2020 Enterprise Project Candidates

Product and Project Management

5/29/19

This document represents potential 2020 Enterprise project candidates. Enterprise projects are internal-facing technology and back office support projects that have no market rule changes. These project candidates and their corresponding descriptions reflect information known about each of the project candidates as of the date of this document.

Table of Contents

Introduction

This document represents potential 2020 Enterprise project candidates. Enterprise projects include internal-facing technology and back office support projects that have no market rule changes. The list includes projects that may be noticeable to Market Participants. These project candidates and their corresponding descriptions reflect information known about each of the project candidates as of the date of this document. Projects are classified as four project types.

Project Type	Description
Mandatory	Strategic Initiatives and FERC Orders. These projects will be included in the budget
Continuing	Approved in a prior year and have progressed to either software design or development complete. Additional projects may be classified as Continuing based on stakeholder feedback. These projects will be included in the budget
Future	Consensus from stakeholder discussions of this projects priority relative to other projects has resulted in these projects NOT being prioritized and initiated in the coming budget year. Resources, time constraints, stakeholder feedback, and other project dependencies have been taken in to consideration
Prioritize	Projects to be prioritized and included in the budget based on a feasibility assessment taking into consideration resources, time constraints, stakeholder feedback, priority score, and other project dependencies. Market projects are included in the stakeholder survey

Enterprise projects are NOT included in the stakeholder survey. Enterprise projects that are Prioritize (not Mandatory, Continuing, or Future) are scored by the NYISO during the prioritization phase. These projects are included in the budget based on a feasibility assessment taking into consideration resources, time constraints, stakeholder feedback, priority score, and other project dependencies. The table that follows identifies project type for each of the projects included in this document.

Project Name	Product Area	Project Type
Budgeting Tool	Business and Finance Products	Prioritize
CMS and ConInvoice Data Integration	Business and Finance Products	Prioritize
CMS Minimum Participation Criteria Enhancements	Business and Finance Products	Prioritize
Customer Relationship Management (Salesforce CRM) Enhancements	Business and Finance Products	Prioritize
Enterprise Information Management - Data Integration Phase IV	Business and Finance Products	Continuing
FERC Form1 Redesign	Business and Finance Products	Mandatory
Finance Reporting and BVA Automation	Business and Finance Products	Prioritize
Financial Risk Assessment and Scoring Enhancement	Business and Finance Products	Continuing
Minimum Oil Burn Enhancements	Business and Finance Products	Prioritize
Oracle Financials Upgrade	Business and Finance Products	Continuing
Position Control System	Business and Finance Products	Continuing
Rate Schedule 12 Settlement	Business and Finance Products	Continuing
SDX API Pilot	Business and Finance Products	Prioritize
Station Power Platform Enhancement	Business and Finance Products	Prioritize
Transactions Modifications and Confirmation Tool	Business and Finance Products	Prioritize
Vendor Management Tool	Business and Finance Products	Continuing
DAM Congestion Settlement Re-Allocation	Energy Market Products	Prioritize
Energy Market Software Performance	Energy Market Products	Prioritize
Access Management	Enterprise Products	Prioritize
Advanced Test Automation	Enterprise Products	Prioritize
Application Platform Upgrade - 2020	Enterprise Products	Continuing
CIP Program Optimization and New Standards Development	Enterprise Products	Prioritize
Database Upgrade and Platform Migration	Enterprise Products	Continuing
IT Infrastructure Automation	Enterprise Products	Continuing
IT Service Management Improvements	Enterprise Products	Prioritize
Market Information Systems Modernization	Enterprise Products	Prioritize
Network Infrastructure Upgrade	Enterprise Products	Continuing
PCC Control Room Enhancements	Enterprise Products	Prioritize
Automated Default Bid Mitigation	Operations & Reliability Products	Continuing
EMS Visualization Native PI Viewer - Interface and Event Tool	Operations & Reliability Products	Prioritize
EMS/BMS Operational Enhancements	Operations & Reliability Products	Prioritize
E-Tagging Refresh and Performance Improvements	Operations & Reliability Products	Prioritize
GFER Upgrade	Operations & Reliability Products	Prioritize
Grid Guardian Network Topology Feature Implementation	Operations & Reliability Products	Prioritize
NextEra Transmission Owner Integration	Operations & Reliability Products	Mandatory
Transmission and Generation Scheduling System (TAGSS)	Operations & Reliability Products	Continuing
TCC Auction Billing	TCC Products	Prioritize

Business and Finance Products

1   Budgeting Tool

The NYISO currently builds its annual budget through a manual process using Microsoft Excel. Files are shared among NYISO staff through email and network distribution methods, resulting in a manual workflow and process. This project would implement a more automated and integrated system for budget development and management. The NYISO expects that automating portions of the budget development and management process could lead to reduced time and effort required to develop and manage the budget, and potentially provide additional opportunity to identify cost savings measures in order to more effectively service the entire organization and its stakeholders.

2   CMS and ConInvoice Data Integration

Finance manages a number of processes to manually update collateral, prepayments, and Market Participant transfers and refunds within the Credit Management System (CMS) and the Consolidated Invoice system (ConInvoice). This project would provide an automated solution to link CMS and ConInvoice, eliminating the need for manual data input by the Accounting and Credit departments.

Automating product integration will result in increased accuracy in both systems and a reduction in manual and redundant work efforts.

3   CMS Minimum Participation Criteria Enhancements

All Market Participants are required to meet Minimum Participation Criteria in order to participate in any of the NYISO Markets. These requirements include, but are not limited to, officer certification, capitalization, financial statement reporting, and Market Participant risk policies and procedures.

This project will automate the CMS to track receipt of the officer certification forms and capitalization by all Market Participants.

4 Customer Relationship Management (Salesforce CRM) Enhancements

This project will enhance the Customer Relationship Management tool, which the NYISO implemented in Salesforce in 2017 and uses to manage customer registration and communication. The project will allow for improved use of the Salesforce CRM tool and increase process efficiencies, thus providing improved opportunities for customer service.

The project will allow for the NYISO Stakeholder Services and Member Relations departments to more effectively serve NYISO customers. The project will provide efficiency in processing Market Registration data and customer inquiries, while maintaining high levels of customer service.

5 Enterprise Information Management – Data Integration Phase IV

This project is a continuation of the 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 migrate the Customer Settlements Data Mart to a new platform and architecture, positioning the NYISO to upgrade the Oracle database to the latest version and to retire Oracle Warehouse Builder.

6 FERC Form 1 Redesign

This project will procure and install, or will create, a utility to enter and submit FERC Form 1 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. Currently this is a 2019 project but the NAESB standards have not yet been released. This delay moves the projected deliverable into the 2020 projects timeframe.

7 Financial Reporting and BVA Automation

Some of the current processes for creating certain financial reports, including budget vs. actual comparisons, require the manual manipulation of spreadsheets. The project will identify data captured during the budgeting process to determine what contents and specifications a

centralized data repository dedicated to financial reporting would need to include in order to satisfy the business needs of the NYISO's Finance department to make the finance reporting process more efficient.

8 Financial Risk Assessment and Scoring Enhancement

There are currently a number of manual processes being utilized in the NYISO financial risk assessment process to evaluate each Market Participant's potential risk exposure. This project, which was started in 2019 with functional requirements, will develop and deploy the additional functionality, including reporting, for the NYISO's automated financial risk assessment process. It will also provide for automation of the NYISO Credit Scoring Model. These updates are intended to increase efficiencies in identifying and mitigating credit risk.

9 Minimum Oil Burn Enhancements

The NYISO Minimum Oil Burn program and procedures establish fuel switching requirements at certain cold weather thresholds to secure electric reliability in the event of gas pipeline contingencies. The current program involves several manual processes to facilitate user registration, as well as modification of associated program cost and rates. This project will automate manual processes and streamline the min oil burn rate registration and updates of the current cost and rates.

10 Oracle Financials Upgrade

The NYISO relies on Oracle E-Business Suite (EBS) for its accounting and financial reporting functions. Oracle has announced that support for the version of EBS currently in use at the NYISO will end on 12/31/2021. In order to continue using a supported version of EBS, the NYISO must upgrade to a newer version of the product before that date. This will ensure that security patching, service packs, enhancements, and access to product support remain available.

11 Position Control System

The Human Resources (HR) department is responsible for managing all of the positions within NYISO, both filled and unfilled, for accurate budget and headcount purposes. Currently, there are labor intensive, manual processes used to track all of the information regarding these positions. This project would identify, procure, and deploy a Position Control System, which

would track actual staffing levels and costs over time, enabling more efficient vacancy tracking and staffing and salary budgeting.

12 Rate Schedule 12 Settlement

This project will implement settlements for Rate Schedule 12 to 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. The NYISO began this project in 2017 by developing the functional requirements and is scheduled to deploy the initial functionality in 2019. This 2020 project would complete the functionality needed for settling under Rate Schedule 12 per the NYISO tariff.

13 SDX API Pilot

This project will focus on improving Market Participant interaction with the NYISO Settlements system. Specifically, it will reassess the current file-based upload/down methodology for daily reconciliation, metering, minimum oil burn event, and station services. This project will create and leverage a pilot test environment that supports industry standard RESTful API that seeks to replace the current file-based data exchange templates. The pilot environment will allow market participants to gain knowledge and provide feedback about the new capabilities.

14 Station Power Platform Enhancement

The NYISO Station Power program allows for eligible Market Participants to recover costs (e.g. thermal generation, office lights, and equipment, etc.) associated with energy used by a generator for operating electric equipment located on the generation site, or portions thereof, owned by the same entity that owns the generator.

These invoicing system calculations are performed in the final stages of the invoicing process and often incur manual reviews as metering data is trued up in the system. A redesign of the process to calculate the monthly netting of the station service load as a pre-processing step to the daily-level Settlements process will provide additional lead time in identifying metering issues and reduce manual invoicing review times.

15 Transaction Modifications and Confirmation Tool

This project will develop a tool for the Operations and Customer Settlements departments to assist in the validation of external transaction schedules. Following the implementation of 15-minute and CTS scheduling protocols, existing forms require a redesign to streamline use and increase efficiencies within Operations to allow for continued prioritization of transactions for operational purposes. Additionally, Customer Settlements staff use multiple forms that were originally developed to support the needs of Operations staff. Customer Settlements forms require modifications to provide the means to efficiently administer the necessary economic validation process of transaction adjustments.

16 Vendor Management Tool

The NYISO's Procurement department manually maintains data on procurement activity for over 1,000 vendors and several thousand contracts/ agreements/ 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 tool would facilitate vendor management, minimize errors, and increase organizational efficiency. This project is a continuation of 2018 and 2019 efforts, with solution implementation in 2020.

Energy Market Products

17 DAM Congestion Settlement Re-Allocation

The NYISO has a robust set of procedures and tools for performing the monthly DAM Congestion settlements specified in Attachment N of the OATT. A portion of this process is supported by outdated software that was developed in 2007 by an outside vendor. Maintaining this externally-developed code is difficult and time-consuming and does not comport with the NYISO's IT application management process and standards. Creating an in-house automated replacement will improve application security and data integrity, ease of use, reliability of results, and improve the NYISO's ability to keep the underlying technologies of the application current.

An automated and improved DAM Congestion Settlement Re-Allocation process would also improve the reliability of its calculations by reducing the need of ad-hoc adjustments.

18 Energy Market Software Performance

The EMS/BMS hardware upgrade will be deployed in 2019, providing a new platform for the market software that is expected to provide significant performance benefits. However, the NYISO has completed a number of complex market design efforts since the EMS/BMS project was initiated. Recent prototyping efforts by the NYISO and its vendors indicate that solve times will be unachievable in the future as market design and resource mix become more complex. This project will study opportunities to enhance market solution efficiency and will provide more information to the NYISO and its stakeholders about the benefits of potential enhancements.

The 2020 deliverable for this project will be Study Complete. The study should determine promising methods to increase energy market software performance. This study could include simulations to test modeling improvements that result in reduced solve time, as well as discussions and follow up analysis with internal NYISO resources to determine data processing approaches that result in less processing time in preparing data for the energy market software and processing the market results.

This project was previously requested by Market Participants in response to the finding that two market design projects that will be deployed in the near future may increase Day Ahead (DA) market solve time. The NYISO is also aware that future energy market design projects may increase the solve time of the Day Ahead market and Real Time market in addition to those already planned.

This effort could reveal methods to decrease the amount of time required for the energy market software process, allowing for future advancements in energy market design. Such methods could also allow the NYISO to maintain the current DA posting time, even with improvements in the energy market design. This project will allow the NYISO to continue with energy market design innovations into the future.

Enterprise Products

19 Access Management

This project will continue to improve access management (AM) controls for cyber systems and physical facilities. The AM 2020 project builds upon the completed deliverables from earlier AM project phases. This phase seeks to further extend automated provisioning capabilities and implement infrastructure upgrades for enhanced security and improved system availability.

20 Advanced Test Automation

This project is a multi-year effort for the NYISO to meet the challenge to continuously maintain and improve the quality and efficiency of software systems testing. Production releases at the NYISO introduce increased complexity in development and testing efforts and require manual testing. Test automation is an effective method to gain efficiencies while increasing testing effectiveness.   This project seeks to automate test scripts and to provide significant test automation for multiple NYISO applications.

21 Application Platform Upgrade – 2020

This project is a continuation of a multi-year effort to replace aging server infrastructure and migrate to a new application platform standard. This technology lifecycle project is necessary to ensure the ongoing availability of security patches and vendor support for critical systems.

22 CIP Program Optimization and New Standards Development

The NYISO must continue to advance cyber security risk management capabilities with a goal to increase process efficiency supporting NERC Critical Infrastructure Protection (CIP) compliance. An effective and efficient compliance program requires the time, expertise, and coordination of multi-department teams, as well as the organizational commitment facilitated through the enterprise project management processes. This project will seek opportunities to improve CIP compliance requirements through risk management, process redesign, and reduction of manual activities, while also keeping pace with the design and implementation of emerging regulatory requirements.

23 Database Upgrade and Platform Migration

This project is a continuation of a multi-year effort to upgrade the NYISO's database systems and to begin migration to a new hardware platform 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.

24 IT Infrastructure Automation

This project is a continuation of a multi-year effort to support the implementation of tools and processes to automate a number of infrastructure management functions that support critical systems.

25 IT Service Management Improvements

IT Service Management (ITSM) refers to the activities performed to design, plan, deliver, operate, and control the IT services offered to the NYISO business. A properly implemented ITSM solution increases the speed, cost-efficiency, and effectiveness of IT services, reduces and helps prevent IT incidents, enables employees to be more productive, and reduces risk by enforcing compliance regulations. This project aims to replace NYISO's legacy ITSM tool, which is approaching its end-of-support date, with a modern solution that will provide these benefits and continue to support NYISO's SOC 1 controls and NERC CIP requirements.

26 Market Information Systems Modernization

This project is part of a multi-year effort to evolve the NYISO's bid-to-bill (exclusive of the EMS/BMS) architecture to meet the needs of the Distributed Energy Resources Participation Model and position the NYISO to be more responsive to the emerging business needs described in the 2018 Master Plan and the 2019-2023 Strategic Plan.

27 Network Infrastructure Upgrade

This project is the final phase of a multi-year project to replace and/or upgrade network infrastructure components. This technology lifecycle project is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

28 PCC Control Room Enhancements

The NYISO is proposing a multi-year project to renovate the Alternate Control Room located at the Carman Road facility in Guilderland. The primary business driver for this project is the need to eliminate the functional differences between NYISO's Primary and Alternate Control Rooms.

The Primary Control Room, located at the Krey Blvd facility in Rensselaer, went on-line in November, 2013. This Control Room has state-of-the-art monitoring tools and situational awareness displays including a Video Display Wall. In addition, the Operations staff is strategically placed on the Control Room floor to most effectively facilitate critical communications. After five years of operating in the new Control Room, NYISO Operations staff depend on the enhanced tools and staff configuration to most efficiently operate the Bulk Electric System.

When Operational Control is moved to the Alternate Control Room, the functional differences between the two Control Rooms can present some challenges to NYISO's Operations Staff. Commissioned in 1969, the Alternate Control Room utilizes technology and systems from that era that are significantly different from today's state-of-the-art systems. This project will eliminate the functional differences between the two Control Rooms. The result will be the same monitoring tools, situational awareness displays, and lines of communication in both Control Rooms.

Operations & Reliability Products

29 Automated Default Bid Mitigation

Once a generator has failed both a conduct and impact test for withholding, it may be subject to mitigation. Currently, there is no software to systematically enforce the mitigation. This project seeks to implement automated software changes to ensure that when mitigated, a generator's bids will conform to the Tariff rules for Default Bid Mitigation.

This will reduce the potential of generators exercising market power and help ensure that the protections in the NYISO's tariffs are properly enforced.

30 EMS Visualization Native PI Viewer – Interface and Event Tool

The NYISO currently uses remote virtual machines (VMs) to manipulate and render PI displays for screen scraping to the video wall. Through feedback provided by the NYISO in 2013-2014, the video wall vendor has created an add-on to their product which allows native rendering, manipulation, and automation of PI displays. This feature will remove the need for additional

VMs and the associated cumbersome user interaction for Operations as well as provide opportunities for faster PI display call-ups in response to system conditions and events.

This project will improve the NYISO's system operations efficiency and situational awareness.

31 EMS/BMS Operational Enhancements

The NYISO is completing a multi-year project in 2019 to upgrade both the Energy Management System (EMS) and the Business Management System (BMS). The EMS encompasses the core reliability functions used by the system operators such as load flow and contingency analysis. The BMS encompasses the day ahead and real time energy market functionality. As the NYISO prepares for the 2019 deployment and gains expertise on the new system, it is expected that additional functional enhancements will be identified to implement as post go-live changes in 2020.

This project seeks to implement enhancements to the EMS/BMS systems that were identified during the 2019 EMS/BMS upgrade.

This project ensures that the NYISO has an optimal solution for the critical business functions of system reliability and energy market management.

32 E-Tagging Refresh and Performance Improvements

The NYISO E-Tagging software is a custom application designed to provide Market Participants and other control areas with greater visibility into the NYISO's marketplace data in relation to corresponding E-Tags. The software provides automated integration with the OATI E-Tagging authority for responding to E-Tag requests and updating E-Tags to reflect NYISO schedules.

This project will update the software to improve performance and prepare for expandability to support future scheduling initiatives. This project will improve the NYISO's ability to integrate new functionality and make the system more robust.

33 GFER Upgrade

The NYISO Generator Fuel and Emissions Reporting (GFER) software is a custom application designed for Market Participants to submit fuel and emissions information to the NYISO, which

gives the NYISO more visibility into the fuel availability and emissions limitations of the NY generation fleet.

This project will update the software to improve usability, efficiency, and maintainability of the application. This project will improve the NYISO's ability to integrate new functionality and make the system more robust.

34 Grid Guardian Network Topology Feature Implementation

The Primate EMS Visualization software currently provides redundancy to the EMS through the use of Phase 1 metering. Network topology is not currently able to be supported independently, should the EMS become unavailable. The purpose of this project is to implement Primate's Grid Resiliency product which allows network topology to be entered and reflected on Primate displays during periods of EMS unavailability. Additionally, displays will be updated with latitude/longitude information to allow geographic alarming.

This project improves the NYISO's system operations situational awareness during periods of EMS system unavailability.

35 NextEra Transmission Owner Integration

The NYISO recently approved the Empire State Line proposal by NextEra Energy to build a new 345 kV transmission line and switchyard in Zone A in Western NY, plus upgrades and expansions to existing transmission facilities. The project is planned to be in service by June, 2022. As a result of the expansion, NextEra will become a Transmission Owner/Operator within the NYISO footprint. This project will consist of component research and requirements definition in 2020 to expand systems and protocols to accommodate the NextEra integration to meet the project in-service date.

36 Transmission and Generation Scheduling System (TAGSS)

The NYISO currently uses applications developed by a third party—TOA (Transmission Outage Application) and iTOA (latest version of the TOA software)—for transmission and generation outage scheduling. TOA is used internally to facilitate coordination of NYISO approval of

2019 The New York Independent System Operator, Inc. All Rights Reserved.	
	Page 16 of 17

transmission and generator outages requested by TOs (Transmission Owner) and GOs (Generation Owner) and iTOA is the external interface used by GOs and TOs. The dated platform of TOA and iTOA presents a growing technical risk to the NYISO and limits the NYISO's ability to implement new functionality.

The Transmission and Generation Scheduling System (TAGSS), a software application that the NYISO began developing with a third party vendor in 2018, is the replacement for TOA and iTOA based on a modern technology stack. The NYISO is continuing to develop the application in 2019 and expects to select a vendor partner to accelerate development of the application in 2020 with anticipated completion in 2021.

TCC Products

37 TCC Auction Billing

Current billing for TCC Auctions is performed outside of the formal NYISO invoicing process by the NYISO Accounting department using excel spreadsheets. TCC Auction billing cycles do not align with the invoicing process and timelines associated with other NYISO market transactions. In addition, billing outside of the NYISO invoicing process prevents Market Participants from paying TCC charges using the standard Automated Clearing House (ACH) network.

This project will incorporate TCC Auction billing into the existing NYISO invoicing processes and systems and align with current NYISO weekly and monthly invoicing cycles.

This project will eliminate manual processing associated with TCC Auction billing, enhance processing of auction results through the formal NYISO Bid to Bill process, and facilitate ACH payments for TCC Auctions for Market Participants.