2022 Enterprise Project Candidates

Product and Project Management

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(No changes from May 27, 2021 version)

This document represents potential 2022 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.

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Introduction

This document represents potential 2022 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	Projects approved in a prior year and that have progressed to either Software Design, Development Complete, or Deployment will generally be proposed as Continuing. 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 into 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

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.

Item	Project Name	Product Area	Project Type
1	ACC Control Room Renovations	Enterprise	Continuing
2	Application Platform Upgrade	Enterprise	Continuing
3	Database Upgrade	Enterprise	Continuing
4	EMS/BMS Operational Enhancements	Operations & Reliability	Continuing
5	IT Infrastructure Automation	Enterprise	Continuing
6	ITSM Security Enhancements	Enterprise	Continuing
7	Network Infrastructure Upgrade	Enterprise	Continuing
8	Outage Management System (OMS)	Operations & Reliability	Continuing
9	UPS Replacement	Enterprise	Continuing
10	Windows System Upgrade	Enterprise	Continuing
11	ASIS Rule for Re-write - Validating Exports	Energy Market	Prioritize
12	BMS Performance Certification	Enterprise	Prioritize
13	BTM Solar Demand Forecasting Product Enhancements	Planning	Prioritize
14	Business Entity and Credit Questionnaire Enhancements	Business & Finance	Prioritize
15	CMS and ConInvoice Data Integration	Business & Finance	Prioritize
16	Content Management and Collaboration Solution	Enterprise	Prioritize
17	Contingency Analysis Results for Transmision Owner Situational Awareness	Operations & Reliability	Prioritize
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26	Market Validation, Reporting and Penalty Enhancements	Capacity Market	Prioritize
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28	Microsoft 365	Enterprise	Prioritize
29	Minimum Oil Burn Enhancements	Business & Finance	Prioritize
30	Natural Gas Notices Enhancement Project	Operations & Reliability	Prioritize
31	NetBackup Appliance Refresh	Enterprise	Prioritize
32	Next Generation Test Environment Study	Enterprise	Prioritize
33	NYISO Hosted Siemens Cloud	Planning	Prioritize
34	On-Boarding of New Resources	New Resource	Prioritize
35	Outage States Portal/Dashboard	Capacity Market	Prioritize
36	PI Tools Upgrade	Operations & Reliability	Prioritize
37	Price Validation Technology Upgrades	Enterprise	Prioritize
38	Privilege Access Management Upgrade and Enhancements	Enterprise	Prioritize
39	Salesforce CRM Optimization	Business & Finance	Prioritize

40	SDDB Steady State Dynamics Database MP Portal	Planning	Prioritize
41	System Demand End Use and Electrification Forecasting Enhancements	Planning	Prioritize
42	Transactions Modifications and Confirmation Tool	Business & Finance	Prioritize
43	Unified Communications Platform	Enterprise	Prioritize
44	Web Content Management System Upgrade	Enterprise	Prioritize

Continuing

1 ACC Control Room Renovations

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 Boulevard 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 one-hundred cube Video Display Wall. In addition, the Operations' staff is strategically placed on the Control Room floor to most effectively facilitate critical communications. After eight 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 at Carman Road, 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.

The project started in 2020 and was scheduled to be completed over two years. However, due to the COVID19 pandemic, the planned 2020 efforts were postponed and the project was put on hold. The NYISO plans to restart the project and complete it in 2022, in advance of the Uninterruptible Power Supply (UPS) System Replacement at Krey Boulevard as primary control room operations will be performed out of the Carman Road facility while the UPS is being replaced at Krey.

Once this project is complete, the functional differences between the NYISO's Primary and Alternate Control Rooms will be eliminated. This will mitigate the Operational Risks currently present due to these functional differences.

2 Application Platform Upgrade

In order to keep the NYISO markets running smoothly and operate the electrical grid reliably, the underlying application platform infrastructure must be upgraded periodically to ensure the ongoing availability of security patches and vendor support for critical

systems. Additionally, software vendors release new features in new application platform versions that the NYISO can often utilize to improve the overall performance, support, and maintenance of applications used in the running of the NYISO markets. This project is a continuation of a multi-year effort to replace aging application platform 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.

3 Database Upgrade

In order to keep the NYISO markets running smoothly and operate the electrical grid reliably, the underlying databases must be upgraded periodically to ensure the ongoing availability of security patches and vendor support for critical systems. Additionally, software vendors release new features in new database versions that the NYISO can often utilize to improve the overall performance, support, and maintenance of databases and applications that use them. This project is a continuation of a multi-year effort to upgrade the NYISO's database systems to the latest Oracle version 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.

4 EMS/BMS Operational Enhancements

The NYISO completed a multi-year project in 2020 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. In 2020, the NYISO kicked off the multi-year, EMS/BMS Operational Enhancements Project to implement additional functional enhancements identified as post go-live changes. This project is a continuation of this effort.

5 IT Infrastructure Automation

The focus of this continuing, multi-year effort is on increasing automation of various IT management activities. By enhancing the NYISO infrastructure with supporting processes and current and prospective tools, the NYISO will be increasingly responsive in supporting the frequency of change required by the business. Automation of activities, such as patching and upgrade processes, will also serve to improve the NYISO's security posture while reducing business impact of services.

6 ITSM Security Enhancements

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. Cyber security threats continue to grow and become more sophisticated, requiring NYISO to rely on tools and processes to protect its IT assets and services. This project is a continuation of a multi-year effort to replace NYISO's legacy ITSM tool with a modern solution that will provide these benefits and continue to support NYISO's SOC 1 controls and North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) requirements. This project will automate current manual processes and provide confidence that all NYISO IT assets and services are monitored and protected from cyber security risks.

7 Network Infrastructure Upgrade

The NYISO network infrastructure includes many different components that are critical to delivering networking services to NYISO end-users, business units, and external customers. Such components include key infrastructure such as switches, routers, firewalls, and other network devices that interconnect and protect our systems. All of these components require active vendor support to provide 24x7 assistance and to receive necessary updates to protect from vulnerabilities. A number of the NYISO's network infrastructure components are entering the vendor-mandated end-of-life state. As a result, the NYISO will no longer receive necessary security patches to mitigate new cyber risks and/or software bugs once that threshold has been passed.

Given the critical importance of this infrastructure, it is necessary to maintain vendor support for these key components in order to receive updates, patches, and on-going maintenance. This project is a continuation of a multi-year effort to continue replacing outdated hardware with the objective of providing secure service delivery while modernizing and streamlining the NYISO's data centers in accordance with current industry best practices and vendor recommendations.

8 Outage Management System (OMS)

The NYISO currently runs applications developed by a third-party vendor—TOA (Transmission Outage Application) and the iTOA (latest version of the TOA software)–for transmission and generation outage scheduling. TOA is only used internally to facilitate coordination of transmission and generator outages requested by TOs (Transmission

Owner) and GOs (Generation Owner), and outage reporting. iTOA, an interface used by GOs and TOs, is used externally only.

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. In 2020, the NYISO conducted a Request for Proposal process and selected a new vendor to replace the applications as part of Transmission and Generation Scheduling System (TAGSS) project. The new application, Outage Management System (OMS), utilizes a modern technology stack that is hosted in the vendor's data center, and will reduce the risk with implementing new functionality in the future. The NYISO commenced implementation of the OMS in Q4 2020 and expects to complete replacement of TOA and iTOA applications with OMS in 2022.

9 UPS Replacement

The NYISO is proposing a multi-year project to replace the two Uninterruptible Power Supply (UPS) Systems located at the Krey Boulevard facility in Rensselaer. These UPS systems provide "clean" power (i.e. power which is free of electrical noise and voltage spikes and drops) to all mission critical loads including the Primary Control Room and Data Center.

To provide full redundancy, the systems are in a 2N configuration, meaning that the each unit individually can support all mission critical equipment. Therefore, if one unit is taken out of service for whatever reason, the second unit can serve the full mission critical electric load.

The existing UPS systems were installed in 2006 when NYISO first moved into the building at 10 Krey Boulevard. In 2022, the units will be sixteen (16) years old, end-of-life, and will require replacement. In addition, NYISO has been notified that the manufacturer will no longer be able to support these systems after March 2023. While the UPS is being replaced at Krey Boulevard, primary control room operations will be performed out of the Carman Road facility. By having the ACC Renovations project completed, NYISO Operations can operate from the ACC for the 2-3 month duration of the UPS Replacement to be completed by March 2023.

10 Windows System Upgrade

This project is a multi-year effort to upgrade NYISO's aging Windows Systems. Virtually all employees and contractors to perform their job responsibilities on a daily basis use NYISO laptops and desktops. Corporate Control Room desktops are required to support the daily responsibilities of the Operators. Given the age of the existing fleet of laptops

and desktops, it is expected they will fail at an increasing rate, making the need for vendor support a high priority. Included in the effort will be the replacement of NYISO laptops and corporate Control Room desktops that have reached end-of-life (out of warranty support starting in October 2020). This technology lifecycle project is necessary to maintain system performance and availability, as well as ensure ongoing vendor support for critical systems.

Prioritize

11 ASIS Rule Re-write – Validating Exports

The NYISO Market Validation (MV) team utilizes software to validate the wholesale energy market outcomes produced by the Energy Management System. The MV team has requested enhancements to the rules that validates export transactions were scheduled appropriately in the market. The project objective is to enhance the software and reduce the amount of manual verification and documentation of results that is currently required, and update the software on a more supportable technology that improves the maintainability and testability of the application.

12 BMS Performance Certification

The mathematical problem for solving the Security Constrained Unit Commitment (SCUC), Real-Time Commitment (RTC), and Real-Time Dispatch (RTD) optimizations is formulated using a Mixed-Integer Programming (MIP) technique in the Business Management System (BMS). The NYISO utilizes a commercial product solution engine, Gurobi, in its software to solve this problem. Major new releases of this product that include performance improvements and resiliency features occur every two to three years. To take full advantage of the new features, the NYISO must also upgrade the hardware the Gurobi software runs on.

As part of evolving the NYISO's energy market, new features are being added to the BMS that have the potential to degrade its performance over time. Projects such as the Gurobi (MIP) Migration and Upgrade help to keep the BMS in peak performance conditions. To understand the performance limitations of the BMS, the NYISO will engage the BMS software vendor to conduct performance benchmarking and determine maximum limits on facilities such as generators and ESRs the Gurobi software can support and still meet its required performance limits.

13 BTM Solar Demand Forecasting Product Enhancements

Behind-the-meter (BTM) solar resources are continuing to grow at a significant pace across the New York Control Area. Maintaining accurate assessments of BTM solar generation capacity and performance is key to both short- and long-term load forecasting efforts. Some of the current processes for tracking solar capacity tracking and forecasting system tuning requires the manual updating of data compilation programs and management of several databases. The manual tracking of solar BTM capacity can be an overly time-consuming process that is also inherently risky due to the increased potential for data entry/transformation errors. By replacing this process with a more-automated one, the speed and accuracy with which these assessments can produced would be significantly increased. Efficiencies could be gained by introducing additional automation into the current solar forecasting capacity management along with future linkage into the NYISO Distributed Energy Resources (DER) aggregation system.

14 Business Entity and Credit Questionnaire Enhancements

The Credit Management System (CMS) currently provides the credit team with business entity information, including credit contacts, role, phone number, address, etc. The current functionality of CMS is limited in its ease of use, including searches, exporting and viewing contacts across organizations. Enhancing this functionality will allow the credit team to view all credit contacts by organization, easily export information, and search by different criteria.

In addition, the credit team does not have the ability to quickly determine in which ISOs/RTOs each Market Participant operates. Enhancing the credit questionnaire functionality to indicate the ISOs/RTOs that each participates and provide the ability to export all Market Participants by ISO/RTO will be beneficial for quickly analyzing any Market Participant that may present a credit risk to the NYISO.

This project will enable the credit team to better manage each business entity, reducing redundancy and inaccuracy in entry, and provide for efficient searches and exports of contacts. It will also allow the credit team to quickly identify all Market Participants in each ISO/RTO to analyze potential credit risk.

15 CMS and ConInvoice Data Integration

Finance manages a number of processes to manually update collateral, prepayments, and Market Participant transfers and refunds within the 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 both the Accounting and Credit teams.

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

16 Content Management and Collaboration Solution

Box.com is a cloud-based solution used by the NYISO to securely exchange files and collaborate with external parties. Box provides the NYISO content owners flexibility in managing access to information while providing necessary control and security measures to protect sensitive information. This project will migrate existing functions that exchange sensitive files to Box and configure collaboration with external parities.

17 Contingency Analysis Results for Transmission Owner Situational Awareness

The NYISO's Operations Group uses a software application called Security Monitor to monitor transmission flows vs applicable line ratings. The application provides Operators with a consolidated summary of real time information including actual line flow vs normal rating, post contingency flows to applicable emergency ratings, interconnection reliability operating limit flows to limits, etc. This information could provide the transmission owners (TOs) with valuable situational awareness in real time to identify differences in projected post contingency flows. This information can also be used to perform a Real Time Assessment every 30 minutes as required by NERC reliability standards during periods when the TOs' analysis tools are not functioning. The objective of this project will be to develop and deploy software to make this information available to the TOs in real time.

18 Control Room Logging Replacement

The NYISO's Grid Operations team uses a tool known as the Control Room Logging (CRL) application to record system conditions and Control Room activity in a consistent manner. Grid Operations' recording requirements have evolved over time, resulting in the need for enhancements to the CRL application. However, the NYISO's ability to modify and maintain the CRL application is limited because the application uses outdated technology. The objective of this project is to determine an appropriate replacement to this application through a Buy -vs-Build Study.

19 Credit Price Spread Updates Virtual and External Transactions

Credit requirements for Virtual & External Transactions rely on price differentials at the 97th percentile between the Energy price in the Day-Ahead Market and Real-Time Market.

Price differentials are currently determined utilizing data from April 1, 2005 as set forth in the Services Tariff. To ensure credit requirements adequately cover market exposure, this methodology must be re-examined. This project would evaluate the appropriate timeframe of historical data to use to determine the price differentials used in both Virtual and External Transactions credit requirements.

20 Demand Forecasting Operational Reporting Enhancements

Some current processes for creating daily (e.g. day-ahead and real-time forecast verification) and monthly (e.g. annual energy budget tracking, weather/DER data validation) forecasting reports require the manual updating of SAS programs and Excel spreadsheets. Efficiencies could be gained and risk of error reduced by introducing additional automation into the current processes. By replacing the current process with a more-automated one, the speed and accuracy with which these reports are produced would be significantly increased, allowing for quicker access to critical data that is needed for forecast model development and decision-making. This enhancement would enable the Demand Forecasting and Analysis department to better support internal and external stakeholders who rely on these reports and post-processed data sets to inform operational, financial, and comprehensive system planning processes.

21 Finance Systems Technology Upgrades

Several of the NYISO's settlements applications currently utilize an out-of-date software framework that is no longer supported or patched by vendors. Settlements is part of the Core Market Platform group of applications that serve as the foundation for providing the core functions of the NYISO. Updating the framework will modernize the application's architecture, and allow the NYISO to better support the applications, improve the security stance of the organization, and provide greater capability and efficiency in testing. The project objective is to perform necessary technology updates for the settlements applications.

22 ICAP Supplier Status Enhancements

The NYISO's Installed Capacity Market Operations (IMO) team currently manages Installed Capacity Market (ICAP) Supplier statuses manually. ICAP Supplier statuses include ICAP Ineligible Forced Outage (IIFO), Mothball, and Retirement. These statuses are maintained manually within the Automated Market System (AMS) through the "Derating Factor" value as a proxy for all inactive states. As a result, this manual tracking and accounting process requires careful attention and leads to redundant or unnecessary

ICAP Supplier data in the AMS. The enhancement to automatically track ICAP Supplier status will increase efficiency and reduce the potential for error.

23 IT Development and Control of Compliance Reports

The NYISO's Market Mitigation and Analysis Department (MMA) currently uses a number of reports, dashboards, and screens to comply with Services Tariff Attachment H provisions. MMA has identified areas for improvement to certain existing reports and tools, which are maintained within the MMA Department, and the need for new reports. This project will add additional software controls to maintain controlled versions of preexisting reports, dashboards, and screens, as well as develop new screening tools to assist MMA in the administration of Attachment H provisions.

24 Krey Control Room AV Replacement

The Krey Control Room and associated Operations conference room, simulator room, and gallery have displays and ancillary services that are made up of certain Audio/Video components that are end of life and no longer supported by vendors. This project will evaluate and recommend an upgrade path for all the end of life components in this system. Services impacted in the aforementioned rooms include, audio at individual desks and room, room controls (lighting, audio, cable), video feeds, and chart recorder displays.

25 LFDR Upgrade and Enhancements

The Load Forecasting Data Repository (LFDR) is currently the real-time "flight recorder" for the NYISO's operational load forecasting system. Along with being the data warehouse for both real-time (i.e. 5-min) and day-ahead (i.e. hourly) demand forecast information, the LFDR also serves as the long term archive for weather and behind-the-meter (BTM) solar forecasting and distributed inverter-based solar generation. The LFDR base system will no longer be supported by the vendor in 2022. This project will examine both migrating the LFDR to a new platform and expanding the LFDR's capabilities to include archiving of key economic data sets, integration with non-NYISO system tracking [e.g. Salesforce portal for capacity tracking) and BTM distributed energy resource data (e.g. electric vehicles, fuel-cells, energy storage, and others).

26 Market Validation, Reporting, and Penalty Tracking Enhancements

The NYISO's Installed Capacity Market Operations (IMO) team administers several manual market validation and reporting processes as well as ICAP Supplier penalty calculations that are achievable only through software developed and tested within IMO. These tools

and processes include (i) the Spot Market Validation tool to independently recalculate the Spot Auction clearing price and analyze Market Participant behavior, (ii) the ICAP Market Report to post recent and historic market data publically and which replaces the annual ICAP Market report to FERC, and (iii) Dependable Maximum Net Capability penalty calculations authorized by the Market Services Tariff. The project enhance the ICAP AMS to include functionality that automates each of these important tools and processes.

27 Meter Services System

Meter Services Entities (MSEs) provide metering and meter data services for various entities within the NYISO markets through existing Tariff rules supported by the NYISO MSE Manual, Revenue Metering Requirements Manual, and MSE Registration Packet. Currently, the administrative functions to support the collection and auditing of meter inventory data from both MSEs and Member Systems are being performed through spreadsheets and manual processes. The project objective is to develop a software system for better management of meter inventory data provided by and MSEs and Member Systems.

28 Microsoft 365 Enhancements

This project is part of a strategic focus on implementing a Hybrid infrastructure model that will leverage cloud solutions, where appropriate, to increase delivery flexibility, agility, and efficiency with the NYISO. The project will expand the NYISO's adoption of Microsoft 365 cloud services, reducing the size of the NYISO's on-premise infrastructure footprint and the corresponding administrative overhead, freeing up NYISO staff for higher-value work. This project will provide access to new features and capabilities not available in an on-premise deployment, including security and information protection enhancements.

Implementing transformative cloud technologies with the rollout of Microsoft 365 positions the NYISO to improve service, features, and functionality to both internal and external customers at reduced cost.

29 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 and modify associated program cost and rates. This project will involve development of new software and/or modifications to existing software that supports program registration and updates of the current cost and rates.

30 Natural Gas Notices Enhancement Project

The NYISO receives email notifications from natural gas pipelines and local distribution companies ranging from informational postings, planned outage data, capacity constraints, Operational Flow Orders, force majeure, interruption of service notices, etc. These notices contain a significant amount of information but are often cumbersome to process and quickly obtain relevant information for real-time operations. This project would enhance NYISO Grid Ops situational awareness of critical, real time gas notices by developing a system for managing the notices and providing relevant information to the NYISO operators.

31 NetBackup Appliance Refresh

The NetBackup appliances in the NYISO corporate and CIP environments are end of life in 2022 and 2023. To ensure the NYISO's backups are reliable, the backup appliances must be up to date and vendor supported. This project will evaluate whether to refresh the NetBackup appliances or replace the NetBackup appliances with another vendor solution and then implement the selected solution.

32 Next Generation Test Environment Study

Currently the NYISO has a limited number of controlled Quality Assurance (QA) environments available for testing. These environments were originally intended to support monolithic software releases that followed a fixed schedule. As the NYISO moves towards modernizing its software delivery capability and providing solutions in a more rapid and efficient manner, the limited number of environments and their lack of flexibility have become impediments to achieving that goal.

The objective of this project is to position the NYISO for modernizing its test environments by completing a study that assesses the options for best addressing the constraints around current QA environments, determines the most appropriate solution(s), and outlines a high-level design, cost, and plan for deployment.

33 NYISO Hosted Siemens Cloud

This project focuses on solving the current and future logistical problems of running dynamic simulations on laptops for power transmission simulation and analysis, which for a full dynamics simulation has taken days to complete. Given needed changes to the composite load model (CMLD), System & Resource Planning (SRP) is anticipating that the amount of time to complete a full dynamics simulation could increase to several days.

With the introduction of DERs, SRP is anticipating that there will be another increase in time to complete full dynamics simulations.

Creating an option for SRP to run dynamic simulations in a cloud solution will allow SRP staff to run simulations across a large number of logical cores thus reducing simulations in a fraction of the current time required. This ability will be important for the completion of dynamics studies for compliance, interconnection, and other reliability planning studies. The project will develop a NYISO hosted Siemens Cloud implementation that can support dynamics simulations with simulation runtimes that are a fraction of the current runtimes.

34 On-Boarding of New Resources

Improving the current process for on-boarding new resources will be required to facilitate the rapidly increased volume of resources using battery storage, solar and/or wind technologies that are seeking to participate under the multiple participation models (*e.g.*, ESR, Solar, Wind, CSR, DER/Aggregations, and HSR), and to mitigate the significant strain on many NYISO departments. The NYISO seeks to streamline processes and provide educational material that focus specifically on the on-boarding process. The educational material are expected to be targeted by technology type and/or participation model and cover a broad range of information that spans the various stages of the on-boarding process, *e.g.*, early stage interested entities who are trying to assess the New York market, developers working towards market participation and Market Participants with project specific technical questions.

The project will document the current on-boarding processes, identify opportunities to streamline those processes, and create easily accessible self-serve on-boarding educational material that include, but are not limited to FAQs, checklists, knowledge articles, info graphics and training videos.

35 Outage States Portal/Dashboard

The NYISO's IMO team administers ICAP Supplier outages states procedures in coordination with the NYISO's ICAP MMA and Scheduling departments. This process requires frequent email communication with ICAP Suppliers and careful and consistent tracking of internal and external communication regarding ICAP Supplier outages over long periods, 6-12 months or longer.

The project will develop software, "Outage States Portal," for more effective tracking of outages, close coordination and communication between the NYISO and the impacted Market Participants. Moreover, it will reduces the risk to the NYISO and to Market

Participants that tariff-defined deadlines will pass without action and that they or the market will be adversely impacted.

36 PI Tools Upgrade

The NYISO seeks to improve operations efficiency and situational awareness, as well as ensure the ongoing availability of security patches and vendor support for a critical system, with the implementation of the following PI Tools;

- The EMS Visualization Native PI Viewer - Interface and Event Tool will improve the NYISO's system operations efficiency and situational awareness by allowing for native rendering, manipulation, and automation of PI displays. The tool will remove the need for additional virtual machines 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.
- The PI Vision Tool will ensure the ongoing availability of security patches and vendor support, as the vendor has notified the NYISO that security patches for the existing application will no longer be issued at the end of 2022.

37 Price Validation Technology Upgrade

The Price Validation (PV) application supports critical function for Market Validation (MV) team. It is used to (a) verify price calculation; (b) confirm the correct price setting resource; (c) reserve hours where pricing errors are suspect; and (d) correct erroneous prices. PV is an old application that was built on technologies that are end of life.

The project will upgrade the PV application using a modern technology stack that can be supported and patched. The project will assess overall architecture of the current PV application, including the User Interfaces, and deliver an upgraded and improved application.

38 Privilege Access Management Upgrade and Enhancements

The Privilege Access Management products support NERC CIP audit requirements for controlling access within the NYISO organization. Maintaining the Access Management program capabilities requires updating the support versions for each product in the portfolio. This project will perform the upgrade that is required by June 2022 to maintain support.

39 Salesforce CRM Optimization

This project will (1) improve the Salesforce Customer Relationship Management (CRM) platform, optimizing customer service and organizational excellence; (2) enhance the synchronization of contact information between key NYISO applications, which is necessary to meet increasing customer demands due to the influx of new resources pursuing participation in the NYISO administered markets; and (3) provide effective integration and management of customer contact records across the NYISO's applications: Demand Response Information System, and Market Information System.

40 SDDB Steady State Dynamics Database MP Portal

Currently the NYISO performs the NERC MOD-32, MOD-026 and MOD-027 standards and NYSRC I4 requirements to review and update the Dynamic data of the Generators in New York Control Area on an annual basis. At present, the NYISO meets these compliance requirements through an extensive manual process. Maintaining the dynamics modeling data for such a large number of generators manually is time consuming and inefficient. The manual processing of data requires significant resources in terms of person-hours and each manual update and transfer of data represents an opportunity for error. The validation and accuracy of the dynamic models are critical, as this information is used in developing the Dynamics Base cases, which is used by the various departments in Planning and Operations Engineering, external stakeholders including Transmission Owners, Developers etc.

The project will implement SDDB Steady State/Dynamics Database – MP Portal software and extend the impact of SDDB software by creation of an external portal that will allow Market Participants to enter generator data directly into the database. This portal will mitigate the need for much of the manual data handling.

41 System Demand End-Use and Electrification Forecasting Enhancements

The State of New York is working to implement the New York Climate Leadership and Community Protection Act (CLCPA). The targets of this law include achieving 100% zero-emission electric generation by 2040 and reducing overall emissions at least 85% below 1990 levels by 2050. NYISO stakeholders and members of the public are interested in increasing their understanding of the impacts of electrification on the bulk power system. Electrification of the space conditioning sector (heating and cooling) will result in significant changes in the seasonal peaks, monthly energy, and hourly load patterns of electricity usage as compared to today. The additional impacts of electric vehicles, behind-the-meter solar PV, and energy storage will further complicate energy and

demand forecasting. The NYISO currently employs an end-use modeling approach to help understand the electrification impacts on the residential and commercial end-use energy needs through the year 2050 and beyond. To further improve upon the analysis and forecasting of electrification on the bulk power system, the NYISO will review the recent and currently on-going studies on the electrification of several end-use technologies. This review will include developing historical data and future trends of these technologies for use in the end-use models specific to the geographic regions of New York. An updated analysis and assessment of the latest information (e.g. trends in technology adoption and associated gains in energy efficiency) will guide improvements to the end-use and hourly load modeling approach currently used by the NYISO and improve upon its assessments and forecasts of the impacts of electrification across the New York Control Area. As a direct result of this work, the NYISO will increase its current forecasting capabilities and have greater confidence in its annual, monthly, and hourly forecasts of energy as electrification of the grid evolves through time.

42 Transaction Modifications and Confirmation Tool

The Operations and Customer Settlements departments require a tool to be developed that will assist in the validation of external transaction schedules. Following the implementation of 15-minute and Coordinated Transaction 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. Customer Settlements currently uses several Web Form screens to gather and update external transaction information as part of the settlements process. However, these screens (Transaction Confirmation, Transaction Modification, and Transaction Bids) were developed 15 years ago for NYISO Operations to process and schedule external transactions, and do not provide all of the functionality required by Customer Settlements.

There is a need to decouple the dual usage of these screens by Operations and Customer Settlements, and provide each department with their own set of screens, designed specifically for the purposes of each department, which this project proposes to do. This project will not only provide each department with the functionality that they currently need, but will also allow for future updates to be made for one department, without impacting the other department.

43 Unified Communications Platform

The current telecommunications platform is beyond its technology support lifecycle, which creates substantial limitations in the NYISO's ability to support acceptable levels of integration and functionality to the organization. Upgrading to a new platform will solve

for existing risks and limitations related to integration, license expansion, security patching, and continuity of service. This project will replace the current systems with a new modern unified communications platform.

44 Web Content Management System Upgrade

The backbone of NYISO's external information delivery platform is our public website. www.nyiso.com is delivered via a Web Content Management platform that was implemented with the website redesign project in 2018. This technology provides the foundation for how the NYISO communicates with stakeholders, policy makers, press, and the general public. The current version of this platform reaches end of life in June 2022. This project will upgrade the platform to ensure continued vendor support and availability of security and vulnerability patches. In addition, it will make new content management features available to reduce the customization and manual labor needed to support the website.