ORANGE AND ROCKLAND UTILITIES, INC.

INFORMATION TECHNOLOGY PANEL

Table of Contents

ORANGE AND ROCKLAND UTILITIES, INC.

INFORMATION TECHNOLOGY PANEL

I. INTRODUCTION

Q. Would the members of the Information Technology Panel ("Panel") please state their names and business addresses?

A. Manoj S. Chouthai, Jeannine D. Haggerty, Allisyn Glasser, Mikhail Falkovich and Aseem Kapur, all with a business address of 4 Irving Place, New York, New York 10003

Q. By whom are the Panel members employed and in what capacity?

A. **(Chouthai)** I am employed by Consolidated Edison Company of New York, Inc. ("Con Edison") as Vice President of the Information Technology ("IT") Engineering, Operations and Cyber Security.

(Haggerty) I am employed by Con Edison as Vice President of the IT Business Solution Delivery.

(Glasser) I am employed by Con Edison as the Director of Enterprise Architecture and Digital Platforms in the IT Department.

(Falkovich) I am employed by Con Edison as the Director of Information Security in the IT Department.

(Kapur) I am employed by Con Edison as the Director of Business System Development in the IT Department.

Q. Please explain your professional backgrounds and qualifications, as well as job description.

A. **(Chouthai)** I hold a Master of Business Administration degree from the Stern School of Business from New York University ("NYU"), a Master of Science in Information Systems from the Graduate School of Arts & Science from NYU and a Bachelor of

Engineering in Electrical Engineering with a specialization in Electronics from the Walchand College of Engineering. I have been employed by Con Edison since November 2019 in my current position as Vice President of IT responsible for IT Engineering and Operations. IT Engineering and Operations is comprised of Information Security, Enterprise Architecture and Digital Platforms, Networks and Telecommunications and Infrastructure and Operations.

(Haggerty) I hold a Master of Science degree in Energy & Environmental Management from New York Institute of Technology and a Bachelor of Science degree from Manhattan College in Finance and International Business. I have been employed by Con Edison since 1991, holding positions of increasing responsibility in Central Field Services, Purchasing, IT and Electric Operations. In July 2019, I was promoted to my current position, Vice President of IT Business System Delivery responsible for application development and support.

(Falkovich) I hold a Bachelor of Science and Master of Engineering degrees from Cornell University. I have been employed in the electric utility industry for the last 20 years, holding positions of increasing responsibility in IT, Engineering, Legal, and Information Security. I was hired by Con Edison as Director of Information Security in May 2016. I am responsible for the Company's cybersecurity initiatives, including threat and risk management, and cybersecurity compliance.

(Glasser) I hold a Bachelor of Science degree in Management Information Systems from the University of Connecticut and a Master of Business Administration degree in Project Management from DeVry University in 2007. I have been employed by Con Edison

since 1998, holding positions of increasing responsibility in Finance, Treasury, Shared Service Administration, Orange and Rockland Utilities, Inc. ("O&R" or the "Company") Operations, and IT before my current position of Director Information Technology Enterprise Architecture and Digital Platforms. I am responsible for the enterprise architecture of the Company's infrastructure, networks and applications. This includes the design, planning, analysis and implementation of IT enterprise solutions. I also have responsibility for Digital Factory, focused on mobile application development and process automation, the Analytics Center of Excellence as well as cloud and integration services.

(Kapur) I received a Bachelor of Science Degree in Mechanical Engineering from Rutgers, The State University of New Jersey and I am enrolled in the Executive Master of Business Administration program at The Wharton School, University of Pennsylvania graduating in April 2021. In June 2003, I joined Con Edison as a management intern, holding positions of increasing responsibility in Distribution Engineering, Smart Grid Implementation Group, and Manhattan Electric Operations before my current position. I was promoted to my current position in July 2016; I am responsible for the Outage Management Systems, Control Center IT Operations and Enterprise Geographical Information System ("GIS"), including the development and delivery of software applications used to design, construct, and operate the electric distribution grid at Con Edison and O&R. The Business System Delivery team facilitates change of business practices and processes by using cutting edge technologies, information, and applications software.

Q. Have any Panel members previously submitted testimony or testified in a proceeding before the New York State Public Service Commission ("Commission")?

A. Ms. Glaser, Mr. Kapur and Mr. Falkovich submitted testimony in Con Edison Cases 19-E-0065 and 19-G-0066.[1] None of the other Panel members have submitted testimony or testified.

II. SUMMARY OF TESTIMONY

Q. Please explain the purpose of the Panel's testimony.

A. The Company's IT Department, working with all corporate organizations, directs the Company in managing and meeting its growing technology needs. The Company implements technology-based solutions to meet its key corporate initiatives – operational excellence, safety and an enhanced customer experience - and has matured as technology continues to advance. IT directs and supports all Company organizations by designing, developing, and implementing technology initiatives and strategies.

This testimony discusses:

- The Company's overall IT philosophy, including its strategy, Guiding Principles, and IT projects and planning, including major technology initiatives; and
- The planned IT-related capital investments and IT operating and maintenance ("O&M") expenses, including the infrastructure categories associated with computer hardware, devices, networks and telecommunications.

[1] Case 19-E-0065, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*; Case 19-G-0066, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Gas Service.*

Q. Please discuss how technology is changing.

A. Technology is advancing at a rapid pace. It is changing the way businesses operate; for example, mobile technology, cloud, and automation provide solutions that were not available several years ago. Technology trends continue to move quickly and the IT Department's role is to stay abreast of the trends and enable the Company to take advantage of these technologies as appropriate.

Q. Please explain.

A. The Company, in general, and the IT Department, specifically, is transforming the way we do business. We are continuing our investments to support our core business, improve the services we provide to customers, maintain cybersecurity and reduce costs. We are making investments in several major transformational technology initiatives. For example, the Company recently completed the installation of its Advanced Metering Infrastructure ("AMI").

In this technology-focused age, the Company has additional plans for foundational investments, such as a new Con Edison and O&R Engagement ("CORE") Project which is the joint Con Edison and Orange and Rockland New Customer Service System Implementation Project discussed in the Customer Service Panel's direct testimony, and emerging technology trends, like using the cloud and automation required to support safety processes, enable operational excellence, and improve the customer experience.

Q. What time period does your direct testimony cover?

A. The Panel presents the programs planned for the 12-month period ending December 31, 2022 ("Rate Year" or "RY1"). While, as discussed by the Company's Accounting Panel,

the Company is not proposing a multi-year rate plan in its rate filing, the Company is interested in pursuing, through settlement discussions with Staff and interested parties, a multi-year rate plan. To facilitate settlement discussions, we also address capital plant additions and other programs and initiatives for the two years following the Rate Year. For the sake of convenience, we will refer to the 12-month periods ending December 31, 2023 and December 31, 2024 as "RY2" and "RY3," respectively.

Q. What is the amount of capital funding for IT projects that the Company is including this filing?

A. The Company has included approximately $90 million in requested capital funding for IT-related projects over the three-year period, 2022-2024. As shown in more detail below, these programs and projects are described in this Panel's direct testimony and the direct testimony of other witness panels in this rate case filing.

Q. Please provide an overview of the Company's funding requests sponsored by this Panel.

A. This testimony and accompanying exhibits describe the IT Department's proposed capital projects (*i.e.*, $44.0 million over the period 2022-2024) and associated incremental O&M program changes (*i.e.*, $10.2 million over the period 2022-2024).

Q. Is this Panel proposing projects and programs with capital and/or O&M expenditures over the next three years?

A. Yes. The projects and programs described in this direct testimony are primarily for the IT Department's needs, as well as foundational items for systems implemented Company-wide. This Panel sponsors projects under the following categories:

- Cybersecurity;

- Systems/ Applications;
- Technology Enablers; and
- Infrastructure.

Q. Please describe the forecasted capital request for each rate year and its main drivers.

A. The RY1 capital request is $10.5 million, RY2 capital request is $12.7 million and RY3 capital request is $20.8 million. The main drivers for these programs are outlined in the table below.

ORU IT Major Drivers	Major Projects	Rate Year 1	Rate Year 2	Rate Year 3
Systems/Applications	OMS	$2.2	$0.8	$0.8
	Mainframe Elimination	$0.5	$1.1	$0.8
	WMS	$0.0	$0.0	$10.0
Infrastructure	Mainframe	$1.5	$0.0	$1.5
	Network	$1.3	$2.4	$2.1
Technology Enablers	Digital Factory	$1.0	$1.0	$1.0
	Cloud Program	$2.2	$5.1	$0.0
	O365/E5	$0.0	$0.0	$1.9
Cybersecurity	Cybersecurity	$0.5	$0.5	$0.5

Q. Please describe the O&M request for each rate year and its main drivers.

A. For O&M, we are forecasting program changes for $2.0 million in incremental expenditures in RY1, an additional $1.6 million in incremental expenditures in RY2, and an additional $0.7 million in incremental expenditures in RY3. The major program change drivers are outlined in the table below.

O&M Program Changes	Rate Year 1	Rate Year 2	Rate Year 3
Cybersecurity	$0.5	$0.8	$0.9
OMS	$0.3	$0.3	$0.7
Mainframe Infrastructure	$0.4	$0.5	$0.6
Hardware/Software Maintenance	$0.2	$0.3	$0.4
Cloud Programs	$0.4	$0.5	$0.5
WMS Replacement	$0.0	$1.0	$1.0
Digital Factory	$0.1	$0.2	$0.2

Q. Please describe the drivers for additional resources.

A. The Company is proposing to hire four additional resources under the incremental O&M request. These include one additional resource to support the ongoing maintenance of the new Advanced Distribution Management System ("ADMS"), one additional resource to support the deployment of the cybersecurity program at O&R, and two additional resources to support the maintenance of new Digital Factory products. These resources are needed to manage the new systems, including coordination of planning, testing, patching, and ongoing enhancements associated with the new applications.

Q. Please provide an overall list of the IT-related programs and projects described by the Company's other witness panels in this rate case filing.

A. Some of the major projects and programs sponsored by and discussed in the Company's other witness panels include:

- Customer Service Panel
  - CORE
  - Customer Relationship Manager ("CRM") System
  - Oracle Analytical Systems Platform
  - Customer Service Virtual Assistant Artificial Intelligence

- Gas Infrastructure and Operations Panel
  - ORU Gas Mobile Dispatch ("GMD")
  - Locus View
  - Gas Outage Management
- Electric Infrastructure and Operations Panel ("EIOP")
  - Advanced Distribution Management System ("ADMS")
  - Energy Management System ("EMS")
  - Jump Program

Q. Why are some IT-related projects and programs described by other witness panels?

A. The IT Department works with the business organizations to design, develop, and implement systems that underpin the operations of the user organization. Each organization requests the programs necessary for its operations. These include larger projects (*i.e.*, major technology initiatives) that require significant investments. Major technology initiatives require joint partnerships between the IT Department and the user organization and, as described later, generally require studies or pilots in advance of any actions to design the solution and estimate costs and level of effort. The purpose of these studies or pilots is to assess the technical feasibility and determine project risks associated with deployment.

Q. What benefits does the Company expect from these major technology initiatives?

A. The Company expects that benefits from these investments will include streamlining and consolidating systems, enabling new functionalities needed to advance State policy

objectives (particularly clean energy related), advancing cybersecurity, and reducing obsolescence risk.

Q. How are the overall IT needs of the Company addressed?

A. The IT Department assigns employees to work with operating and/or support organizations to assist with those organizations' technology needs. IT Department staff and the business organizations work together to determine the needs and develop proposed solutions for those needs. For example, the EIOP's direct testimony describes several IT projects aimed at improving outage and storm response distribution automation, and data and asset management.

III. IT OVERVIEW

Q. Please describe the relationship of the IT Department to the Company as a whole.

A. The IT Department provides the Company with reliable, secure and innovative technology to meet the needs of its customers and employees in an ever-changing and increasingly complex environment. The IT Department works to:

- Develop, implement, and maintain cybersecurity programs, awareness, and operations;
- Develop and implement IT strategy and governance;
- Design, develop, implement, and maintain reliable and available business systems;
- Design, implement, and operate IT infrastructure, networks, and communications platforms; and

- Enable customers and employees to improve continuously, using various technologies as they continue to advance, including analytics, cloud technologies, mobility, and robotics process automation.

Q. How does the IT Department support the Company goals?

A. The IT Department works closely with the Company's various strategic planning groups, operating, and supporting organizations to develop the Company's IT plans. The IT Department forecasts and plans future technology needs, developing standards and product development life cycles (*e.g.*, roadmaps) for technologies that show, among other items, dates for planned upgrades or when support will no longer be available. The IT Department also establishes processes so that the Company may maintain current technology and obtain solutions to future needs. The IT Department also looks to advance and improve the Company's technology cabapilities by understanding available technology.

A. Guiding Principles

Q. What are the IT Department's Guiding Principles to prioritize and align the Company's portfolio with the IT strategy and plan for projects in the upcoming period?

A. The IT Department's Guiding Principles direct Company-wide IT investment decisions. They are:

1. **Achieve business value**: Strategically align IT work with business objectives and priorities by partnering with our internal customers and define clear project plans for technology needs.

2. **Promote "One Enterprise":** Implementing enterprise-wide systems and platforms requires that the Company implement several initiatives, including:

- Streamlining business processes by using Company-wide application platforms and standardizing common platforms/solutions to reduce costs;
- Reducing and segmenting the application portfolio and matching support levels to system needs;
- Focusing talent on the highest value work, such as technology enablers, and using vendors for standard work; and
- Developing strategic partnerships with vendors to standardize technology platforms and effectively manage costs and support.

3. **Excel at the basics**: Modernize core IT systems and infrastructure to improve security, availability, reliability, cost efficiency, and ability to respond to new needs by further adopting cloud architecture, consolidating data centers to optimize on-premise footprint, and optimizing computer and telecommunications equipment inventory.

4. **Enable speed and flexibility**: Given evolving external customer expectations, rapidly changing requirements in the utility industry, including the Reforming the Energy Vision proceeding,[2] and available technology, the IT Department is using software development methodologies that promote simpler design and more frequent product delivery.

5. **Foster and promote innovation**: Leverage rapidly maturing, best-practice capabilities to support future growth and efficiency. The IT Department's objective is to innovate

[2] Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV Proceeding").

and modernize the Company's utility/business operations using Technology Enablers, as discussed later in this direct testimony.

Q. Please explain the IT Department's plan for projects and programs.

A. The IT Department has an overall plan relating to the projects and programs over the next five years, which has guided the IT Department and the Company through recent major technology initiatives. This plan considers corporate-wide projects as well as the IT Department's strategy of investment in four key areas – Cybersecurity, Systems/Applications, Technology Enablers, and Infrastructure – to address the Company's growing technology needs. We further discuss the IT Department's projects and planning process in the next section of this direct testimony.

Q. Please explain the Company's Cybersecurity strategy.

A. The Company works to mitigate the growing cybersecurity threat and protect the confidentiality, integrity, and availability of its systems and data through implementation of a robust set of processes and internal controls. To accomplish this, the IT Department continues to focus on deploying new technology to mitigate new and evolving threats, enhancing the capabilities and functions of the cybersecurity team, and implementing new procedures and policies to embed security throughout Company processes and systems.

Q. Please discuss the Technology Enablers, often referred to as "Digital Transformation," portion of the Company's IT Strategy.

A. The Company is investing in Technology Enablers, which are technologies that provide the ability to improve existing business processes and provide technical enhancements

that increase software and hardware capabilities. These technologies include Cloud, Robotics, Analytics, and Mobile Platforms. When we implement these programs, we are also standardizing these new technologies to avoid technology redundancies, reduce costs, embed cybersecurity, and enable quicker delivery of the technologies mentioned above.

Q. Please discuss the third component of the Company's IT strategy, Systems/Applications**.**

A. The Company continues to move its portfolio from over 500 discrete and sometimes redundant departmental systems to more fully functional enterprise capabilities. By applying the guiding principles, the Company is focusing employee resources on opportunities that deliver the most value while using more agile development methods and enabling technologies. The Company is leveraging enterprise agreements to deliver new or enhanced capabilities on most major projects and that provide the opportunity to access supplemental and specialized resources through strategic partnership with sourcing vendors (managed service providers). In addition, the Company is allocating its application support resources by service tiers defined by the impact that each application has on Company strategic priorities of safety, operational excellence, and the customer experience.

Q. Please discuss the last component of the Company's IT strategy, Infrastructure.

A. The Company continues to modernize and consolidate its data centers, modernize and expand our networks, continuously enhance our security practices, and leverage cloud technologies to increase reliability, resiliency, scalability, and speed to market while reducing the total cost of ownership.

B. IT Projects and Planning

Q. Has the IT Department's project and planning process included the implementation of major technology initiatives?

A. Yes. The Company has completed several major technology initiatives in recent years, and has several underway, all of which have furthered our goals of transforming and improving how the Company operates.

Q. Please discuss the Company's recently completed major technology initiatives.

A. Over the past decade, as part of the prior five-year projects and planning process, the Company has implemented several major technology initiatives, including the AMI roll-out, the new Outage Management System ("OMS") and Enterprise Communication and Location Services for connected vehicles.

Q. Does the Company have any major technology initiatives underway?

A. Yes. The Company is currently implementing several major initiatives, including CORE, ADMS and the Distribution System Platform ("DSP"). As noted earlier, these are discussed in the direct testimony of other Company witness panels.

Q. In addition to these major technology initiatives, is the IT Department implementing any transformational enterprise-level technology enablers?

A. Yes. The IT Department is focused on four Technology Enabler projects - data analytics, cloud computing, Digital Factory, and robotics process automation.

Q. How does the Company prioritize key major technology initiatives and enablers?

A. The Company prioritizes major technology initiatives and enablers through the corporate capital optimization process governed by the IT Board that includes senior management

representatives across all the business units. In addition, the IT Department considers the guiding principles (discussed above) and emerging technology trends in determining what projects to undertake, in what order, as it works with business areas to understand business needs and determine what technology can best meet their objectives.

As a result, the Company performs a strategic planning process to develop a technology plan and evaluate whether to undertake projects considering, among other items, value to customers, risk mitigation, cost benefit and rate impact, and resources required to complete the projects.

Q. Once the Company identifies a need for a major technology initiative, what is the Company's process for developing such initiative?

A. Generally, when the Company identifies the need for a new core utility system, a team is formed to study the options, costs, and benefits. This team develops requirements and performs what is commonly referred to as an implementation study (also known as a Phase 0 study).

Q. What is an implementation study?

A. An implementation study is a combination of high-level requirements, impact on existing technology, project feasibility, and planning steps and is a pre-requisite for the implementation of major technology initiatives. The Company has completed implementation studies prior to implementing major corporate systems.

Q. Why does the Company perform an implementation study?

A. The Company uses the implementation study to determine the scope of the project, which then becomes the basis for the work plan, labor, hardware/software needs, vendor partnerships, and any other components.

Q. Please describe how the implementation team is comprised and the team's function.

A. The team includes a project manager, business area subject matter experts and IT Department personnel. The team also typically includes resources from an IT consulting firm that has experience with implementing the target technology. The deliverables from the analysis include a detailed implementation plan with rollout schedules. Key components needed to develop this plan include a(n):

- summary of business requirements, including which functions need to be developed and implemented.
- detailed project schedule with
  - implementation options,
  - necessary resources, and
  - an initial cost estimate.
- infrastructure and capacity plan.
- comprehensive data conversion plan.
- complete testing plan.
- rollout plan.
- change management plan.

Q. How long does it generally take the Company to develop an implementation plan?

A. Typically, for a major system, it takes six to nine months to complete the implementation plan.

IV. CYBERSECURITY

Q. Please describe the Company's cybersecurity initiative.

A. Cybersecurity is the process of maintaining the confidentiality, integrity, and availability of computing resources against attacks from hackers and malicious software. Protecting the Company's systems is important because there are risks to both the Company's critical infrastructure and customer information, including personally identifiable information ("PII"). A successful cyber-attack could, for example, have safety and/or reliability consequences for our customers, our employees, and the public. Over the past few years, the risk of a cybersecurity incident has increased dramatically, as can be seen by multiple organizations experiencing impacts to their operations and losing confidential customer information.

Q. Does the Company have a cybersecurity program?

A. Yes. The Company has implemented a strategy that combines defense-in-depth (multiple security layers) with defense-in-breadth (multiple tools at these layers) concepts. As new risks are identified, and the capabilities of adversaries increase, the Company reassesses current security controls, implements new processes and capabilities, and invests in new technologies to maintain a secure posture and stay ahead of malicious actors. Cyber-attack risks include operating failures of control systems, damage to transmission and distribution ("T&D") assets, the loss of sensitive data, and employee and public safety.

Q. Does the Company work with others regarding cybersecurity?

A. Yes. The Company participates in industry-wide initiatives with Edison Electric Institute ("EEI"), American Gas Association ("AGA"), North American Electric Reliability Council ("NERC"), and other regional and governmental partners to improve cybersecurity capabilities for the electric sector. We also design, facilitate, and participate in drills with our industry and government partners, including the Electricity Information Sharing and Analysis Center ("E-ISAC").

Q. Are there other initiatives that affect the nature of the Company's actions to address cybersecurity?

A. There are several initiatives/rules that affect the Company's actions. They include:

- The Company's ongoing reviews of its cybersecurity program with Department of Public Service Staff;
- The Commission's recommendations, in Case 13-M-0178,[3] for utilities to handle, protect, and dispose of customer PII;
- Revisions, and additions to NERC's Critical Infrastructure Protection standards, which contain federally enforceable cybersecurity rules for the bulk electric system;
- National Institute of Standards and Technology ("NIST") Cybersecurity Framework, which contains a voluntary framework for cybersecurity standards; and

[3] Case 13-M-0178, *In the Matter of a Comprehensive Review of Security for the Protection of Personally Identifiable Customer Information*.

- Potential legislation and regulations at both the federal and state level regarding cybersecurity (including supply chain efforts) and privacy, including data losses and breaches. We are continuing to monitor legislative and regulatory activity in this area. As new cybersecurity, privacy and supply chain risk management rules and regulations are developed, the Company may incur additional incremental costs to manage these risks and maintain regulatory compliance.

Q. How has the Company been addressing the cybersecurity challenge?

A. The Company continues to address cybersecurity from three main vantage points: (1) prevention and education, (2) monitoring, detecting, and alerting, and (3) responding to incidents, including recovery/mitigation.

Q. What does the Company mean by prevention and education?

A. Prevention is aimed at avoiding any attacks on our system. Education provides employees with information on their role in preventing cyber intrusions, awareness of cybersecurity threats, and proper cyber hygiene protocols.

Q. Please explain some of the prevention-related steps the Company undertakes.

A. Under prevention, the Company undertakes various steps to protect its systems. For example, the Company:

- Mandates that any new technology implementation is passed through an architectural and cybersecurity review (and if the technology involves PII, a Privacy Impact Assessment ("PIA") is performed). Thus, systems are assessed against current standards and risks mitigated prior to installation;

- Performs risk assessments on external parties or vendors who receive sensitive information to assess whether appropriate security controls are in place to mitigate the risk of sensitive and confidential data loss;
- Protects the perimeter and internal IT assets with the latest firewall and intrusion prevention technology;
- Deploys technologies on the internal network to either detect or prevent malicious traffic and data loss and mitigate insider threat risk;
- Performs proactive vulnerability scanning using the latest tools to identify risks and exposures, and mitigate risks through aggressive patching and configuration policies; and
- Engages external security experts to perform annual penetration tests on the Company's systems.

Q. How does the Company educate its employees regarding cyber risks?

A. The Company uses several methods to do this. First, the Company has an established "CyberAware" brand and regularly publishes advisories and best practice information to employees. We advise employees when there are potential threats that employees can assist in detecting or the threat may affect the Company or personal equipment. Second, the Company tests employees monthly with phishing emails to raise awareness and mitigate the risks of phishing attacks. Third, the Company regularly trains and drills employees on cybersecurity topics either through mandated training, such as the cybersecurity training for control center personnel, Standards of Business Conduct training, and regular drills both on the departmental level, and Company-wide.

Q. Turning to the second step, detection, what actions does the Company take?

A. The Company operates a 24x7 Cybersecurity Operations Center ("CSOC"), which monitors its entire computing network to detect threats, anomalies, and vulnerabilities. Once detected, the CSOC evaluates any alerts of a threat or issue, and, if necessary, notifies the appropriate personnel and takes remediation and incident response actions. The CSOC also receives any unclassified alerts related to information-sharing from government agencies and other external partners. Once this information is received, the CSOC reviews the alert information and checks to determine if any indicators of compromise are seen on our system.

We also work with external entities, including federal and state governments and the E-ISAC, that provide the Company with information on potential threats on a real-time basis.

Q. Please discuss the actions the Company takes regarding the third cybersecurity area, Incident Response and Recovery/Mitigation.

A. The Company has designed and segmented its network to minimize the impact of a breach. The Company has also developed plans and procedures to respond to cyber-attacks and data breaches. Forensic experts are on staff to both aid in incident response efforts and for post-incident forensic analysis.

Q. Is there more work for the Company to do in the cybersecurity area?

A. Yes. Given the significant rise in the capabilities, volume, attack surfaces and impact of cybersecurity threats, the Company must continue to grow and develop the IT

Department's capabilities, implement technology, and develop processes to protect our systems and data, improve detection, resiliency, and recoverability.

Q. How is the Company addressing this continuing need?

A. To stay ahead of existing threats, the Company must have the technology to prevent and detect threats and upgrade these technologies as new or upgraded versions become available. Staying ahead of the threats means continuing many of the items discussed above. The Company will also continue to work with outside experts on security and threat monitoring.

Q. What cybersecurity related projects is the Company planning to undertake?

A. The defense-in-depth and defense-in-breadth strategy requires constant review and upgrade. As new risks are identified, and the capabilities of adversaries increase, the Company reassesses current security controls, implements new processes and capabilities, and invests in new technologies to maintain a secure posture to stay ahead of malicious actors. Cyber-attack risks include operating failures of control systems, damage to T&D assets, the loss of sensitive data, and employee and public safety.

Q. Please describe the forecasted capital request for each rate year under the cybersecurity program.

A. To continue enhancing the Company's security posture, the Company will invest in multiple cybersecurity efforts to secure both the IT and Operational Technology ("OT") portions of the network including, but not limited to Identity and Access Management, continued segmentation of corporate and high value networks, expanding the Security Event and Information Management system, and other projects/upgrades. The total RY1

capital request is $0.46 million, RY2 capital request is $0.47 million, and RY3 capital request is $0.50 million. (*i.e*., $1.42 million in total over the period 2022-2024)

Q. Please summarize cybersecurity maintenance programs.

A. With the investments in cybersecurity technologies and capabilities, the Company projects the associated maintenance cost to be $1.25 million in RY1, $1.47 million in RY2, and $1.60 million in RY3 (*i.e*., $4.32 million in total over the period 2022-2024). This represents $0.54 million in incremental expenditures in RY1, $0.75 million in incremental expenditures in RY2, and $0.89 million in in incremental expenditures RY3 (*i.e*., $2.18 million in total over the period 2022-2024). The cybersecurity maintenance programs include an allocation of the maintenance costs associated with the capital investments.

A large portion of the O&M budget increase would be the inclusion of advanced cybersecurity technologies, such as an Identity and Access Management solution, a Virtual Private Network ("VPN") replacement solution, and a segmentation solution. As more software solutions are becoming cloud-based and sold as software as a subscription service ("SaaS"), there is a need to account for O&M cost increases associated with using these products. SaaS is a software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted. There is also a need to maintain existing maintenance and subscription contracts from past capital implementations, such as Privileged Access Management and Microsoft security technologies. In addition, contractor services will be required to perform automation of

cybersecurity operations and increase the level of threat hunting, penetration testing, and security assessments.

Q. Is there a document that further explains the Company's cybersecurity program?

A. Yes. There is a confidential exhibit entitled Cybersecurity, which is CONFIDENTIAL Exhibit _(IT-1).

Q. Was this document prepared under the Panel's direction and supervision?

A. Yes.

Q. Please describe this document.

A. This confidential document explains the Company's proposed cybersecurity investments for the next five years.

V. SYSTEMS/APPLICATIONS

Q. What is covered under the System/Applications category of projects and programs.

A. As discussed earlier, under this category, the Company is standardizing and reducing the systems and applications in our portfolio through application modernization.

Q. What projects are associated with the Company's systems and applications?

A. The IT Department and other internal organizations are working on several initiatives, including CORE (as described in the Customer Service Panel's direct testimony), ADMS and Grid Modernization (as described in the EIOP's direct testimony) that will modernize, upgrade, and enable new functionality.

Q. What projects does the IT Department have in the Systems and Applications category?

A. The IT Department has three projects in this area: OMS Enhancement, Mainframe Elimination, and Work Management System ("WMS") Replacement. The last two initiatives include the migration from mainframe technology to updated infrastructure.

Q. Has the Panel prepared a document that explains the projects included in this category?

A. Yes. We have three whitepapers, included in Exhibit _(IT-2) entitled Systems and Applications, which explain these projects. This exhibit was prepared under our direction and supervision.

Q. Please describe the OMS Enhancement project.

A. With the OMS Enhancement project, the Company is undertaking a major software upgrade to its OMS to implement the latest software manufacturer update as well as upgrade the existing technology driving the system.

The upgrade will increase processing capacity for customer calls/contacts during an outage. The time to process 90 percent of 200,000 outage calls per hour would be reduced to under three hours compared to the current duration of 24 hours.

The hardware/infrastructure supporting OMS is being upgraded to enable a high availability architecture and more efficient Disaster Recovery ("DR") process. These investments will increase the reliability and resiliency of the OMS by allowing faster outage notification processing and quicker availability of outage restoration status. These improvements will serve to enhance the customer experience.

Q. Please describe the forecasted capital expenditures for each rate year under the OMS Enhancement project.

A. The RY1 capital forecast is $2.2 million, RY2 capital forecast is $0.83 million, and RY3 capital forecast is $0.83 million (*i.e.*, $3.86 million in total for 2022-2024).

Q. Please describe the forecasted incremental O&M program change for each rate year under the OMS Enhancement project, along with the main drivers for this expense.

A. For O&M, we are forecasting program changes for $0.33 million in incremental expenditures in RY1, no additional incremental expenditures in RY2, and $0.36 million in incremental expenditures in RY3 (*i.e.*, $0.69 million in total over the period 2022-2024). The main drivers for the increase are maintenance associated with new high availability infrastructure for the OMS, and software licensing costs.

Q. Please describe the Mainframe Elimination project.

A. The Mainframe Elimination project aligns with the IT Department's governing principle of "Excel at the Basics" to modernize core IT systems. This is part of a strategic roadmap to eliminate reliance on the mainframe infrastructure. This program will modernize 14 applications in support of Customer Operations, Finance, and other areas as well as the associated infrastructure. The database in these applications will be upgraded from DB2 to an enterprise server solution using Oracle/SQL Server. Applicable source code will be revised for a web-based solution.

Q. Please describe the forecasted capital level for each rate year under the Mainframe Elimination Project.

A. The RY1 capital amount is $0.53 million, RY2 capital amount is $1.11 million, and RY3 capital amount is $0.77 million (*i.e.*, $2.42 million in total over the period 2022-2024). There is no incremental O&M associated with this project.

Q. Is the Company planning to explore the replacement of its existing WMS?

A. Yes. The Company plans to explore options relating to the replacement of its WMS with a more modern system.

Q. Please explain the function of the WMS.

A. The WMS is a comprehensive system that processes electric, substation, and gas operations distribution and transmission work from the point of request and design through to completion. It includes construction, service, and inspection jobs. WMS is heavily integrated with multiple corporate systems, including financial accounting, materials management, payroll and labor distribution, property records, and customer information management.

Q. How long has the existing WMS been in place?

A. The core WMS is currently 30-years old, is based on SCANA vendor software that leverages older technology (COBOL, CICS, DB2) which is challenging to maintain, and has been internally enhanced over the years. The existing WMS is not equipped to meet future business needs associated with unit-based tracking, system integrations, and mobility. In fact, once the existing CIS is replaced, WMS will be the last major Company system dependent upon the mainframe. The Company anticipates that maintaining the mainframe for one product will result in incurring additional costs for the support, maintenance, and disaster recovery planning.

Q. Does the WMS Replacement project tie into the Mainframe Elimination Project?

A. Yes. As noted above, the Company is modernizing some Company applications as part of the Company roadmap to remove system dependency upon the mainframe.

Q. Please explain the correlation between the Mainframe Elimination Project and the WMS Replacement project.

A. The WMS Replacement project is a subsequent initiative in the Company's strategic roadmap to eliminate reliance upon the mainframe infrastructure and standardize the remaining applications onto one of the two enterprise-wide WMS software systems. There are 15 work management-related applications, associated with the WMS replacement project, that will be the last remaining key applications dependent upon the mainframe infrastructure after the Mainframe Elimination project is complete.

Q. Please explain the Company's plans to evaluate its options for replacing the WMS.

A. The Company plans to hire a consultant to conduct an implementation study (Phase 0) for a new WMS. As part of this implementation study, the Company will perform detailed analyses to quantify projected cost savings, outline a project timeline, and identify potential synergies and efficiencies by adopting the WMS solution implemented at Con Edison.

Q. Is the Company including any costs of this WMS effort in this filing?

A. Yes. Under the current schedule the Company will commence replacement of the WMS in RY3. Accordingly, the Company has included O&M of $1.0 million in RY2, $1.0 million in RY3, and capital expenditure of $10.0 million in RY3 as a placeholder for replacing the WMS. As noted in the direct testimony of the Company's Accounting Panel, consistent with normal accounting practices, the initial development costs for this capital project will be considered construction work in progress ("CWIP") and accrue all appropriate carrying charges.

The Company will provide an update on this project in its update filing, if applicable, if there are any changes to the expected schedule.

VI. TECHNOLOGY ENABLERS

Q. Is the Company planning on undertaking projects/programs to enable new technology and enhance existing technology?

A. Yes. As discussed earlier, the Company has four categories of projects associated with Technology Enablers. They are Data Analytics, Cloud Services, Digital Factory, and Robotics Process Automation.

Q. Has the Panel prepared an exhibit describing the enabling technology programs the IT Department will be undertaking?

A. Yes, Exhibit_(IT-3) entitled, Technology Enablers, consists of seven whitepapers and was prepared under our direction and supervision.

Q. Please describe the forecasted capital and incremental O&M request for each rate year under the Technology Enablers.

A. The RY1 capital request is $3.2 million, the RY2 capital request is $6.1 million, and the RY3 capital request is $2.9 million (*i.e.*, $12.2 million in total over the period 2022-2024). The RY1 O&M request is $0.5 million, the RY2 O&M request is $0.7 million, and the RY3 O&M request is $0.7 million (*i.e.*, $1.9 million in total over the period 2022-2024).

A. Data Analytics

Q. Please describe what is involved in data analytics.

A. Data analytics uses quantitative and statistical techniques to gain insights into data that answer complex problems to improve operations, inform conclusions, operate more effectively, prevent and predict issues and reduce costs.

Q. Please provide an overview of the Company's data analytics program.

A. The Company's data analytics program focuses on optimization, support, and governance of the Company's collective investments in advanced analytics. In 2017, the Company launched the Enterprise Data Analytics Platform ("EDAP"), a Company-wide central repository for data and analytics needs, to support the deployment of AMI and processing of AMI interval data. Since the launch of EDAP, it has included 20 additional data sources.

The Company continues to invest in this platform and expand EDAP's capabilities by consuming an additional 30 data sources and provisioning modern data tools in Microsoft Azure. These tools, such as Azure Data Bricks, Key Vault and ML, will deliver a platform that allows the Company to focus development efforts on essential data and quickly evolve to meet business needs.

An expanded EDAP will address a variety of data and analytics needs, including access to raw data, reporting, self-service, predictive analytics, and cognitive services. Additional investments are needed to leverage existing self-service tools, such as Microsoft Power Business Intelligence. These investments will enable the business organizations to perform data analytics as a self-service.

Q. Does the data analytics program address Company priorities and benefit customers?

A. Yes. The program enables the Company to implement foundational technology that can support our customers energy needs. For example, these efforts allow the ability to model energy consumption behavior and deliver personalized services, thereby improving the customer experience and lowering customer energy usage. In addition, the projects executed through the analytics program support key Company priorities by improving safety and operational excellence. This will be accomplished by providing business organizations tools to enable automated decision making.

B. Cloud Services

Q. Please explain the transformational category, Cloud Services.

A. The Company is increasingly relying on cloud services which play a large part in its IT strategy. Whether implemented for process efficiencies, speed to market, redundancy or resiliency, or cost savings, the cloud provides expanding capabilities that the Company is leveraging. Cloud solutions provide the opportunity to reduce hardware and software licenses as the vendor can provide server and computing capabilities without O&R having to procure, manage, maintain, and upgrade this equipment. In addition, this arrangement provides flexibility because the cloud provides resources for certain required workloads that use internal data centers resources as needed, such as DR servers.

Key areas where the cloud will improve processes, provide innovative technologies, and potentially reduce total cost of ownership are:

- Data center consolidation;
- Enterprise application migrations, including Microsoft 365, Oracle and storm applications;

- Clean energy technologies deployment – beneficial electrification, Distributed Energy Resources Management System ("DERMS"), electric and gas system peak reduction using AMI infrastructure; and
- Technology obsolescence.

Q. Turning to the first project, please summarize the data center consolidation initiative.

A. As discussed earlier, Con Edison and O&R share and maintain eight data centers that are used to support all business areas. As part of the data center consolidation strategy, Con Edison and O&R have successfully closed two data centers over the last two years and expanded to a colocation facility. We currently have a goal to consolidate to three data centers for both Con Edison and O&R by 2023. This effort will both reduce O&M costs by consolidating the data center footprint and modernize the new data center infrastructure to the latest technology stack that provides higher computing capacity at lower physical footprint. In addition, the consolidated and updated data centers will improve performance, infrastructure, and supportability.

Q. Turning to the next project, please summarize the Microsoft Office 365 E5 platform.

A. Microsoft Office 365 E5 ("M365 E5") is an example of SaaS software, *i.e.*, licensed software offered on a subscription basis and centrally hosted and supported by the vendor, that has changed the way users operate through improved security, collaboration, the ability to deploy applications in days and provide improved productivity and DR. From a cybersecurity posture, M365 E5 provides advanced threat protection and intelligence as well as advanced compliance and security management capabilities. It also

provides a cloud application security tool for advanced visibility and control in cloud-based applications and information protection solutions.

In 2020, the Company purchased the M365 E5 licenses for all employees for a five-year period, *i.e.*, 2020 through 2024. Because the purchase of these licenses is for both Con Edison and O&R, O&R is charged an allocation of the M365 E5 capital and O&M charges. The Company is requesting capital funding of $1.9 million to cover the allocation of capital costs to O&R. These costs are captured in the Confidential M365 E5 whitepaper included in Exhibit __ (IT-3). The O&M portion of the enterprise Microsoft contract, approximately $1.2 million, will be allocated over the life of the contract extension (from 2024 through 2028). These costs are captured in the IT Hardware/Software O&M whitepaper included in Exhibit __ (IT-3).

Q. Please summarize the Oracle Enterprise Business Suite ("EBS") and BI project.

A. The Oracle EBS and BI platform applications are used across Supply Chain, Finance and Human Resources ("HR"). Oracle's strategic direction is to migrate many, if not all, products to the cloud. Therefore, the Company needs to migrate all on-premises solutions to the Oracle SaaS platform. Effectively, Oracle's support change means that if the Company chooses to remain with on-premise software, this software will experience a time lag in bug fixes and eventually will not be enhanced. If the Company does not perform this migration, supply chain and finance operations will be susceptible to delays in enhancements and bug fixes. It will also require periodic and costly upgrades to the local software.

Q. Please describe the forecasted capital and incremental O&M request for each rate year under the Oracle EBS and BI project.

A. The RY1 capital request is $0.4 million, RY2 capital request is $3.67 million, and RY3 capital request is $0.22 million. (*i.e.*, $4.23 million in total over the period 2022-2024). There are no incremental O&M requests associated with this project during the deployment phase of the project.

Q. Please summarize the Oracle Human Capital Management ("HCM") project.

A. Similar to the EBS and BI projects, the HCM project will migrate the Company's current on-premises Oracle/Peoplesoft's HCM application to Oracle's SaaS platform. These applications are used for many HR related functions, including payroll. The HCM project will further consolidate HR-related systems to a single platform, provide mobile-enabled functions, improve compliance reporting, and develop more advanced and predictive workforce analytics. This project is similarly being undertaken based on Oracle's cloud migration strategy.

Q. Please describe the forecasted capital and incremental O&M request for each rate year under the HCM project.

A. The RY1 capital request is $1.82 million, and RY2 capital request is $1.53 million with no capital request for RY3 (*i.e.*, $3.35 million in total over the period 2022-2024). There are no incremental O&M requests associated with this project.

Q. Please summarize the Oracle Primavera project.

A. The Company is implementing Primavera on Oracle's existing SaaS platform. Oracle's Primavera program tracks and manages schedule and budget compliance for capital

projects. Primavera is expected to improve enterprise project management capabilities for capital construction projects at the Company. Primavera will support improved schedule management, cost management, contract management, project lifecycle governance, and document management.

Q. Please describe the incremental O&M request for each rate year under the Oracle Primavera project.

A. The incremental O&M request associated with this project include $0.16 million in both RY2 and RY3.

C. Digital Factory

Q. What is the transformational category, Digital Factory?

A. Mobility is the ability to use devices to access business systems on the go. The Company continues to focus on digital transformation and expanding capabilities. This digital transformation is changing how the Company interacts with its customers and employees, developing enterprise-wide IT capabilities to integrate, secure, deploy, maintain, and monitor product solutions using mobile platforms. For example, the newly released Site Safety Application provides Company employees tracking, transparency, and reduces travel time and uncertainty during Storm Emergency events. The application serves as a critical tool for those employees engaged in Wire Guard activity to maximize resources assigned to watch and protect the public from down wires during storms.

Q. How is the Company implementing this digital transformation?

A. The Company has established a dedicated team to support digital transformation, called the Digital Factory.

Q. Please explain the Digital Factory.

A. The Digital Factory is the Company's digital transformation program. It has introduced an iterative software development methodology, including new roles and ways of working to support the Company's need to build applications.

Q. Please describe the forecasted capital and incremental O&M expenditures for each rate year associated with the Digital Factory project.

A. The RY1-RY3 capital forecast is $1 million in each year (*i.e.*, $3 million in total over the period 2022-2024). The incremental O&M forecast is $0.11 million in RY1, and $0.22 million in both RY2 and RY3 (*i.e.*, $0.55 million in total over the period 2022-2024).

D. Robotics Process Automation

Q. What is the transformational category, Robotics Process Automation ("RPA")?

A. RPA is an emerging business process automation technology. It is based on the concept that software "robots" can mimic the action humans perform on a workstation. It automates a business process which could require access to several applications, thereby reducing the need for complex and costly system integrations.

Q. How does the RPA technology category assist the Company in meeting its' key objectives?

A. RPA allows the Company to improve the customer experience, operational excellence, and reduce costs. On the customer experience side, as an example, a bot can aid a customer in navigating and completing a transaction with helpful prompts or suggestions that are generated by detecting what the customer is doing in real time. RPAs can improve operational excellence by reducing errors and enforcing strict adherence to

procedures. Finally, RPAs can also reduce costs by assisting customers during non-business hours.

VII. INFRASTRUCTURE

Q. Are there projects and programs associated with the Company's existing IT related infrastructure?

A. Yes. There are several initiatives designed to expand, maintain, and modernize the existing infrastructure. These are categories of expenses where projects can draw from but based on the cost, they are grouped together.

Q. What key objectives are addressed through this category of work?

A. These projects, including data communications bandwidth expansion, mobile radios, Supervisory Control and Data Acquisition ("SCADA") communications, hardware and software deployments and upgrades as well as enhancements, are operationally required to maintain and operate the network infrastructure, data centers and enterprise platforms. They improve the customer and employee experience and operational excellence by enabling proactive upgrades and enhancements. The infrastructure currently in place consists of a high-capacity network, designed to meet the Company's data requirements over the next several years. As utility automation initiatives continue to grow under Grid Modernization, the existing infrastructure will need to expand or be upgraded to secure and meet the bandwidth requirements associated with these new technology initiatives.

A. Network Infrastructure

Q. Please describe the forecasted capital expenditures for each rate year under the network infrastructure.

A. For network infrastructure upgrades, the RY1 capital forecast is $1.34 million, RY2 capital forecast is $2.35 million, and RY3 capital forecast is $2.13 million (*i.e.*, $5.82 million in total over the period 2022-2024).

Q. Please describe the components covered under the network infrastructure.

A. The Company owns and operates a private network infrastructure, which is used to transport corporate data, voice, and SCADA data securely to where it is consumed. This network is comprised of Company-owned fiber optical cables, optical equipment Voice over Internet Protocol ("VoIP") and telephone systems, data communication infrastructures and private Federal Communications Commission licensed microwave and radio systems. This program provides for continued growth and reliability.

Q. Are there expected benefits for safety, operational excellence, and customer experience for this network infrastructure equipment?

A. Yes. The Company's network infrastructure provides a safe and secure high-speed communications network to our corporate locations, such as data centers, electric and gas control centers, substations, contact centers, and field workout locations for radio systems, telemetry, feeder protection, and control of our energy delivery systems. As part of this project, we maintain, upgrade and expand the infrastructure as required to support and secure critical data for the business.

B. Data Center and Enterprise Platform

Q. Please explain the proposed data center and enterprise platform upgrades.

A. In addition to networks, there are six capital programs supporting critical computing components which provide the means for Company employees to communicate and access business systems.

Critical computing components in this category include: the mainframe, servers, storage, desktops, tablets, laptops, mobile data terminals, storage, network equipment related to data centers and internet-facing technology improvements to allow remote access. Upgrades are required to provide a reliable and accessible environment for critical resources located in data centers and to support server growth from new business system projects. Other equipment includes Uninterruptable Power Supply devices, network cabling, wireless networks, and the fiber channel networks used for electronic storage.

Q. What costs are associated with this category?

A. For data centers and enterprise platform upgrades, the RY1 capital forecast is $2.86 million, RY2 capital forecast is $1.91 million, and RY3 capital forecast is $2.86 million (*i.e.*, $7.63 million in total over the period 2022-2024).

C. Mainframe

Q. Is O&R projecting to do work on the mainframe even though it plans to eliminate the mainframe?

A. O&R intends to upgrade the IBM mainframe and infrastructure expansion programs, by purchasing a new mainframe central processing unit to maintain technical currency of the environment. However, this upgrade is critical because the O&R mainframe supports major applications, such as CIS and WMS, which must remain in service until they are

replaced. In addition, it is the primary disaster recovery backup for the Con Edison mainframe environment.

Q. Please summarize the O&M costs associated with the mainframe upgrade.

A. For mainframe programs, the associated O&M costs in RY1 are $0.40 million, RY2 are $1.5 million, and RY3 are $1.6 million, (*i.e.*, $3.5 million in total over the period 2022-2024).

Q. What do these costs include?

A. Costs include required mainframe software maintenance and capacity on demand requirements. The software maintenance includes software updates and upgrades, including patches, fixes, security updates. The software maintenance requirements include the various software products, including, IBM and others, necessary to operate the critical business applications hosted on the mainframe environment as well as software updates and upgrades, including patches, fixes, security updates. These software product contracts are renewed annually and usually have an increase in pricing of 5-7 percent included in their renewal quotes each year.

D. Other Infrastructure

Q. Please describe the remaining infrastructure programs.

A. The remaining programs support desktop infrastructure, enterprise applications, and collaboration tools.

The desktop infrastructure program enables the standardization of the desktop set of tools that incorporate the latest technology to improve security, productivity, efficiency, and collaboration while providing ease of use and access from any device. The standard

operating system ("OS") is the cornerstone to the business systems and data used at O&R. Windows 10 deployment is the current desktop standard. Business system upgrades that are necessitated by underlying changes to the operating systems are also included in this program. Application remediation, if needed, to provide compatibility with a modern OS is also included in this program.

Enterprise application upgrades support the enterprise in a variety of functions. Enterprise applications enable core business and information technology functions. These include maintaining the Intranet infrastructure and secure file exchange, security for user accounts, infrastructure management, and load balancing.

Finally, collaboration tools, such as multi-factor authentication and mobile device management solutions, provide an environment for employees to collaborate and communicate securely using the latest tools.

Q. Does the overall infrastructure category address the Company's key objectives?

A. These proposed upgrades help maintain corporate assets that support all applications and enable us to serve the customer. They also promote performance and security improvements. Due to the rapid advancements in technology and growth in automation, it is critical to refresh programs across the various Company IT platforms.

These programs are also important for protecting against vulnerabilities, which would be at risk if not kept at current security levels.

The programs under the infrastructure budgets support:

- Safety – private wired and wireless communications which provide isolation from public sources of vulnerability and enable the Company to respond rapidly to

emergency situations and critical incidents over secure and segmented channels. These private communication systems provide reliable performance and the highest priority for life-sustaining alerting and feeder relay protection. The equipment will be maintained in a vendor-supportable state and refreshed prior to its end-of-life cycle, which includes periodic security patches and hardware upgrades through our purchasing channels.

- Operational Efficiency – the communication, data computing, and networking infrastructure provides a stable and efficient platform for the applications and processes used by the various operating businesses to achieve and maintain high levels of efficiency around telemetry, applications used by customer-facing personnel, workout locations, and backhaul from field assets.
- Customer Experience – the customer-centric applications and voice communication systems used in the customer contact centers depend on the capital improvements work in our datacenters, wide and local area networks, and communications applications to provide a secure and reliable experience. This program addresses the need to meet current customer expectations for more information delivered in a variety of easily consumable formats such as mobile platforms, while also maintaining the security, integrity, and confidentiality of sensitive customer information.

Q. Does this complete the Panel's direct testimony?

A. Yes, it does.

Cybersecurity White Paper

CONFIDENTIAL*

*Will be distributed to appropriate parties pursuant to a protective order

Exhibit IT-2

Table of Contents

White Papers

Operations and Customer Operations
2020-2024

1. Project / Program Summary

Type: ☒ **Project** ☐ **Program**	**Category:** ☒ **Capital** ☐ **O&M**
Work Plan Category: ☐ **Regulatory Mandated** ☐ **Operationally Required** ☒ **Strategic**	
Project/Program Title: Mainframe Elimination	
Project/Program Manager: Janice Ciocci	**Project/Program Number (Level 1):** 23890639
Status: ☐ **Initiation** ☐ **Planning** ☒ **Execution** ☐ **On-going** ☐ ☐ **Other:** _____	
Estimated Start Date: 09/01/2020	**Estimated Date In Service:** 12/31/2024
A. Total Funding Request ($000) Capital: $2,423,900 (2022-2024) O&M: $0	**B.** ☐ **5-Year Gross Cost Savings ($000)** ☐ **5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:** *Cost Avoidance will occur after all applications are off the mainframe
C. 5-Year Ongoing Maintenance Expense ($000) Capital: $2,970,900 (across 5 years) O&M: $0	**D. Investment Payback Period: (Years/months) (If applicable)** TBD

Work Description:
This project aligns with the IT Department's governing principle of "Excel at the Basics" to modernize core IT systems due to technology obsolescence. This is part of a strategic roadmap to eliminate reliance on the mainframe infrastructure. This program will modernize 14 applications in support of Customer Operations, Finance, and other areas, as well as the associated infrastructure. These applications provide significant business value and streamline business processes. They are challenging to support due to the current technology. The database in these applications will be upgraded from DB2 to an enterprise server solution using Oracle/SQL Server. Web-based application source code will be refactored to meet the new databases standards.

High Level Schedule
This chart below represents the high level schedule for the 14 applications. The schedule is staggered based on resource and other project constraints. For example, the bulk of the Customer Operations application development may not start until 2023 due to the CORE project.

O&R M/F Dependent Systems	2020	2021	2022	2023	2024
Conference Center Reservation System (CCRS)					
Distribution Generation Planning (DGP)					
Recycling					
Payroll database/files					
Gas and Electric Meters (GEMS) database/files					
Walker GL, AP, PO, IM (database)					
Road Opening Permit (ROPES)					
CE Road Opening Permit (CE-ROPES)					
Streetlight Repair					
Ditch Repair Order (DRO)					
Project Center					
Lighting Console					
Field Order Route Design (FORD)					
New Construction System (NUCON)					

Justification Summary:
With this strategic project, the Company aims to modernize a portion of its application portfolio to address technology obsolescence and avoid long-term annual mainframe costs associated with hardware refreshes, software licenses, labor, and disaster recovery safeguards. Leveraging enterprise server solutions will aid to strengthen Company processes with standardized platforms.

The applications to be modernized provide significant business value and aid in productivity. This includes several customer applications that are instrumental in enabling the New Business department, for example, to efficiently manage projects, streamline road opening permits, design routes of travel to perform jobs at customer premises, and manage ditch repair orders. Other examples include aiding the System Operators in obtaining generator commitments from the NYISO and aiding the Corporate Accounting department in building legacy accounts for marketers. Investing in this initiative will aid in sustaining system reliability and maintainability.

Once the CORE project is implemented in 2024, multiple Customer systems reliant on the mainframe will be decommissioned. The mainframe will no longer be a cost effective platform for the systems that remain. In addition, the Con Edison mainframe is planned to be eliminated in 2024, after implementation of the CORE project. O&R relies on the Con Edison mainframe for the Mainframe Workload Recovery Process (MWRP) for disaster recovery purposes. O&R will incur additional costs after 2024, for continued support of the O&R mainframe and for a disaster recovery solution. It is strategic for O&R to take steps to eliminate reliance on the O&R and Con Edison mainframes.

Resources to support mainframe infrastructure and technology are becoming scarce. Modernizing applications reduces risks in system maintainability with access to a larger pool of resources and enhances staff retention through the use of newer technologies (*e.g.*, Oracle, SQL Server). Leveraging an enterprise technology aids in speed and flexibility in addressing business requirements, such as for new system integrations, when compared to leveraging obsolete technology.

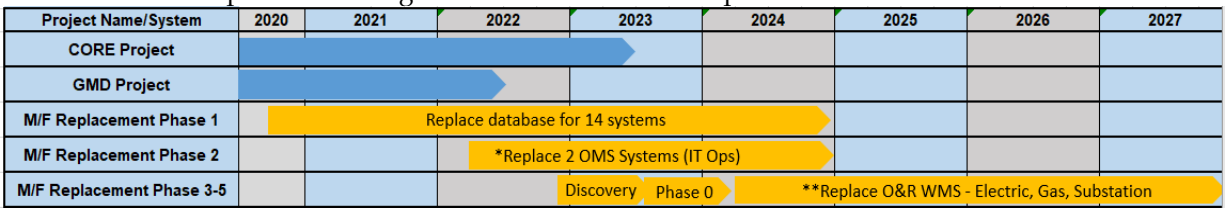
Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Long Range Plans
The Company has developed a roadmap for eliminating system reliance on the mainframe infrastructure. This Mainframe Elimination project is the first phase in a five-phase approach for

modernizing mainframe dependent applications. Subsequent phases (Phases 2-5) listed below will be addressed as separate projects.

- **Phase 1 – Applications primarily requiring database upgrades (14 apps)**
- Phase 2 – Outage management applications to potentially be rewritten or consolidated into an enterprise solution (2 apps)
- Phase 3 – Electric work management applications* to be consolidated into an enterprise Work Management solution
- Phase 4 – Gas work management applications* to be consolidated into an enterprise Work Management Solution
- Phase 5 – Substation work management applications* to be consolidated into an enterprise Work Management Solution

* There are 15 work management applications associated with Phases 3, 4, and 5

This chart below represents the high level timeframe for all 5 phases –



* Analysis is pending

**The Work Management replacement (Phases 3-5) is currently represented as one combined approach for electric, gas, and substation and the approach is subject to change.

Risk Mitigation

In association with the risk of unsupported technology in computer systems, the IT goal is to eliminate application reliance upon the mainframe. Executing this roadmap will mitigate the risks.

2. Supplemental Information

Alternatives

Alternative 1 description and reason for rejection

In order to remain current with technology roadmaps and cybersecurity compliance, the only viable option is to continue to perform as expected by modernizing the applications to an enterprise server platform. An alternative to the modernization is to segment the mainframe application for modernization, without having a long-range plan. Each application upgrade could be funded as an individual project, rather than a phased approach. This is far from ideal given the inefficiencies (lack of economy of scale) and the lack of incentive for individual application owners to upgrade.

Alternative 2 description and reason for rejection

Risk of No Action

Risk 1
The Company will assume additional costs for annual mainframe support in the 2025 timeframe for disaster recovery processes, once the CORE system is implemented and Con Edison has retired its mainframe. This initiative aims to reduce the number of years that O&R will be dependent on the mainframe and be subjected to annual mainframe infrastructure costs.

Risk 2
In association with the risk of unsupported technology in computer systems, the IT goal is to remove the reliance of applications upon the mainframe. These applications leverage older technology and resources to maintain mainframe technologies are becoming scarce. This initiative's aim is that the business can continue to rely upon these systems to aid in productivity, efficicies, and overall business value.

Non-Financial Benefits
The project provides for the following -

- Upgrading applications to technology standards so that corporate applications remain operational and secure.
- Increased speed and flexibility during the development process, such as with system integrations, can take place by leveraging an enterprise server solution.
- This initiative aids to enhance IT staff retention and development through the use of newer technologies (*e.g.*, Oracle, SQL Server).

Summary of Financial Benefits and Costs (attach backup)
1. Cost-benefit analysis (if required)
N/A

2. Major financial benefits
This initiative is an initial step to future cost savings on maintenance and support of the mainframe infrastructure, and depends upon eliminating all application reliance on the mainframe infrastructure.

- The current O&M software costs are approximately **$2.3 million annually**, which includes IBM maintenance costs, third-party software, labor costs, hardware maintenance costs, and disaster recovery costs.
- The current capital costs for hardware upgrades are approximately **$1.5 million every 3 years**.
- The Company projects that the annual O&M software costs will be much higher after 2024 with the retirement of the ConEdison mainframe and the need for a new disaster recovery solution.

3. Total cost
State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

The total capital cost for upgrading the fourteen applications is $2,970,900.

Costs by development phase are:
Feasibility – $80,000
Design – $314,000
Development – $1,940,000
Production – $520,000
Hardware/Servers – $116,900

4. Basis for estimate
The estimate is based on historical projects of similar scope.

5. Conclusion

Yes, this project is necessary due to the risks and technology obsolescence of the current systems. It is strategic and proactive to conduct this project. If no action is taken, O&R will continue to invest in on-going annual support costs of the mainframe for a longer timeframe than necessary.

Project Risks and Mitigation Plan

Risk 1 Capital projects, such as the CORE project or GMD Replacement project, could impact the start of some application upgrades due to resource and/or system constraints.

Mitigation plan The schedule factors in the timing of application upgrades of offset this risk.

Risk 2 N/A

Technical Evaluation / Analysis
N/A

Project Relationships (if applicable)

This project is the first phase of a five phase project approach, as documented in this White Paper. The timing of the application upgrades takes into consideration other in-flight or planned projects, such as the CORE project.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
Capital	46.0	501.0	532.8	1114.8	776.3
O&M*					

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2020	2021	2022	2023	2024
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2020	2021	2022	2023	2024
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Corporate Shared Services / Business System Delivery
Rate Year 2022-2024

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☒ O&M**
Work Plan Category: ☒ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: OMS Enhancement (OMS Storm Hardening)	
Project/Program Manager: Gabe Cano	**Project/Program Number (Level 1): 23250081**
Status: ☐ Initiation ☐ Planning ☐ Execution ☒ On-going ☐ ☐ Other: _____	
Estimated Start Date: 01/01/2022	**Estimated Date in Service: Ongoing**
A. Total Funding Request ($000) **Capital: $3,861.4 (2022 to 2024, includes incremental)** **O&M: $1,359M**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $1,386M** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

The use of the Outage Management System (OMS) and associated downstream systems is critical to the Company for the efficient assessment and response to outage incidents impacting service to our customers. Continued enhancements and integration of OMS with other storm systems such as site safety, municipal dashboard, and damage assessment is critical to the timely restoration of outages. The Company continues to make significant improvements in its ability to quickly understand the number of customers impacted by power outages and provide customers with timely estimated times of restoration. During Tropical Storm Isais, which was the second largest storm in the Company's history, the OMS recorded its highest usage, even exceeding the levels seen during Superstorm Sandy. This performance was achieved through a series enhancements and robust testing program deployed for the Outage Management suite of systems). The primary system includes the Network Management System (NMS) which is provided by Oracle Utilities.

Over the course of the next few years, the Company will continue to invest in the OMS to provide high availability during periods of high usage during major storms, as well as enhanced functionality with the integration of Advanced Metering Infrastructure (AMI) data and Advanced Distribution Management System data.

Under the OMS enhancement program, O&R will undertake a software upgrade of the Oracle NMS system to the latest version 2.5. This upgrade will deliver enhanced operator functionality that increases ease of use and additional automation capabilities. This software upgrade is also critical to the continued stability, reliability, and resiliency of the OMS. In addition, the

Company will migrate the on-premise version of the ARCOS Mobile Workbench solution for Damage Assessment to a cloud-based SaaS (Software as a Service) platform. This new cloud-based platform will increase the scalability of the application during major storms increasing the processing volume of damage assessment reports into the outage management system. The Mobile Workbench solution will also replace the Company's on-premise GIS (Geospatial Information System or Mapping system), called NRG system, that is integrated for distribution switching to allow for safe and rapid isolation of distribution circuits during restoration. The Company will also implement a new high availability Oracle OMS hardware environment with new server and database hardware. The new hardware will enable a high availability architecture and enhanced processing capacity via the Oracle Exadata database platform. This will enable OMS to continue to handle the increased data volumes experienced via AMI and self-service outage channels such as text and IVR. Under this program the Company will also implement the Oracle Utility Analytics (OUA) Business Intelligence Analytics platform to improve and enhance outage analytic capabilities and provide a robust outage reporting platform to meet the OMS reporting requirements for all internal and external stakeholders. The Company has also committed to perform semi-annual OMS end-to-end testing to comply with a New York Public Service Commission (NYPSC) requirement that resulted from the Riley/Quinn Winter Storms in 2018. The Company is also replacing the Outage and Incident reporting systems to support the new UED system (Utility Events Dashboard) as required by NYPSC for all NYS utilities. To comply with the new integration standards, the Company will upgrade its systems to deploy the latest technological standards that enable reliable, secure and rapid transfer of outage data.

Justification Summary: Under the OMS Enhancement program, the Company expects to more than double the current hourly processing capacity of outage calls in the OMS. In addition, the hardware/infrastructure upgrade will enable High Availability (HA) architecture mitigating the need for prolonged maintenance outages for software patching, as well as significant reduction in Disaster Recovery (DR) times during failover. To implement the HA architecture, the Company will deploy the new Exadata hardware which is Oracle's latest platform for hosting databases. In addition, the Company will deploy virtual infrastructure (Nutanix) to support the new environments. These platforms will increase system performance and recovery times. The new HA architecture will include additional test environments that closely match production environments and will increase the Company's capacity to undertake additional testing.

The Company continues to leverage cloud-based applications to improve storm system resilience during periods of high usage. The new cloud-based Mobile Workbench solution for the damage systems will allow for scalability, especially during events with expected high usage. The ability for a damage assessor to report back damages directly into the OMS is a critical part of storm analysis and restoration efforts. This current on-premise version of the software is unsupported by the vendor and the software upgrade is necessary to remain current with vendor support and maintenance which is especially critical during major storms.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
A robust OMS platform is a key input to the Company's OMS Storm Hardening initiatives. Key investments in a modern high availability architecture maintain the OMS under peak system usage which is essential during storms of ever-increasing intensity. In addition, the OMS software upgrade will further enhance the user experience and keep the Company current regarding the vendor's product offering.

Following the Riley/Quinn Winter Storms in March 2018, the NYPSC directed all NYS utilities to conduct semi-annual end-to-end testing of their OMS suite of applications. This requirement was added as a Key Risk Indicator for the Company and incorporated in Company's Emergency Response Plan (ERP). Following Tropical Storm Isaias, the NYPSC took this requirement a step further and directed all NYS Utilities to conduct end-to-end testing of their OMS systems simulating an outage impacting 90% of their customers. To meet this new requirement now and into the future, the Company must continue to invest in robust testing environment and processes.

This project will also modernize an antiquated data flow architecture used by the current on-premise solution and will allow the Company to reduce its cyber risk by adopting best practices for data transfer to/from the cloud system, including authentication, credential management, secure data transfer, among others.

2. Supplemental Information

Alternatives
Alternative 1 description and reason for rejection

Delaying the OMS hardware and software upgrade puts the Company at significant risk of not being able to support storm restorations in a timely manner. The new HA architecture is also required to satisfy the new NYPSC requirements for more comprehensive end-to-end system testing. The OMS software upgrade keeps the Company current regarding the vendor's latest product offering. By delaying the software upgrade, the Company will not be able to benefit from additional capabilities or address software bugs in older versions.

Risk of No Action

Risk 1

Please see "Alternatives" section which outlines risks of no action.

Non-Financial Benefits

The OMS is critical to storm restorations and allows the Company to provide timely and accurate status of outages to its customers. Any risk to these systems can adversely impact the Company's ability to restore customers and provide them timely information.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

2. Major financial benefits

The Company will benefit from process improvements and reduced overhead through the reduction of unplanned system outages through system stability improvements, improved incident response, and reduction in future project cost by streamlining current IT environments (simplifying existing environments and leveraging reusable services), implementing better testing strategies (automating testing).

3. Total cost

The total capital project cost will be $4,449,300 from years 2022 to 2024, includes Mobile Workbench (SaaS platform), OMS major software upgrade (NMS 2.5), hardware upgrade including high availability architecture (Oracle Exadata and Nutanix virtual infrastructure), upgrade NRG/GIS system to the ARCOS Mobile Workbench SaaS platform. For the Mobile Workbench upgrade, there will be data migration and support associated costs (includes several interface connectivity along with testing efforts) from the current on prem instance to the Mobile Workbench SaaS solution. In addition, there will be labor expenses (project planning, testing, development, and production related work) during the implementation phase for the initiatives.

For O&M component, in 2022, the maintenance includes support of the UED system (reporting outages/incidents to NYPSC), the hardware maintenance, the cloud outage map maintenance (Kubra Outage Dashboard for external customers, went live in 2020), and OUA Exadata chargeback (Oracle Outage Analytics platform). In 2024, the incremental cost is due to the maintenance fee of Mobile Workbench SaaS platform, in addition maintenance for the virtual infrastructure hardware for the OMS.

4. Basis for estimate
The basis is the Company's historical purchases and prior project implementations, one including the Company's purchases of ARCOS product suites (*e.g.*, ARCOS Callout, Crew Manager). In addition, Oracle and ARCOS vendor quotes for the hardware, virtual infrastructure and the ESDA and NRG (GIS) migration to the ARCOS Mobile Workbench SaaS platform, also the labor associated to these efforts.

5. Conclusion
OMS storm systems are mission critical applications that support storm restoration and incident response. The Company should continue to enable new functionality and enhance the reliability of these systems. The Company's service territory continues to be impacted by severe weather events. Any delays in service restorations can adversely impact customers. The projects being implemented as a part of this program will allow the Company to respond more effectively to storm events.

Project Risks and Mitigation Plan
N/A

Technical Evaluation / Analysis

O&R is committed to developing best practice outage restoration processes and information systems. These processes and systems help facilitate the correct assessment of customer outages, effective restoration planning, and timely return of service to customers. The Company continues to make significant improvement in its ability to quickly understand the number of customers impacted by power disturbances and provide customers with timely information on restoration times. These accomplishments were achieved through a series of process improvements and enhancements including the decision to migrate to the Oracle Network Management System (OMS).

Project Relationships (if applicable)
N/A

3. Funding Detail

O&R Electric	X
O&R Gas	X
RECO	X

	Common Split Percentages				
	A0	C0	E0	01	02
O&R Electric	55.69%	66.93%	76.69%	100.00%	–
O&R Gas	27.51%	33.07%	–	–	100.00%
RECO	16.80%	–	23.31%	–	–

Mark an "X" in each box that applies; the common split percentages noted above will be used unless otherwise indicated.

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital		**$1,027**	**$883.5**	**$1,266.5**		**$1.850**
O&M					**0**	**$76**

Total Request ($000):

Total Request by Year:

	Request 2021	Request 2022	Request 2023	Request 2024	Request 2025
Capital	**$1,158.9**	**$2.182.5**	**$839.1****	**$839.8****	
O&M*		**$333.0**	**$333.0**	**$693.0**	**$693.0**

Capital Request by Elements of Expense:

EOE	2021	2022	2023	2024	2025
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M		**$333.0**	**$333.0**	**$360.0**	**$360.0**
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M
** These amounts are included in the regular project under $1 million summary line in the Accounting Panel Exhibit AP-E5.

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☒ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☒ Strategic	
Project/Program Title: WMS Replacement	
Project/Program Manager: Janice Ciocci	**Project/Program Number (Level 1): 24795161**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 7/1/2023	**Estimated Date In Service: 12/31/2027 (TBD)**
A. Total Funding Request ($000) **Capital:** $10,000 in 2024; TBD in future years **O&M:** $2,000 ($1,000 in 2023 and $1,000 in 2024); TBD in future years	**B.** **☐ 5-Year Gross Cost Savings ($000)** TBD **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** TBD **Capital:** TBD
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** TBD **Capital:** TBD	**D. Investment Payback Period: (Years/months) (If applicable)** TBD

Work Description:
This project is to replace the home-grown Work Management System (WMS) with one of the two enterprise solutions at Con Edison, thereby addressing technology obsolescence and obtaining efficiencies, productivity enhancements, cost savings, and synergies. This initiative is part of a strategic roadmap to eliminate reliance on the mainframe infrastructure.

The Company plans to hire a consultant to conduct an implementation study (Phase 0). As part of the implementation study, the Company will perform detailed analyses to quantify projected project costs and cost savings, outline a project timeline, and identify synergies and benefits. Based on the current schedule, development will begin in 2024 and will take several years to implement. The capital funding in this white paper is a placeholder until more information is obtained from the implementation study.

The WMS is a comprehensive system that processes electric, substation, and gas operations distribution and transmission work from the point of request and design through to completion. The core system is heavily integrated with multiple corporate systems, such as for financial accounting, materials management, payroll and labor distribution, customer information management, and field assets and inspections.

There are approximately 15 work management-related applications to be replaced, which includes a suite of Electric, Gas, and Substation asset and inspection systems. This initiative is a significant undertaking.

Justification Summary:

With this strategic project, the Company aims to modernize the final portion of its application portfolio to address technology obsolescence with the mainframe infrastructure and avoid long-term annual mainframe costs associated with hardware refreshes, software licenses, labor, and disaster recovery safeguards. Leveraging an enterprise solution will aid to strengthen Company processes with standardized platforms.

Implemented in 1991, the core WMS is 30 years old and is written in older legacy technology (*e.g.*, COBOL, CICS, DB2) that is rigid and challenging to maintain. The Company applied enhancements through the years, and a front-end process was built onto the system in 2005. This process relies upon CICS code using a web-bridge for the business logic, which significantly limits development flexibility. The existing system is not equipped to meet future business needs associated with unit-based tracking, scheduling, mobility, and other key functions readily available in more modern Work Management solutions.

Once the Company replaces its existing Customer Information System (CIS), WMS will be the last major Company system dependent on the mainframe. The Company anticipates that maintaining the mainframe for one product will result in additional costs for support, maintenance, and disaster recovery planning.

A Mainframe Elimination project is currently underway to modernize 14 Customer Operations, Finance, and other Company applications as part of the Company's strategic roadmap to remove system dependency upon the mainframe and ultimately reduce costs incurred for the mainframe. This WMS Replacement project is a subsequent initiative in this roadmap and will standardize the remaining applications into an enterprise-wide software system.

In addition to addressing technology obsolescence, the Company anticipates that efficiencies can be achieved by an enterprise solution through capabilities in workforce automation, digital transformation, and automated workflows in the newer technology. Mobile capabilities will aid in productivity gains during the field construction and inspection processes, eliminating reliance on paper that can lead to errors. The application of data science techniques to analyze the behavior of assets allows for working smarter, rather than leveraging the repetitive reliance of time durations in the inspection and replacement of assets.

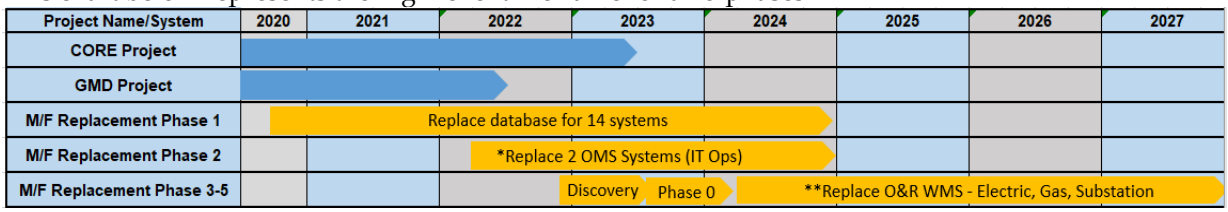
Cost savings can potentially be achieved through other enterprise-proven capabilities and features. The Contractor Administration Group currently relies on manual processes for tracking of contractor work units which could be prone to human error at times. An automated process could aid in greater accuracy. Efficiencies could also be achieved through scheduling optimization features regarding crews and the outstanding work. Service level agreement capabilities, such as for measuring job durations, can result in enhanced customer experiences. Greater insight and decision making can be achieved through customizable dashboards and ease of data access, as opposed to reliance upon the mainframe green screens where there are limitations in the amount of data that can be presented. These are just some examples of potential cost savings, efficiencies, and customer satisfaction gains that require further analysis and confirmation.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Long Range Plans
A roadmap has been defined for eliminating system reliance on the mainframe infrastructure. This WMS Replacement Phase 0 project addresses the last three phases of a five-phase approach for modernizing mainframe dependent applications.

- Phase 1 – Applications primarily requiring database upgrades (14 apps)
- Phase 2 – Outage management applications to potentially be rewritten or consolidated into an enterprise solution (2 apps)
- **Phase 3 – Electric work management applications* to be consolidated into an enterprise Work Management solution**
- **Phase 4 – Gas work management applications* to be consolidated into an enterprise Work Management Solution**
- **Phase 5 – Substation work management applications* to be consolidated into an enterprise Work Management Solution**

* There are 15 work management applications associated with Phases 3, 4, and 5

This chart below represents the high level timeframe for all 5 phases –



* Analysis is pending
**The Work Management replacement (Phases 3-5) is currently represented as one combined approach for electric, gas, and substation and the approach is subject to change.

Risk Mitigation
In association with the risk of unsupported technology in computer systems, the IT goal is to eliminate application reliance upon the mainframe. Executing this roadmap will mitigate the risks.

2. Supplemental Information

Alternatives

Alternative 1 description and reason for rejection:

An alternative is to retain the existing WMS. This approach is not desirable. O&R will continue to invest significant capital and maintenance in the support of a mainframe infrastructure and source code for a limited number of systems. The core WMS relies upon obsolete technology and resources with the required skillset are scarce.

Risk of No Action

Risk 1
The Company will assume additional costs of the annual mainframe support in the 2025 timeframe for disaster recovery processes, once the CORE system is implemented and Con Edison has retired its mainframe. This initiative aims to reduce the number of years that the Company will be dependent on the mainframe and be subjected to annual mainframe infrastructure costs.

Risk 2
There is risk in continuing to support systems that rely upon obsolete technology. WMS is heavily used and relied upon by Operations for their core business. Resources to maintain mainframe technologies are becoming scarce. Addressing production issues, system anomalies, and responding to system inquires can be time consuming due to the technology, and at times, results in manual workarounds being employed. Continuing to invest in an obsolete technology is not prudent.

Risk 3
Cybersecurity is one of the highest risks for organizations of all types. Cyber-attacks have increasingly targeted critical infrastructure providers. Malicious actors have increased their capabilities, and such attacks can cause serious disruption to the operation of the Company's corporate IT network, operational networks, and critical energy infrastructure. In addition, there are increasing threats targeting Sensitive and Confidential information inclusive of customer and employee Personal Identifiable Information (PII). The Company continues to develop and implement enterprise-wide detailed strategies to mitigate these risks.

Non-Financial Benefits

The potential benefits from an enterprise system on newer technology in an enterprise solution include:

- **Mobility: Integration of vehicle GPS data to automate timesheet process.**
  Mainframe applications do not have the ability to leverage real time mobile/GPS technologies. The ability to have a WMS mobile solution would provide time saving capability in the field, removing the need to return to the office to complete WMS work. In addition, a mobile solution could automate the time entry process and help eliminate the need for manual entries by coordinators.

- **Unit-based tracking: Ability to compare Contractor Cost by Unit/Task.**
  Currently WMS does not have the capability to track external labor productivity at a unit level. The ability to compare these costs at a granular level will allow for work assignments to the most cost effective and efficient labor option (contractor vs. internal labor).

- **Scheduling: The ability to view and group jobs/incidents by geographical location.**
  Projects in the current WMS system are sorted only by XY coordinates. Having the ability to view work and assignments geographically in WMS will support dynamic planning, forecasting, and scheduling of work.

- **Modernization of WMS will increase our responsiveness to future regulatory requirements.**
  Complying with past regulatory orders have required significantly more coding than non-mainframe applications. The availability of a flexible Work Management System will allow the Company to make these changes in a timely and less labor-intensive manner.

- **Increased agility, reliability and scalability.**
  Due to the current aging platform, WMS lacks the capacity to provide immediate solutions to business needs. The ability to respond to rapidly changing business requirements by leveraging modern automation and analytics will help reduce human error and streamline system improvements.

- **A modern user interface resulting in more efficient business processes.**
  The mainframe interface requires additional training, onboarding and business support compared to modern applications that have a consistent interface. Modernizing will allow WMS to standardize business processes across groups by incorporating forms, workflows and industry best practices.

Additional Benefits:

- Enhanced safety initiatives can be achieved through provided functionality, such as Operator Qualification Capabilities.
- Increased flexibility in integration with other systems can be achieved.
- Capabilities to analyze variances on projects to help improve business processes can be achieved.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

N/A

2. Major financial benefits

O&R Mainframe

There are cost savings associated with the retirement of the mainframe.

- The current O&M software costs are approximately **$2.3 million annually**, which includes IBM maintenance costs, third-party software, labor costs, hardware maintenance costs, and disaster recovery costs.
- The current capital costs for hardware upgrades are approximately **$1.5 million every 3 years**.
- The Company projects that the annual O&M software costs will be much higher after 2024 with the retirement of the Con Edison mainframe and the need for a new disaster recovery solution, potentially $4.0 million in O&M annually.

3. Total cost

The total estimated cost of this project will be known after the implementation study takes place. Funding is being requested as a placeholder until more information is available.

The initial request is for:

- $1 million in 2023 and $1 million in 2024 (O&M) for the implementation study prior to development.
- $10 million in 2024 (Capital) for development to begin.

This project is anticipated to be a multi-year project and will require the use of system integrators. Consistent with normal accounting practices, the initial development costs for this capital project will be considered construction work in progress (CWIP) and accrue all appropriate carrying charges.

The implementation cost of the CGI WMS enterprise solution at Con Edison was $132 million once fully implemented in 2014.

By leveraging Con Edison's existing enterprise solution and licensing, the Company anticipates that its solution will be less costly compared to the Con Edison implementation. In addition, the Company WMS system contains electronic data, such as compatible unit catalogs, that can potentially be re-used.

4. Basis for estimate
The basis for the initial estimate is a high order magnitude estimate and is loosely based on Con Edison's CGI Enterprise WMS implementation.

5. Conclusion

Yes, this project is necessary due to the risks and technology obsolescence of the current systems.
It is strategic and proactive to conduct this project. If no action is taken, O&R will continue to invest in on-going annual support costs of the mainframe for a longer timeframe than necessary.

Project Risks and Mitigation Plan
N/A

Technical Evaluation / Analysis
N/A

Project Relationships (if applicable)
N/A

This project is a subsequent phase of the Mainframe Elimination Project that runs from 2020-2024. The timing of the WMS Replacement project factors in when the CORE project is finalizing to allow for business and IT resource availability.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital				**$10,000**	
O&M*			**$1,000**	**$1,000**	

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					

M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Exhibit IT-3

Table of Contents

White Papers

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☐ Project ☒ Program	**Category: ☐ Capital ☒ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Cloud Services	
Project/Program Manager: Rich Discuillo	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☐ Execution ☒ On-going ☐ ☐ Other: _____	
Estimated Start Date: 1/1/2021	**Estimated Date In Service:**
A. Total Funding Request ($000) **Capital:** **O&M: $1,735.0**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $2,338.0** **Capital: $4,233.0**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

Introduction

Con Edison and O&R (the Companies) are increasingly relying on cloud services, and these cloud services continue to play a large part in the Companies' IT strategy. Whether for process efficiencies, speed to market, redundancy or resiliency, or cost savings, the cloud provides expanding capabilities that the Companies would like to leverage more. Key areas where the cloud will improve processes, provide innovative technologies, and potentially reduce total cost of ownership are:

- Data center consolidation;
- Data and analytics;
- Enterprise application migrations including Microsoft 365, Oracle and storm applications;
- Clean energy technologies deployment – beneficial electrification, Distributed Energy Resources Management System (DERMS), electric and gas system peak reduction using AMI infrastructure; and
- Technology obsolescence.

Cloud Investments and Opportunities

The Companies have constructed and maintained eight data centers used to support all business areas. As part of their data center consolidation strategy, the Companies have successfully closed two data centers over the last two years and expanded to a colocation facility. The Companies currently have a goal to consolidate to three data centers by 2023. This effort will reduce costs as well as improve performance, infrastructure, and

supportability. The Companies invest in three types of cloud services: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

The majority of IaaS offerings are deployed with a monthly or annual subscription model, as opposed to the capital investment of a data center and associated server and storage hardware. In the IaaS model, the hardware, software and facilities are maintained through a contract with the provider. These services provide scalable solutions which are designed to be provisioned quickly and provide mobility between the service provider and the Companies' facilities offering the Companies control over workload location. With high-computing, resource-intensive projects in progress or recently deployed, (*e.g* Meter Data Management, a new customer system, data analytics, clean energy technology deployments and storm application) using the IaaS model, the Companies are positioning themselves to provide their internal and external customers with needed capacity in an efficient, timely, and cost-effective manner.

PaaS services are similar to IaaS but they contain an additional software layer, such as a database. The upgrade and maintenance of the database are managed by the provider. The Companies are seeing the expanding need for PaaS Services as they migrate their Oracle enterprise platforms, Human Capital Management ("HCM") and eBusiness Suite, to the Oracle cloud, as well as in the data and analytics space. The Companies are currently building their raw data lake – a single repository of enterprise data used for data transformation, reporting, visualization, advanced analytics and machine learning – on Microsoft's Azure cloud. This will improve analytics capabilities in the areas of customer experience and insights, grid modernization, and operational technology, including AMI and sensors. PaaS services, such as Azure Data Factory and Databricks, which are foundational data science and engineering tools, are building blocks for the expansion and modernization of the Companies' data analytics platform.

Finally, SaaS provides licensed software on a subscription basis and is centrally hosted. This area is growing rapidly since many companies are moving to SaaS only models. This software reduces overall cost of ownership, eliminating hardware and software upgrades, as well as the time to deploy, support and maintain applications. An example of SaaS software that has dramatically changed the way the Companies operate is Microsoft 365. It has provided an improved collaboration experience, the ability to deploy applications in days and provides improved productivity and disaster recovery because the applications are accessible from anywhere. In addition to Microsoft 365, there are large application migration projects currently planned. The incremental costs for growth and new services are $249,000.

Oracle Primavera - The Company is implementing Primavera on a cloud-based SaaS platform. The objective of this project is to improve enterprise project management capabilities for capital construction projects at the Company. This will be accomplished through implementation of Primavera to support improved schedule management, cost management, contract management, project lifecycle governance, and document management. The total cloud costs covered in this cloud white paper are $160,000.

HCM -The Company is implementing Oracle HCM Cloud solution on the SaaS platform. The objectives of this project are, to Improve the Employee experience, consolidate disparate HR and Learning and Inclusion (L&I) systems, support enhanced business practices, increase the

efficiency by offering mobile applications, develop advanced workforce analytics, develop a long-term data archive and replace obsolete HR and L&I systems and reduce the need for complex data integrations between systems. The funding for the cloud-based HCM solution is included in the Oracle HCM Cloud Implementation White Paper. The total capital cloud costs covered in the HCM white paper are $3.125 million.

Oracle EBS and BI - The goal is to implement Oracle EBS Cloud and Oracle BI Cloud (SaaS) solutions and retire the existing local ERP and BI solutions. Oracle's strategic direction is to migrate all on-premises solutions to their cloud platform. Oracle is devoting most of their development resources to the cloud, with limited spending on on-premises software. This means that on-premises software will have a time lag in bug fixes and eventually will not be enhanced. If the Companies do not perform this migration, supply chain and finance operations will be susceptible to delays in enhancements and bug fixes. It will also require periodic and costly upgrades to the on-premises software. The funding for EBS is in the Oracle EBS white paper. The total capital cost is $4.322 million.

OMS - The Company will migrate to the ARCOS Mobile Workbench solution for Damage Assessment which is a cloud-based SaaS platform. This new platform will allow the Company to migrate off its on-premise damage assessment solution and will allow for a scalability factor, greatly increasing the processing volume of damage assessment reports into the outage management system. The Mobile Workbench solution will also replace the Company's on-premise GIS (Geospatial Information System or Mapping system), called NRG, allowing for improved stability and reliability of the platform. The aforementioned initiatives are in the "OMS Enhancement" white paper in the EIOP testimony. The total cloud costs covered in the ARCOS white paper for O&M is $180,000.

Cyber Security – The Company is currently planning to migrate to a to a cloud-based VPN solution, replacing the current solution. In addition, we are looking to implement an Identity and Access Management (IAM) Solution. The funding for these cloud-based solutions is included in the Cybersecurity whitepaper. The total cloud costs covered in the cyber security white paper are $309,600 in O&M.

Clean energy technologies- The cloud will help to quickly innovate and meet the demands supporting the Company's clean energy vision. The Company is looking at various cloud technologies for energy efficiency to help in various integrations for electric vehicles and DERMS with third party cloud providers. Advancement of clean energy technologies, such as distributed energy integration into the grid, require integration with customer sited technology systems that is enabled by the cloud.

Justification Summary:

Cloud services provide speed, agility, redundancy, resiliency, and cost savings to the traditional on-premise models. To meet customer needs effectively and efficiently, support the IT strategy and improve the reliability of our systems, the Company must invest in cloud services. It is an integral part of our IT strategy. The Company needs to build customer

facing and operational applications to support hybrid architectures, cloud and on-premise, to ensure the appropriate resiliency.

In addition, data is one of the most important Company assets. The Company needs to be able to use this data to transform the business digitally and support clean energy goals. Cloud is a key enabler for this.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
The cloud will also help in various integrations for electric vehicles and DERMS with third-party cloud providers. Advancement of clean energy technologies, such as distributed energy integration into the grid, require integration with customer sited technology systems that is enabled by the cloud.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.)..

Alternative 1 description and reason for rejection
Continue to build new on-premise data centers. The Company recently built a new data center that cost ~$40 million to support our hybrid cloud model. Although the Company will maintain some data centers on premise, it takes approximately three years to build a facility. Regularly building new data centers is not a feasible model.

Risk of No Action

Risk 1
Delays in deploying IT systems due to capacity limitations.

Risk 2
Inability to support projects that need to quickly deploy or scale resources. In addition, some vendors are moving to SaaS only models.

Risk 3
Decrease in the availability and reliability of Company's systems that support our employees, customer and key stakeholders.

Non-Financial Benefits

- Increased reliability, redundancy, efficiency, and customer satisfaction.
- Increased business agility by deploying new IT systems in a timely fashion to respond to an evolving utility business.

- Increased performance levels and respond to increased capacity and use without interruption.
- Improve disaster recovery through off-site capacity and backup as well as the performance of business systems running.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

Costs are based on known subscriptions costs and anticipated growth.

2. Major financial benefits

Cloud services provide speed, agility, redundancy, resiliency, and cost savings to the traditional on-premise models. To meet customer needs effectively and efficiently, support the IT strategy and improve the reliability of our systems, the Company must invest in cloud services. It is an integral part of our IT strategy. The Company needs to build customer facing and operational applications to support hybrid architectures, cloud and on-premise, to ensure the appropriate resiliency.

In addition, data is one of the most important Company assets. The Company needs to be able to use this data to transform the business digitally and support clean energy goals. Cloud is a key enabler for this.

3. Total cost

Total cost of the program is $1.8 million.

4. Basis for estimate

Costs are based on known subscriptions costs and anticipated growth.

5. Conclusion

To meet customer needs, innovate quickly and provide the necessary resiliency to support our business the cloud is an essential part of the IT strategy

Project Risks and Mitigation Plan

Risk 1 N/A	Mitigation plan
Risk 2	Mitigation plan

Technical Evaluation / Analysis

NA

Project Relationships (if applicable)

This program impacts various Oracle, OMS, cyber security, and clean energy initiatives.

3. Funding Detail

O&R Electric	X
O&R Gas	X
RECO	X

	Common Split Percentages				
	A0	C0	E0	01	02
O&R Electric	55.69%	66.93%	76.69%	100.00%	–
O&R Gas	27.51%	33.07%	–	–	100.00%
RECO	16.80%	–	23.31%	–	–

Mark an "X" in each box that applies; the common split percentages noted above will be used unless otherwise indicated.

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						**$142.0**
O&M	**0**	**0**	**0**	**0**	**120.0**	

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**$0**	**$**	**$**	**$**	**$0**
O&M*	**0**	**$529K**	**$603.0**	**$603.0**	**$603.0**

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total	**0**	**0**	**0**	**0**	**0**

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings	**0**	**0**	**0**	**0**	**0**
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M	0	0	0	0	0
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☒ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☒ Strategic	
Project/Program Title: O&R IT Digital Factory	
Project/Program Manager: Matthew Ruiz	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 4/1/2021	**Estimated Date In Service: 4/1/2022**
A. Total Funding Request ($000) **Capital: 3M (2021 – 2025)** **O&M: 550K**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: 770K (Across 5 years)** **Capital: 5M**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:
As part of Con Edison's and O&R's Digital Transformation, the Information Technology (IT) department is establishing and enhancing the Digital Factory program which brings business units and IT together to build impactful software products for the Company field operations employees and external customers. The Digital Factory will be a key part of Con Edison's and O&R's overall Digital Transformation and will spearhead the development of enterprise-wide IT capabilities to develop, integrate, secure, deploy, maintain, and monitor mobile applications. The Digital Factory will introduce new roles and software development framework using Agile DevOps (Development Operations) methodology to support the Company's growing need to build turnkey applications more efficiently and inexpensively, resulting in safer, more reliable, and more affordable energy for Con Edison's and O&R's customers.

Digital Factory is a program that will operate as follows:

- Design Thinking and user centric approach that will focus on our employees and customers, making them more efficient and automating low value-added work so that our employees can focus on their core skills in addition to streamlining external customer engagement through enhanced self-service functionality and automation.
- Agile development with focus on delivering when a solution is valuable, not wait until the solution is complete so that the business can start realizing benefits earlier and increase capabilities and benefits with frequent releases.
- Business Case model that focuses on cost reducing and revenue generating initiatives that align with the business vision and goals.
- Cutting-edge DevOps technologies and platforms with reusable components that will speed up the development lifecycle.

These platforms will enable shorter development cycles (reducing costs) and increased deployment frequency (process consistency and avoidance of errors) in close alignment with business objectives

(alignment with our cost reduction goals). Additionally, Digital Factory will leverage a user-centric approach that aligns tools to the way real people live and work. The Digital Factory will dedicate IT and business resources to redesign core work processes for safety, reliability, efficiency, and consistency, jointly owning the success of product solutions (lowering change management costs and increasing adoption in the operations groups).

The Digital Factory will also build a new mobile platform of reusable (build once and re-use in multiple products, for example, a login screen) technology components (which will increase deployment speed, development speed, application security, and speed up time to market). The platform will leverage:

- Cloud technology and cutting-edge IT architecture.
- Common application development framework that enables re-use of code and features.
- Catalog of reusable application programming interfaces (APIs) for internal Con Edison and O&R business systems that will enable cross platform applications and deployment across multiple devices (*e.g.*, iOS, Windows) without additional cost.
- Leverage single sign-on for mobile with security controls at platform level vs. application level

Using this approach of Design Thinking, DevOps, cutting-edge technologies and re-usable technology components to develop software products that will drive adoption, process adherence, higher productivity, and higher quality work in the field than the current approach or that is achievable with off-the-shelf products.

Justification Summary:

Mobile technology and advanced analytics are no longer optional, they are required. Recent advancements in software development tools, cloud technology and analytics are increasing and reducing the technology development lifecycle of software products. The Digital Factory is a first step in changing the way technology is deployed at Con Edison and O&R, where IT and the Business are jointly responsible for defining the full functionality of mobile solutions for employees and external customers. The Company initiated this framework for software development under the Digital Customer Experience (DCX) initiative. Under the Digital Factory, Con Edison and O&R will be expanding this enterprise wide. Based on the benchmarking with peer utilities that have leveraged this framework for their cost optimization initiatives, the impact has been significant in reducing the costs of targeted processes by 10-20%, while also improving customer satisfaction, safety, and compliance in various areas.

The Digital Factory will also dramatically alter the way IT can drive value in the business and will work collaboratively with an executive steering committee to build an enterprise mobile roadmap to focus on the highest-impact business processes. Major use cases (and their potential impact through mobile and other digital solutions) could include:

- **Inspection** (decreased drive time, more accurate asset information in the field, mobile documentation, and analytics for reporting);
- **Construction** (more efficient collaboration across operations and engineering, more efficient management of municipalities, permits, and approvals, more efficient and "right-sized" deployment of resources);
- **Job Briefing** (decreased safety violations and risk for our employees);
- **Procedural Documentation** (greater consistency of processes and avoidance of fines);
- **Vehicle inspection** (decreased safety violations and avoidance of injuries and fines);
- **Crew location management** (more efficient routing crews decreasing drive time and increasing dispatch to "shovel-ready" work);
- **New Business** (increased Customer Satisfaction (CSAT) and streamlined permit and approval process);
- **Outage Management – Site Safety and Damage Assessment** (increased CSAT, increased site safety, streamlined corporate communications); and

- **Energy Efficiency Demand Management** (improve sales efficiency, increase customer participation and engagement, greater operational efficiency).

The Digital Factory will implement a business case methodology to evaluate the products that will be part of the scope with ability to calculate and track business benefits. The methodology will consist of:

- **Qualitative Factors such as:**
  - **Support other corporate priorities** (*e.g.*, Safety, Customer Experience, Sustainability);
  - **Business value** of future version after Minimum Viable Product (MVP); and
  - **Employee and customer engagement.**
- **Quantitative Factors such as:**
  - **Cost reduction** (operational or capital costs, internal and external/contractor spend); and
  - **Revenue increase** (*e.g.*, through EAMs: size of pipeline, lead conversion, deal size).

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

2. Supplemental Information

Alternatives

- Alternatives: Current application development methods are slow to deploy applications and slower to capture impact. Smaller, focused mobile solutions require a nimbler approach that the Digital Factory will deliver—Con Edison and O&R could continue to partner with third-party software providers for mobile solutions, but this increases vendor dependency, and these solutions may not completely meet the unique needs of our business. Building our own skills in this area will pay dividends far into the future.

Risk of No Action

- Risk of No Action: Current application development processes do not drive consistent adoption, process alignment, or business impact as quickly. Current IT software development methodology is dependent on third-party technology and proprietary development frameworks Customization to third-party technology and proprietary development frameworks increase development costs and reduce speed to market.

Non-Financial Benefits

- Non-financial Benefits: The Digital Factory offers a number of non-financial benefits to Con Edison:
  - An improved relationship between IT and Business Units, including increased collaboration and a jointly-defined mandate to create impact, which will result in higher work process adherence, easy to use (minimal training needed) products and a more unified organization.
  - A new collaborative, agile culture can help Con Edison and O&R transform its talent base in IT. Con Edison and O&R will be able to recruit cutting edge talent to modernize IT, which can ultimately lead to more efficient, effective, and safe service to our customers.
  - Enterprise-wide standard mobile applications using the new mobile platform will allow greater transparency into costs, scheduling, work status, and productivity metrics through a consistent data platform and advanced analytics engine.

- A number of "micro-apps" for Con Edison and O&R employees that improve their operational efficiency and job satisfaction (e.g., mobile contractor approvals, mobile JSSE, mobile permit management, carpool app, etc.).

Summary of Financial Benefits and Costs (attach backup)

- Summary of Financial Benefits (if applicable) and Costs: Based on the business case methodology and the analysis that we have done so far; Con Edison and O&R are estimating financial savings associated with increase in operational efficiency and streamlining business processes. On average, Digital Factory products save 5%-10% in annual O&M 6 months post MVP. The potential savings may be even greater at the individual product level, as Business Cost Optimization is a foundational factor in any product deployment.

- Basis for Estimate: The estimate of the effort has been developed with the help of a vendor who has done extensive work in this space at other utilities that have gone through digital transformation.

Project Risks and Mitigation Plan

Project Risks include not identifying a suitable use case and business partner for DF within O&R. DF will actively work with O&R BRM to establish business case and partners.

Technical Evaluation / Analysis

- Technical Evaluation/Analysis: The Company has worked closely with its strategy vendor to benchmark against what other utilities and other industries are doing in digital transformation. The Digital Factory approach has proven implementations with benefits realized. The goal of the Digital Factory is to work with latest technologies in the market and to do continuous evaluation of new technologies and how they can be leveraged to increase efficiencies.

Project Relationships (if applicable)

- Project Relationships (if applicable): The Digital Factory will be working closely with the RPA (Robotic Process Automation) CoE and the Analytics CoE and leverage those capabilities in delivering products.

3. Funding Detail

O&R Electric	X
O&R Gas	X
RECO	X

	Common Split Percentages				
	A0	C0	E0	01	02
O&R Electric	55.69%	66.93%	76.69%	100.00%	–
O&R Gas	27.51%	33.07%	–	–	100.00%
RECO	16.80%	–	23.31%	–	–

Mark an "X" in each box that applies; the common split percentages noted above will be used unless otherwise indicated.

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**

Capital				**$307,784**		**16K**
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	Request 2022	Request 2023	Request 2024	Request 2025
Capital	**1M**	**1M**	**1M**	**1M**	**1M**
O&M*					

Request by Elements of Expense

EOE	2021	2022	2023	2024	2025
Labor	$490,000	$541,580	495,000		
M&S					
A/P	$133,600	$135,000	136,600		
Other					
Overheads	$385,000	$388,000	$390,000		
Total	**$1,000,800**	**$1,064,580**	**$1,021,600**		

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M	**0K**	**110K**	**220K**	**220K**	**200K**
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☐ Project ☒ Program	**Category: ☐ Capital ☒ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: IT Hardware and Software Maintenance	
Project/Program Manager: Allisyn Glasser	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☐ Execution ☒ On-going ☐ ☐ Other: _____	
Estimated Start Date: 1/1/2020	**Estimated Date In Service:**
A. Total Funding Request ($000) **Capital:** **O&M: $4,458.0 (RY 2022-2024)**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $7,432 (RY 2021-2025)** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:

The Company makes many technology investments each year for the continued operation of the computing and network infrastructure used to support data centers, applications, and networks. These investments can take the form of productivity improvements, such as new investments in backup solutions, or they are used to assist the continued viability of the environment, including network switches, servers, storage, or personal computers. In either case, the Company protects the investments through a maintenance contract for the hardware and/or software. The maintenance support is used to keep the hardware and software up to date, patch cybersecurity vulnerabilities, replace hardware failures, and take advantage of new release features within the products. This allows sustainability and supportability of the environment over time and increases reliability and availability of the network, business applications and infrastructure. Technology solutions can be purchased through capital investments which include a negotiated maintenance period. Once that period has expired, the contract becomes an expense to the Company, in addition newer solutions may only offer a SaaS model. During the following five years, maintenance on the following products will expire and new expenses for maintenance will begin:

- Increases in PC hardware maintenance due to growth of inventory;
- Cisco network equipment and servers due to network growth;
- Microsoft Enterprise Agreement to maintain server, operating system, integration, and database software versions as well as support;
- Net Back-up and Cohesity server backup solution;
- Virtual Private Network technology upgrade and device mobility growth;
- Nutanix hyperconverged server and storage infrastructure; and
- Nutanix hyperconverged infrastructure and Dell EMC storage infrastructure.

Justification Summary:
The value of the Company's technology investments is maintained through support contracts for its various hardware and software platforms. The support is used to assist during issues, as well as to keep the software up to date, patch cybersecurity vulnerabilities, replace hardware failures, and take advantage of new release features within the products. IT provides critical services and these contracts allow for sustainability and supportability of the environment and increases reliability and availability of the network, business applications, infrastructure, and PCs. These contracts are part of the IT strategy to reduce risk and provide sustainability and supportability of the various platforms. Without having these contracts in place, the Company will incur a significant support risk.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

This program supports future growth, allows for security and support for all application, networks and major initiatives such as AMI, CORE, GIS, Grid Modernization, DCX and the Clean Energy vision.

2. Supplemental Information

Alternatives

Alternative 1 description and reason for rejection
Do Nothing. See below

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action

Risk 1

- Failure to purchase maintenance now will introduce significant risk to the availability of the technology solution and the business functions it provides. It also introduces a cybersecurity risk and compromise the capability to interact with external stakeholders because current equipment will be unsupported.

Risk 2

Risk 3

Non-Financial Benefits

- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among department*

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

- Maintenance typically runs 20 % per year on the original investment.

2. Major financial benefits

- None

3. Total cost

- IT performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IT strategy and vision planning process. Interaction with IT advisors, vendors and Company employees assist in the selection of the optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout.

4. Basis for estimate

- Maintenance typically runs 20 % per year on the original investment.

5. Conclusion

- These types of maintenance agreements are required for the supportability, security and reliability of all our applications and infrastructures.

Project Risks and Mitigation Plan

Risk 1	Mitigation plan
Funding not received as part of the budget process/ Work with finance to understand needs	
Risk 2	Mitigation plan

Technical Evaluation / Analysis

- IT performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IT strategy and vision planning process. Interaction with IT advisors, vendors and Company employees select optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout.

Project Relationships (if applicable)

This program impacts all applications and initiatives.

3. Funding Detail

O&R Electric	X
O&R Gas	X
RECO	X

	Common Split Percentages				
	A0	C0	E0	01	02
O&R Electric	55.69%	66.93%	76.69%	100.00%	–
O&R Gas	27.51%	33.07%	–	–	100.00%
RECO	16.80%	–	23.31%	–	–

Mark an "X" in each box that applies; the common split percentages noted above will be used unless otherwise indicated.

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M	**$822**	**$1,056**	**$1,608**	**$1,221**	**$1,186**	**$1,201**

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital					
O&M*	**$1,321**	**$1,419.0**	**$1,475**	**$1,564**	**$1,653**

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M	$1,321	$1,508	$1,564	$1,653	$1,782
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Corporate Shared Services / IT Engineering and Operations
Rate Year 2022-2024

1. Project / Program Summary

Type: ☐ **Project** ☒ **Program**	**Category:** ☒ **Capital** ☐ **O&M**
Work Plan Category: ☐ **Regulatory Mandated** ☐ **Operationally Required** ☒ **Strategic**	
Project/Program Title: Microsoft 365 E5	
Project/Program Manager: Mikhail Falkovich	**Project/Program Number (Level 1):** 24566671
Status: ☐ **Initiation** ☐ **Planning** ☐ **Execution** ☒ **On-going** ☐ **Other:** _____	
Estimated Start Date: 09/01/2024	**Estimated Date in Service: 12/31/2024**

[Begin Redaction

Redacted

Redacted

End Redaction]

3. Funding Detail

O&R Electric	X
O&R Gas	X
RECO	X

	Common Split Percentages				
	A0	C0	E0	01	02
O&R Electric	55.69%	66.93%	76.69%	100.00%	–
O&R Gas	27.51%	33.07%	–	–	100.00%
RECO	16.80%	–	23.31%	–	–

Mark an "X" in each box that applies; the common split percentages noted above will be used unless otherwise indicated.

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						1,778
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	**Request 2021**	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	1,778	53			1,863	
O&M*						

Capital Request by Elements of Expense:

EOE	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor						
M&S						
Contract Services						
Other	1,778	53			1,863	
Overheads						
Total	1,778	53			1,863	

Total Gross Cost Savings / Avoidance by Year:

	2020	2021	2022	2023	2024	2025
O&M Savings						
O&M Avoidance						
Capital Savings						
Capital Avoidance						

Total Ongoing Maintenance Expense by Year :

The O&M for the Enterprise Microsoft Contract project is captured in the Hardware/Software O&M whitepaper.

	2020	2021	2022	2023	2024	2025
O&M						
Capital						

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Shared Services /Information Technology
2022 - 2024

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☒ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Mainframe & Infrastructure Expansion	
Project/Program Manager: Andrew Donegan	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☐ Execution ☒ On-going ☐ ☐ Other: _____	
Estimated Start Date: 01/01/2022	**Estimated Date In Service: Ongoing**
A. Total Funding Request ($000) **Capital: $3,310.1** **O&M: $6,875.00**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $11,455.0** **Capital: $4,113.6**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:	The O&R mainframe environment supports critical corporate applications including the Customer Information Management System (CIMS), Work Management System (WMS), Outage Management System (OMS), and a number of other production processes supporting the day-to-day business of O&R. Included on the O&R mainframe are the development, test, and user environments, supporting the BSD application development staff in their efforts to maintain the current state, and deliver new technology to the business units of O&R. The O&R mainframe functions as the disaster recovery platform for the CECONY mainframe environment. Both mainframe systems function as an alternate recovery site during a system event (Disaster) impacting the operational environment at either location. The O&R mainframe is also used for testing copies of the production environment to validate system and application changes/upgrades prior to migrating to a live production environment. To support the O&R mainframe environment, there are many system software products that are renewed each year. The 2022 Capital request is to refresh the IBM CPU to keep it current with latest software and maintenance agreements. These software product companies include IBM, Broadcom, BMC, Macro4 and Proquire. These products support the O&R Mainframe Operating environment including O&R daily processing and are entitled to receive software updates and upgrades, including patches, fixes, security updates.

	These software product contracts are renewed annually and usually have an increase in pricing of 5-7% included in their renewal quotes each year. The IBM Capacity on Demand feature for the O&R Mainframe is used to raise the O&R Mainframe CPU Capacity during Storm events when transaction volume is raised to very high volumes due to outages from the Storm Event. The O&R mainframe environment supports critical corporate applications including the Customer Information Management System (CIMS), Work Management System (WMS), Outage Management System (OMS), and several other production processes supporting the day-to-day business of O&R. The Capacity on Demand feature would only be used to support the Storm event volume, which typically last five to seven days.
Justification Summary:	These Software products and Hardware refresh are needed to maintain the O&R Mainframe Operating environment as well as Application support Staff needs to effectively support CIMS, WMS, OMS, and a number of other production processes supporting the O&R business. These products also support our primary Disaster Recovery Program Mainframe Workload Relocation (MWRP) process. We acquire Capacity Backup software with the additional CPU purchase that allows to increase the processing power of the IBM CPU to support both the O&R and CECONY workloads simultaneously during Mainframe Workload Relocation events. The Capacity on Demand feature is needed to support raised mainframe workloads volumes during extreme Storm events where we are experiencing numerous outages in our support areas. The Capacity on Demand feature allows us to reach our application goals mandated by outside agencies during this extreme Storm events.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
All the above-described products support on a daily basis the O&R Applications environments: CIMS, WMS, OMS. They also support our primary MWRP process. We acquire Capacity Backup software with the additional CPU purchase that allows to increase the processing power of the IBM CPU to support both the O&R and Con Ed workloads simultaneously during Mainframe Workload Relocation events.

The Capacity on Demand feature when enabled would support daily operations of O&R Applications environments: CIMS, WMS, OMS during a storm event when there is a peak usage of the existing mainframe CPU and its related subsystems.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.).

Alternative 1 description and reason for rejection

Do nothing – see risk of no action below.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

N/A

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1
Potential mainframe performance issues for CIMS, WMS, OMS, and production batch workloads supporting our current O&R System and Application environments without these third-party software renewals.

Potential mainframe performance issues for CIMS, WMS, OMS, and production batch workloads supporting our current O&R System and Application environments during extreme storm events without this Capacity on Demand feature.

Risk 2

Risk 3

Non-Financial Benefits

Reliability, Availability, and Serviceability (RAS) would be realized with the renewals of these System and Application Software renewals.

Reliability, Availability, and Serviceability (RAS) would be realized with the purchase of the Capacity on Demand feature during extreme storm events.

Summary of Financial Benefits and Costs (attach backup) N/A
Project Risks and Mitigation Plan *N/A*
Technical Evaluation / Analysis N/A
Project Relationships (if applicable) N/A

3. Funding Detail

O&R Electric	X
O&R Gas	X
RECO	X

	Common Split Percentages				
	A0	C0	E0	01	02
O&R Electric	55.69%	66.93%	76.69%	100.00%	–
O&R Gas	27.51%	33.07%	–	–	100.00%
RECO	16.80%	–	23.31%	–	–

Mark an "X" in each box that applies; the common split percentages noted above will be used unless otherwise indicated.

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M	**1,620.8**	**1,830.1**	**1,719.4**	**2,001.8**	**1,785.8**	**1,900.0**

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**303.5**	**1,491.3**	**369.8**	**1,449.0**	**500.0**
O&M*	**2,185**	**2,185**	**2,295**	**2,395**	**2,395**

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☒ Strategic	
Project/Program Title: Oracle EBS Cloud Migration ORU	
Project/Program Manager:	**Project/Program Number (Level 1): 23939151**
Status: ☐ Initiation ☒ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 9/1/2022	**Estimated Date In Service: 7/1/2024**
A. Total Funding Request ($000) **Capital: $4,233** **O&M: $70**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:

The goal is to implement Oracle EBS Cloud and Oracle BI Cloud (SaaS) solutions and retire the existing local ERP and BI solutions. For Oracle EBS, all business requirements will be reviewed and validated. Any gaps in functionality will be evaluated and solutions determined. Adoption of Cloud applications requires standardized processes, so it is expected that most gaps should be resolved by configurations.

The Oracle EBS System has 477 specific modifications to the base system, which need to be evaluated and tested. These modifications change the way the system works to conform to Con Edison's business practices.

115 Functional Extensions
113 Inbound Interfaces
81 Outbound Interfaces
141 Custom Reports
27 Custom Workflows.

Testing will include all finance and supply chain functions as well as all interfaces to other Con Edison systems and external systems such as banks and vendors.

The information currently stored in the on-premises EBS system will be converted to Oracle's cloud solution. For Oracle BI, all business reports and data models will need to be reviewed to determine the required rework. Most of the information will continue to come from Oracle EBS which will also be on Oracle's Cloud. In addition, the Oracle BI on-premise solution will need to upgrade to maintain vendor support. This will be done in 2021.

Justification Summary:

Oracle's strategic direction is to migrate all on-premises solutions to their cloud platform. Oracle is devoting most of their development resources to the cloud, with limited work and spend for local software. This means that on-premises software will have a time lag in bug fixes and eventually will not be enhanced.

If Con Edison does not perform this migration, supply chain and finance operations will be susceptible to delays in enhancements and bug fixes. It will also require periodic and costly upgrades to the local softwareIn addition, Consolidated Edison Inc. entered an Oracle Strategic Partnership (OSP which aligns with Con Edison's strategic business cost optimization, enhances operational efficiency, and improves customer experience through technology innovation.

The OSP allows the Company to use Oracle on-premise and cloud solutions at a specified O&M maintenance costs for these services.

On-premise software is available under the Perpetual Unlimited License Agreement (PULA) within the OSP. The PULA lets Con Edison have unlimited use of Oracle software used by utility companies. This includes products such as Oracle EBS, Oracle BI, Hyperion, PeopleSoft Financials as well as Payroll and Recruitment. It also includes technology software such as database and backup software.

Cloud solutions cover utility specific products, such as OPower for Behavior Energy Efficiency and AMI enablement. Also included are general business cloud products such as Primavera.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

Eliminate the need to upgrade the on-premises application which should happen every 2 to 3 years. This would also eliminate the need to upgrade the servers every 5 or 6 years.

2. Supplemental Information

Alternatives

Con Edison could maintain the current local solution or delay the migration to the cloud. These alternatives would require Con Edison to maintain a technical support staff as well as maintain on-premises infrastructure such as storage, networking, and servers.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action

Con Edison's investment in the Oracle EBS would depreciate as Oracle devotes more time and resources to their cloud solutions relative to their on-premise solutions. Although the on-process Oracle EBS would continue to work, it will not improve as quickly as the cloud solution. This reduce the operability of the Oracle EBS system

Risk 2

Risk 3

Non-Financial Benefits
Oracle's current cloud user interface has a modern look and feel. During the next few years, the cloud product will continue to evolve and improve. The timing of the project will provide Con Edison with a mature yet modern solution. One example is the standardization of work flow approvals in the cloud. The on-premise Oracle EBS has different method of implementing workflows which increase the system complexity and cost. The cloud version has a simpler and more efficient workflow process. This would help to speed ordering, receipting of goods, and payments

Summary of Financial Benefits and Costs (attach backup)

Eliminate the need to upgrade the on-premises application which should happen every 2 to 3 years. This would also eliminate the need to upgrade the servers every 5 or 6 years.

- 1 Technical Evaluation/Analysis:
  The technical evaluation will be done during the phase zero section of the project in 2021.

- Project Relationships (if applicable):

- Basis for Estimate:
  The cost estimate was based on the initial Oracle EBS and BI installation with adjustments needed to account for reduced hardware and software licenses.

  The O&M costs were estimated from historical costs and then projected forward. These were augmented with the planned increases due to future uses of the Oracle software products. These costs were then included in the negotiated Oracle Strategic Partnership (OSP).

5. Conclusion
The current EBS application will not be support by the vendor going forward, thus subjecting the Company to system security risk because system vulnerabilities will not be addressed going forward.

In addition, by moving to the cloud, the Company will no longer need to make extensive capital server investments every 5 years or regular system upgrades every 2 to 3 years.
Project Risks and Mitigation Plan *N/A*
Technical Evaluation / Analysis *N/A*
Project Relationships (if applicable) The project could be delayed if the phase zero or one of the other cloud project such as HCM gets delayed because this could cause some resource constraints.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital			**0**	**0**		**0**
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital					
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor		**$ 236**	**$2,109**	**$130**	
M&S					
Contract Services		**$167**	**$1,498**	**$133**	
Other					
Overheads					
Total		**$403**	**$3,607**	**$233**	

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☒ Strategic	
Project/Program Title: Oracle HCM Cloud Implementation	
Project/Program Manager: Marie Chatterjee/Shailesh Kamath	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☒ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: September 2020	**Estimated Date In Service: December 2023**
A. Total Funding Request ($000) **Capital: $3,354.4 (2022-2024)** **O&M: $0**	**B.** **☒ 5-Year Gross Cost Savings ($000)** **☒ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $0** **Capital: $5,391.2**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:
The HR Payroll system was implemented in 2009 as an on-premise solution and it is the Company's responsibility to maintain and upgrade the system when the version is no longer supported by Oracle, every three to four years. It is also the Company's responsibility to purchase and maintain hardware to house the production and all the test environments. The support provided by Oracle includes security patches, tax update and upgrades to the underlying technology called PeopleTools. Furthermore, there is a complex manual effort to gather and consolidate data to produce basic workforce analytic reports used to make data driven staffing decisions and manage succession planning. These factors increase risk and decrease the efficiency and effectiveness of workforce planning.

The scope of this project includes the replacement of Peoplesoft's Human Capital Management (HCM) and Customer Relationship Manager (CRM) applications (the HR Payroll and myHR Connection systems), the consolidation of disparate Human Resources (HR) systems to a single platform, the development of advanced and predictive workforce analytics and the development of a long-term employee data platform to store 35 years of electronic history and new data from the HCM Cloud.

In 2018, the Company signed a Strategic Partnership with Oracle which includes the subscription fee for the HCM Cloud application. As a result, HR and Information Technology (IT) completed a rapid assessment to determine the level of effort and cost estimates to consolidate and migrate all employee-related business processes to the Oracle HCM Cloud. The assessment included how the Company will reduce compliance risk, support enhanced business practices, increase the efficiency by offering mobile applications, develop advanced workforce analytics, develop a long-term data archive and replace obsolete HR and Learning and Inclusion (L&I) systems. The objectives of the HCM Cloud project are:

- **Improve the Employee Experience**

  The use of technology is the foundation to attract, retain and mange talented employees. As workforce demographics change, the expectations of our employees are changing. The millennial workforce expects their interaction with HR and systems to be intuitive and similar to their consumer experiences. Functionalities must be available on mobile devices and accessible from anywhere, at any time.

  As the workforce is changing, HR must improve the employee experience with the availability of mobile applications. The future HCM Cloud application will include a modern look and feel with new manager and employee self-service features available on mobile devices. Employees will be able to complete their Open Enrollment from any device, from any location and managers no longer need to be logged into a computer to approve time or transactions.

- **Consolidate Disparate HR and L&I Systems**

  The current HR and L&I technical environment is a patchwork of a customized, on-premise Oracle PeopleSoft HCM (HR Payroll) application, 15 homegrown systems and five third-party vendor applications implemented at various times over the past several decades. This additional source of risk and inefficiency is due to the large number of complex system integrations requiring a substantial effort to support and maintain. System consolidation will improve the efficiency and effectiveness and reduce the need for complex data integrations among systems.

  The consolidation of disparate HR systems will improve efficiencies and effectiveness. The need for complex data integrations among systems will be eliminated and reduce the chance of error or system issue. Employees will be able to go to one system to update their goals, see their vacation balance and look up colleagues in the employee directory.

- **Reimagine HR Processes**

  The project scope includes re-imagining all HR related processes to ask why we do things the way we do, is this still required and is this the best way. Leading practices are incorporated into the HCM Cloud application and organizations must adopt these processes as is because there are no customizations to the software. The application remains as delivered and Oracle provides quarterly functionality updates that are reviewed, tested and accept by the customer. Any customizations required must be completed external to the application and connected to HCM Cloud as an extension. All extensions to the software would be the sole responsibility of the Company to maintain and update as needed. With business process re-engineering, customizations will be avoided whenever possible.

- **Advanced and Predictive Workforce Analytics**

  Organizations need workforce analytics to understand their current talent pool, capabilities and competencies that is driven by data. Leaders and managers ideally should be able to compare their business needs to available talent so that future goals can be achieved. Advanced analytics also included in the scope of the project will include workforce predictions such as the possible attrition of high performers, develop what-if scenarios for organizational changes that impact the business and view factors, costs and impact of employee job transfers and reorganizations before they happen. The improved data warehouse will provide skills gap analysis and evaluate demand and supply of specific skills and plan proactively for headcount and attrition.

- **Long Term Storage**

  Currently, the Company has over 35 years of electronic employee data held in different systems, in different formats. This historical data is required to be retained by our data retention policy. Because the data is in different format and is not consistent, it is difficult to use for reporting and analytics. The new Oracle Business Intelligence database will store all the Company's historical data as well as be fully integrated with HCM Cloud as new data is produced.

Given the complexity and new functionality that will be implemented, the Company expects to engage a system integrator, internal resources, and an increase in the number of contractors required to complete the implementation successfully.

For large cloud platform implementations, the project will be complex and time consuming and require technology changes to data integration and security authentication. The replacement of HR Payroll will result in revisions to current integrations with inter-Con Ed Systems such as eBS, Prowatch and various work management systems (Maximo, JTS, CGI Arms, Logica). The future HCM Cloud application will include a modern look and feel with new manager and employee self-service features on mobile devices. With the new mobile functionality, employees will be able to complete their Open Enrollment and view paystubs on any device from any location and managers no longer need to be logged into a computer to approve time or transactions.

The high-level estimate to implement the systems is approximately three years, which is broken down into three phases. This is based on estimates to complete required critical implementation tasks (*e.g.*, conversion, design, build, and testing). The Company currently projects that this project will be completed in 2023.

HCM Cloud Project Overview

The recommendation from the rapid assessment was to divide the scope of work into three major work efforts.

Phase 1 – Migrate PeopleSoft HCM and CRM processes to the Cloud

The first phase of the project will include all major business functions from PeopleSoft HCM and CRM. The project scope is similar to the 2009 HR Payroll Implementation project with the addition of Recruitment, Retiree Self-Service, HR Help Desk and Knowledge Base.

PeopleSoft HCM and CRM Business Functions

Core HR	Benefits Administration	Payroll
Time and Labor	Candidate Gateway	Employee Self-Service
Manager Self-Service	Talent Acquisition	Organizational Changes
HR Help Desk	Retiree Self-Service	Knowledge Base

Phase 2 – Talent Management and Learning

The second phase will focus on consolidating business functions performed in homegrown or third-party vendor applications into single enterprise system.

Talent Management and Learning

PeopleFluent (Management Compensation)	Success Factors (Performance Management)	Employee Photo System
Employee Record System (eRecord)	eWage (Union Compensation)	Organizational Change Database (OCDB)
eTrain/Learning Management System (LMS)*	Manager Approval for Sign	eLearning Publisher
TimeTrack	Tuition Aid (TASS)	TLC Intranet Out of House Training Self-Service
Organizational Change Database (OCDB)	Personnel Car Mileage Reimbursement (PCMR)	Personnel Activity Report
Job Description Library (HRTMS)	Telemetry (Candidate Gateway)	Question Mark

*The learning management system currently includes additional business functions such as tuition aid, contingency planning and conference room reservations which will require additional review to determine if they will be migrated to HCM Cloud.

The HCM Cloud learning module and hosting training content is included in the project cost estimate for this phase and the final approved scope for the HCM Cloud project may impact cost estimates for the Digital Learning Experience project.

Phase 3 - Employee Data Warehouse

The third phase will run in parallel with both phases 1 and 2 to develop a long-term employee data strategy to store 35 years of electronic history and solution for new data from the HCM Cloud. The data warehouse will enable advanced analytics and a sustainable solution for archived data. Included in the scope of this project is the requirement that the Company is compliant with all data retention policies and legal holds.

There are approximately 200 – 300 users and applications that access the existing Employee Data Warehouse (EDW) in production today. Each of these users and applications will need be assessed to determine if the need for employee data is current and appropriate. Once the need for employee data has been validated, a new system integration will need to be established with the new Employee Data Warehouse.

Employee Data Warehouse

Employee Data Warehouse (EDW)	Employee Personal Information Center (EPIC)	

High-Level Timeline

The HCM Cloud implementation is estimated to begin in the first quarter 2020 and currently projected to be completed by 2023. The System Integrator will provide post go-live stabilization support for three months. This is included in the project plan and cost estimate.

Implementation Approach

The rapid assessment included a project approach, staffing estimates, highlights of major "to-be" business processes, consideration of software functionality, and cost estimate to implement the Oracle HCM Cloud solution (HCM Cloud). The scope of the assessment compared the existing HR and Talent Management applications to HCM Cloud. The assessment was performed in August and September 2018.

The implementation will require participation from HR, L&I and IT resources. The project will also require a system integrator to provide specialized technical, functional, and project management experience and capabilities. Effective change management will be required for a high level of adoption to new business processes and procedures.

The implementation will follow an established implementation framework that entails the following approach: Engage, Focus, Refine, Enable, and Operate.

Engage	Focus	Refine	Enable	Operate
Stakeholder Management Manage Education Around the Cloud Conduct Product Familiarization Provide Scope and Estimate Define Business Transition Roadmap Conduct Change Readiness Workshop Draft Plan and Mobilize Project	Project Kick-Off Team Enablement Align Business Process Owners Familiarization and Scope Clarification Create Security, Data Migration, Integration Architecture Generate Cloud Operating Framework Manage Integration Technical Designs	Specify Specific Requirements Configure and/or Build Solution Conduct Process Playback Sessions Confirm and Finalize Solution Undertake Detailed Business Impact Assessment Obtain Final Validation and Sign-off Complete Strategies • Communication • Training • Business and IT Support • Cutover, • Cloud Operating Model	Conduct Training and User Enablement Build Production Solution and Migrate Data Validate Production Solution and Data Execute Transition Drive Cutover to Production Migrate Integrations to Production	Support Go-live Provide Stabilization Support Monitor Adoption Manage Steady State Optimize Business Innovation

Justification Summary:
Migrating to Oracle HCM Cloud will provide new functionality for employees and eliminate the need to maintain and upgrade the Company's on-premise application and hardware. The implementation of the HCM Cloud will result in both tangible (quantitative) and intangible (qualitative) benefits. Listed below are key qualitative benefits the company will experience from implementing the Cloud solution.

Benefit Category	Expected Benefit
Enhanced Data & System Security	• Implementing Oracle HCM Cloud simplifies the system security design, reduces the technology footprint and decreases security risks and vulnerabilities arising from use of non-integrated systems • The HCM Cloud SaaS model could reduce and/or eliminate the need to perform periodic cyber security scans by IT teams and reduce related costs
Improved Agility	• HCM Cloud SaaS model increases the speed-to-provision new services or add additional cloud solutions
Enables use of current technology and digitization	• Implementing HCM Cloud enables faster adoption of new technology and/or processes such as: Social, Mobility, Data Analytics
User Experience	• Oracle HCM Cloud provides a single user experience across mobile, tablet and desktop views • A simplified and intuitive user experience could reduce training costs
Scalability	• The number of subscriptions can be changed easily to accommodate growth or changes in the business • A SaaS model enhances the ability to increase storage capacity as needs change
Operational Excellence	• An automated recruiting process could reduce the overall time to hire • Implementation of HCM Cloud could enhance operational efficiency with fewer helpdesk calls due to a smaller number of applications supported • Performance monitoring could be enhanced since it is included in the service level agreement with the SaaS provider
Increase Standardization Data, Processes and Systems	• Increased ability of authorized business users to query and perform data analytics on human resources, benefits, learning & inclusion, and payroll data without assistance from specialized technical resources. • Reduced IT reliance on limited, specialized technical resources to support many applications built on a variety of technology platforms.
Reduced Compliance Reporting Risks	• Reduced compliance reporting risks due to increased accuracy and completeness of data sourced from an integrated system. • Compiling periodic compliance reports will reduce manual efforts due to greater integration, automation, standardization, and the ability to use pre-built reports and dashboards. • Faster production of key management reports due to fewer integrations and decreased reliance on multiple disparate systems.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
This project will facilitate HR and Talent Management's BCO goals of reducing headcount.

2. Supplemental Information

Alternatives

Alternative 1 - Phased Implementation

Another alternative would be a phased implementation of the HCM Cloud. This alternative would delay a portion of the investment summarized above but would be costlier over the long run and delay the benefits of fully integrated and standardized employee processes and system implemented across the Company.

The key drivers for the decision to pursue a phased implementation are:

- The project team would be able to focus on a smaller scope of work and achieve early successes with HCM Cloud;
- Gain experience with Oracle Cloud environments as administrators and developers with smaller and less complicated business requirements; and
- Gradual change management for the employees and retirees.

The key drivers for the decision not to pursue a phased implementation are:

- This approach would require temporary integrations between PeopleSoft HCM and HCM Cloud so that both systems are in sync for the duration of the project. This integration would not be needed after the full implementation has been completed.
- With each phased go-live, a full regression test would be needed in PeopleSoft HCM to ensure the legacy system was not impacted by the change.
- Any project delays could result in an additional upgrade in PeopleSoft on premise being required in order to remain on Oracle support.

Alternative 2 - Multi-Year Postponement

A third alternative considered was to postpone the HCM Cloud implementation for two or more years. This alternative would delay capital expenditures associated with the implementation, but it would also prolong the Company's ability to address the risks and inefficiencies associated with the current environment and realize the benefits of a recently negotiated agreement with Oracle. The primary reasons for moving forward with the HCM Cloud implementation in the near-term are:

- The Company's PeopleSoft HCM system would continue to be used for several more years, but would require a full application upgrade to implement new functionality, such as mobile pages, with an additional cost of $4.5 million in the short-term.
- A higher number of staff with key homegrown technology skills will potentially retire, increasing both the risk and burden associated with maintaining homegrown systems.

- The overall cost of implementation would not be reduced by postponing the project start-date.

Risk of No Action

One alternative that was considered would be to maintain the status quo and to use and maintain the current, separate systems that support employee and retiree processes. This alternative would expose the company to the following risks:

Risk 1

Highly manual business processes Human Resources and Learning & Inclusion with increased chances for errors and mismanagement (*e.g.*, On-boarding, promotions, transfers, succession planning, learning management).

Risk 2

Existing systems are not fully integrated or user friendly, increasing time required to perform administrative tasks by employees and managers (*e.g.*, performance reviews, timesheet entry and approvals).

Risk 3

Support of homegrown HR systems has significantly reduced over time making the development of new enhancements or the maintenance of compliance related functionality difficult.

Risk 4

Workforce analytics currently employ three different systems, limiting their ability to obtain a single consolidated view of employee data to support effective analysis and decision making.

Non-Financial Benefits

Regulatory Mandated/ Reduce and Manage Risks

Oracle releases quarterly updates to the HCM Cloud for security patches, application updates and tax updates. In the Cloud environment, Oracle will be pushing these changes into the system and IT Support teams will no longer be required to download and apply these patches. Updates will need to be reviewed, tested and accepted by the HR Payroll Support team then applied by Oracle on a quarterly basis. This process of increase the efficiency of applying system updates to always remain in compliance with all required regulations or changes to the law.

Operationally Required

A deferral of this project will have consequences on the existing HR Payroll System. The support and maintenance for PeopleTools will expire in January 2022 and the system will require an upgrade. Without the upgrade, security patches will no longer be available leaving the system vulnerable for a cyber security attack.

Improve Customer Experience

The HCM Cloud platform offers the ability to deliver a modern experience for users via displaying content as tiles and on mobile devices. This will allow for the deployment of the employee and manager self-service transactions to mobile devices. This will enhance self-service to field employees thus reducing call volume in the call center and productive time of the HR Professionals.

Moving employee related business functions to a consolidated platform will provide a single place for employees to manage their personal information and for managers to gain insight into their team.

Enhance External Relationships

Migrating to HCM Cloud will protect the long-term sustainability of the Company's payroll/time keeping process. Oracle's support is now providing updates and patches to cloud applications first before traditional on premise applications such as PeopleSoft illustrating Oracle's support priorities.

Reduce Costs and Strengthen the Company Processes

The HCM Cloud will give field employees the ability to use self-service functionality anywhere at any time. The mobile applications will increase employee productive time as they will no longer need to come into the office, log onto a computer to make simple changes, such as change of address. In addition, the latest software version allows for improved performance with regard to reporting processing time and improved dashboard capabilities, which will allow for more streamlined business processes.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

An analysis of cost savings or avoidance as a direct result of this project was completed and the quantitative benefits are listed as follows:

Totals shown for CECONY and O&R

Cost Avoidance & Credits	
Description	**2022-2031**
Headcount reduction / Operational Efficiencies	$45
Avoid future upgrades, maintenance & patching	$26
Oracle Shelving Credits	$10
Total	**$81**

Cost Reduction	
Description	**2022-2031**
Headcount reduction / Operational efficiencies	$5
Eliminate 3rd party vendors	$2
Total	**$7**

2. Major financial benefits
The majority of the financial benefits is stated above as a cost avoidance. The implementation of this project will enable a transformation of all major employee and retiree business processes which will result in operational efficiencies and headcount reductions.

3. Total cost
Totals shown for CECONY and O&R

Total Project Estimate by Year	2020	2021	2022	2023	Total
Phase 1 – Employee Administration	$3.2	$19.8	$15.2	$1.4	$39.6
Phase 2 – Talent Management			$4.1	$6.9	$11.0
Workforce Data Repository & Analytics	$0.5	$4.9	$4.5	$2.0	$11.9
Total	$3.7	$24.7	$23.8	$10.3	$62.5

4. Basis for estimate
A rapid assessment was completed by Oracle Consulting Services in October 2018 and a business case validation was completed by Accenture Consulting in August 2019. The information provided by the system integrator was used as the basis of the estimate and were further refined by subject matter experts from HR, L&I and IT based on Con Edison's current state and business experience.

5. Conclusion
The industry and HR Payroll technology is shifting towards cloud platforms. Cloud platforms offer more functionality and current technology without the need for financial investments in hardware and internal resources to support an on-premise application. Performing HR Payroll functions is fundamental and operationally required for all companies and a cloud platform will provide the most cost-efficient way to continue providing these required services. In addition, implementing the Oracle solution provides the added incentive of utilizing the Oracle Strategic Partnership and realizing the cloud credits by retiring our on-premise PeopleSoft application.

Project Risks and Mitigation Plan

Risk 1
Delay in the start of the project and the expected go-live date of the new system is postponed.

Mitigation plan
A separate parallel project to complete a PeopleTools upgrade will be mobilized in 2020. PeopleTools is the underlying technology software for PeopleSoft HCM (HR Payroll) and PeopleSoft CRM (myHR Connection). Completing the PeopleTools upgrade will keep the current on-premise PeopleSoft Application compliant and eligible to receive security and tax updates until 2023. This additional time will be a contingency if there are any additional delays with the go-live of phase 1 of the Oracle HCM Cloud project.

Risk 2 Mitigation plan

Technical Evaluation / Analysis

A. Infrastructure Support

No additional hardware purchase is required for HCM in the Cloud but a system administrator would be needed to monitor the status and system utilizations.

B. System Compatibility

N/A

C. Customization/Development

Cloud based applications cannot be modified directly. Any system customizations or modifications must be created using Platform as a Service (PaaS) to extend the cloud application. There is an additional subscription fee associated with creating a PaaS environment and all maintenance and testing of the extensions are the responsibility of the company. Oracle will not provide any support of PaaS development.

The HCM Cloud implementation project will prioritize business process re-engineering as the first option whenever possible. Compliance or union contract related requirements will be considered for a system customization if no other solution can be identified.

Currently the HR systems have over 200 integrations with other company systems or external vendors that will be in scope for this project. In many cases, custom development may be required to create the data in the format requested.

D. Project Schedule/Timeline Risks

Currently HR/Payroll on-premise system uses Peoplesoft tools version 8.57 which would be supported by Oracle through January of 2022 for critical patches and tax updates. To avoid another high-priced PeopleTools upgrade the Phase 1 of Oracle HCM cloud implementation to transition from on-premise Peoplesoft HR/Payroll modules to Oracle cloud would have to be completed by January of 2022.

Project Relationships (if applicable)

- Work Management Systems
  - Maximo
  - Logica
  - JTS
  - GOPs
  - MWM
  - WMS (O&R)
- Oracle eBS (Financials)
  - General Ledger
  - Cost Accounting
  - Employee Data
  - Accounts Payable
- Benefits Vendors (i.e. CIGNA, MetLife)
- Payroll Vendors (i.e. ADP, BNY Mellon)
- Workforce Vendors (i.e. Equifax, ProWatch)
- Recruitment (i.e. Medgate, Sterling)
  - OHAS/Sick time processing

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital						283
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	Request 2022	Request 2023	Request 2024	Request 2025
Capital	2,036.8	1,822.4	1,532.0		
O&M*					

Capital Request by Elements of Expense:

EOE	2021	2022	2023	2024	2025
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total	2,036.8	1,822.4	1,532.0		

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings			46		
O&M Avoidance				46	46
Capital Savings					
Capital Avoidance				485	185

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program