to recent changes in energy markets and the business environment, the NYISO is experiencing a sustained increase in the number of Interconnection Project requests received.

Other ISOs/RTOs are currently using interconnection portals to manage their interconnection processes. The NYISO's Planning department would like to implement similar processes in order to alleviate work load on internal resources and improve customer service for Market Participants that request interconnection services.

Transmission Planning Process Review

The purpose of this project is to review the NYISO's separate transmission planning processes and consider whether it may be beneficial to revise and/or further integrate the reliability, economic, and public policy planning processes.

Model-on-Demand Upgrade and Build-Out

Siemens PTI Model-on-Demand (MOD) and associated Web Portal are used by the NYISO and the NY TOs to update and maintain the network model. MOD was last updated in 2013 and in order to maintain support and take advantage of new capabilities, the NYISO would like to upgrade the application to a newer version. As part of this effort, NYISO would build out an additional environment to test the upgrade prior to going into our staging and production environments.

TCC Products