Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - Upgrade Applications to SQL Server 2008
Work Plan Category	Operational - Critical Repair
Project Manager	O'Donoghue
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

This project is part of an ongoing business systems sustainability initiative necessitated by the end of Microsoft's Extended Support for SQL Server 2000 in April 2013. SQL Server 2000 is a database platform widely used in Con Edison business systems. Without this support coverage, we would be required to pay incremental costs for security updates for all SQL Server 2000 databases. These security updates are an important part of our overall corporate network security plan.

All SQL Server 2000 installations must be moved to the SQL Server 2008 database platform to avoid these costs and continue Microsoft's Extended Support coverage. The scope of work included in this project is to identify, test and remediate all business applications to ensure their sustainability on the new SQL Server 2008 database platform.

In order to meet the April 2013 deadline for Microsoft Extended Support coverage, we planned a two-pronged approach to the remediation work, implementing both short term and long term application solutions.

During 2012 we implemented permanent solutions to a number of applications using SQL Server 2000; however, where more complex efforts were required, we developed temporary solutions to either work around or shield complex programs from the new database environment. These short term solutions were implemented to allow applications to run in the SQL Server 2008 platform and meet the April 2013 support deadline. Short term options include the use of conversion tools to build wrappers around older programs, called Data Transformation Service (DTS) packages. The long term approach would be to remove these wrappers and completely rewrite these programs in the newer SQL Server Integration Services (SSIS) technology supported by Microsoft. This would enable us to support changes to business logic contained in these programs moving forward.

In 2013, we will continue addressing the remaining business applications, and begin to replace the temporary remediation work with permanent technology solutions in 3Q 2013 to ensure compliance with all current database standards. We will also start to review business applications on the SQL Server 2005 database platform to prepare for a similar migration effort to SQL Server 2008 by July 2015.

Justification:

After April 2013, Microsoft will no longer provide security updates for SQL Server 2000. Rather than exposing corporate data and assets to security

breaches, we would incur incremental support costs to have Microsoft develop security updates for this unsupported technology. In addition, remediating business applications to use SQL Server 2008 will sustain or improve our levels of performance, scalability, security, and continue Microsoft's Extended Support through January 8, 2019. Features provided by SQL 2008 will enable performance and security improvements as well as allow applications to take advantage of the new features available with the SQL 2008 and beyond platform.

***** Alternatives: None. The only viable option to reduce the risk of system downtime without incurring additional maintenance costs from Microsoft is to be proactive in migrating to the new supported technology platform.

***** Risk of No Action: The risk of no action may result in:

- Higher incremental support costs from Microsoft. The current extended support agreement from Microsoft calls for substantial increases to secure unsupported technologies, such as SQL Server 2000, beginning at $200K annually and doubling that amount each subsequent year.
- Reduced availability and security for critical business applications.
- Key applications remain on an unsupported technology

***** Non Financial Benefit Explanation: The effort to remediate systems will improve our levels of performance, scalability, security, and monitoring. More importantly, the remediation of business applications will allow for the migration to SQL Server 2008, which is covered under Microsoft's Extended Support through January 2019, sustaining our ability to implement timely security updates.

***** Technical Evaluation and Analysis: Analysis is done for each application to determine the most cost effective approach to replace or remediate the system. Both short term and long term plans were made to meet our deadlines.

* Project Relationships: Business Systems Sustainability – Upgrade Applications to Windows 7.

Current Status: Ongoing

Funding: ($000s)

Funding Cost	2013	2014	2015	2016	2017	2018	2019	Total

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$569

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$920	$901	$463	$729	$875	$3,888

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						$569
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$569

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$920	$901	$463	$729	$875
Indirects					
Contingency					
Total	$920	$901	$463	$729	$875

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - Upgrade Applications to Windows 7
Work Plan Category	Operational - Critical Repair
Project Manager	Maggie O'Donoghue
Project Status	In Progress
Service Date	Dec 31, 2017

Work Description:

This project is part of an ongoing business systems sustainability initiative necessitated by the end of Microsoft's support for the Windows XP operating system in April 2014. The scope of work included in this project is to identify, test, and remediate all applications to ensure continued sustainability on the new Windows 7 platform.

The first phase of the project focused on the analysis of how the planned Windows 7 deployment will impact specific systems. Remediation plans have included both temporary and permanent system solutions.

Wherever possible, permanent solutions were implemented to upgrade all components of our systems to corporate standards and vendor supported technologies compliant with the Windows 7 platform. However, where more complex efforts were required, we developed temporary solutions to either work around or shield complex programs from the new Windows 7 environment. These short term solutions are deployed to ensure that applications will function as expected on the Windows 7 platform as plans are developed for more long term and sustainable solutions at a subsequent date. Short term options include modifying the application to execute in Windows 7 with the aid of a tool such as Terminal Server, deploying virtualization tools to assist in executing the application or making small modifications to the application to enable them for the Windows 7 platform. The long term approach requires the redevelopment of some corporate applications to use the Visual Studio development environment and necessitates upgrades to the Visual Basic.Net (VB.Net) platform in order for these applications to execute and be maintained on the Windows 7 operating system.

Justification:

This effort will allow the Company to meet the Windows 7 deployment date of April 2014 and avoid the costs required to purchase Microsoft's Extended Support for Windows XP. In addition, remediating business applications to fully utilize the Windows 7 platform will ensure our applications remain functional and can be easily maintained or enhanced as needed in the future. Features provided by Windows 7 will enable performance and security improvements as well as allow applications to take advantage of the new features available with the Windows 7 platform.

* Alternatives:

None. In order to deploy Windows 7, the only viable option is to ensure business applications continue to perform as expected and to implement a

plan to migrate the applications to a fully supported technology platform.

***** Risk of No Action: The risk of no action may result in:

- Higher incremental support costs from Microsoft. The current extended support agreement from Microsoft calls for substantial increases to secure unsupported technologies, beginning at $200K annually and doubling the amount each subsequent year.
- Reduced availability of critical business applications.
- Key applications remain on an unsupported technology
- Inability to deploy the Windows 7 operating system because business applications are not compatible.

* Non Financial Benefit Explanation: Upgrading applications to the new technology platform will produce applications that are developed according to the same standards, which will ease the knowledge transfer between developers, and result in a more streamlined maintenance of corporate systems.

***** Technical Evaluation and Analysis: Each application is thoroughly analyzed and tested to determine the best approach to ensure compliance and maintainability with the Windows 7 operating environment.

* Project Relationships: Business Systems Sustainability – Upgrade Applications to SQL Server 2008

Current Status: In progress

Funding ($000):

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$569

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$920	$901	$463	$729	$950	$3,963

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						$569
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$569

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$920	$901	$463	$729	$950
Indirects					
Contingency					
Total	$920	$901	$463	$729	$950

Capital – Shared Services - Information Resources

Project Name	CCTN Expansion - Mobile WiMAX Access Network
Work Plan Category	Oper - Critical Repair
Project Manager	Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Con Edison owns and operates a private communications network called Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communications circuits for SCADANet, voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier cost savings.

CCTN also provides multiple radio systems to support voice to field crews and machine to machine smart grid applications. We own multiple frequency ranges that are used in these radio systems and technology to overcome last mile and coverage problems to deliver these critical applications is necessary. WiMAX, 802.11 and LTE wireless technology have demonstrated the promise to deliver high performance while not requiring line of sight. Projects include:

In 2012, a new backend radio console technology was evaluated and piloted in a control center to allow multiple carrier and private radio systems to converge in a single desk set.

In 2013, this technology will be deployed to remaining control centers. Additionally, LTE, 802.11AC and WiMAX will be evaluated at various locations to complement wireless networks which will replace S/N. And a review of licensed capacity to replace the unlicensed wireless local loops.

Justification:

Deployment of a high-speed mobile data network on the proven standard based radio frequency (RF) technology platforms like LTE or WiMax provides the potential to diversify redundant local loops to every facility that is currently served by two or more backhaul circuits.

Typically, wired access networks, either fiber or copper are affected by the same emergencies that cause severe damage to the public underground infrastructure such as major operational events or other events such as contractor damages, water main breaks, etc.

A high speed wireless data infrastructure can provide diverse backhaul connections to facilities affected by such incidents over the air as opposed to under the ground.

While unlicensed wireless communications are in service at targeted sites to provide wireless local loop access, a more effective and reliable wireless infrastructure requires the use of licensed spectrum to overcome

the potential interference risks and transmit power limitations of unlicensed spectrum.

To this end, several efforts are underway to make broadband spectrum available and to pilot a system on equipment that can be initially deployed on unlicensed spectrum and be easily reconfigured to operate on licensed spectrum.

Once a high speed data network is built with mobile capability, it can also be used to provide voice services via VoIP technology, eventually replacing the voice radio infrastructure with a single wireless access network that can provide voice, video and data as it is built out in greater density while leveraging the CCTN fiber core and the existing IP expertise on staff.

This project identified in this white paper addresses departmental and Corporate risks associated with:

- Failure of critical business application
- Critical radio system infrastructure
- Failure of critical business application
- Safety
- Physical damage of corporate server farm

*	Alternatives:	The alternative to WiMax or LTE is to continue to operate using expensive fiber construction, existing narrowband private frequencies or carrier services wherever required.
*	Risk of No Action:	Risks include limited communication to assets not directly on company property, limiting data acquisition and control applications. The Company's 800 MHZ radio system will be obsolete in 4-5 years. Without an RF strategy the Company would become dependent on carriers for all field communications and smart grid applications.
*	Non Financial Benefit Explanation:	The proposed projects and use of CCTN at Con Edison offer the following other benefits: • Ability to provide carrier diversity to critical communication circuits • Offers the highest level of cyber and physical security • Provide a higher reliability level to carrier circuits • Scale capacity over time through card replacements • Improved recovery time from communications failures • Ability to provide services outside of the Telco carriers • Ability to provide voice, video & data services on a single wireless infrastructure
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, carriers, vendors and Company employees ensure the selection of the optimal solutions.
*	Project Relationships:	IT projects, completed or future require and expect sufficient performance of the network.

Current Status: Technology viability being investigated and piloted

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$459

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$402	$1,031	$805	$805	$240	$3,283

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						$459
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$459

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$402	$1,031	$805	$805	$240
Indirects					
Contingency					
Total	$402	$1,031	$805	$805	$240

Capital – Shared Services - Information Resources

Project Name	CCTN Expansion - Fiber Projects
Work Plan Category	Oper - Critical Repair
Project Manager	Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Con Edison owns and operates a private communications network called the Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communications circuits for SCADANet, voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier cost savings. There are over 100 Company locations which host the equipment used by CCTN. Since the late 1980s, over 400 miles of fiber optic cable has been implemented to provide CCTN communications services. In most cases, these fiber runs were done in an efficient fashion by combining them with electric distribution cable installations. As business requirements and interference requirements are addressed, expansion capacity increases and replacement of fiber paths are required each year. Additionally, alternate technologies to compliment and improve efficiencies within the network are planned for the next 5 years.

In 2013, the new fiber spans planned include:

• Add a new fiber route between Sedgwick Avenue and McLean Avenue to create an alternate path from Westchester. This will provide an alternate path from Westchester to Manhattan and Queens. This is critical especially for future server farms planned for the northern part of the service territory.

• Add a new fiber run from Flatbush Ave to the Third Ave Yard to replace one of the oldest and most heavily spliced cables in the network. This path is also critical for connectivity into Staten Island.

• Continue the redesign of the fiber run from College Point to Astoria. This is also one of the oldest and problematic spans in the network. The current plan is to replace sections where performance has been problematic instead of a single costly replacement of the entire span.

• Add new fiber runs between Dunwoodie and Sprainbrook, Sprainbrook and Eastview, Eastview and Pleasantville, Pleasantville and Millwood, and Millwood and Buchanan. These fibers are currently run on towers, installed more than 15 years ago, and are experiencing degradation due to exposure to the elements.

In subsequent years, the fiber spans to be upgraded include:

- Add a new fiber run between 4 Irving Place and the Murray Hill Substation. This span is one of the main fiber routes between 4 Irving Place and the Energy Control Center (ECC).
- Add a new fiber run between the Murray Hill Substation and West End

Avenue to continue upgrading of this critical yet old fiber span.
- Add a new fiber span between East River and the new Gold Street Communications Hut. This fiber is heavily used, old, and does not have sufficient fiber capacity for our ongoing needs.

Justification:

CCTN will continue to provide the Company with a high-speed, reliable and cost effective alternative and compliment to public carriers. Communications requirements for data, voice, protection, SCADA and video circuits will result in the installation and deployment of modern communication technologies to many Company facilities. CCTN provides the network for SCADA, protection and data services to critical substations necessitating capital projects to improve diversity and capacity to those locations. CCTN has far surpassed the use of public carriers for communications and provides a corporate backbone for all communication services for the foreseeable future. Many major CCTN nodes possess diverse Points of Entry (POE) and redundant components including power sources to eliminate any single point of failure and provide redundancy and diversity. Substations are interconnected to the core CCTN network with fiber runs to support high speed services. Wireless technology is considered for redundancy and diversity when installing new fiber is not feasible or justified.

This project identified in this white paper address departmental and Corporate risks associated with:

• Failure of critical business application
• Failure of the Email System
• Infrastructure constraints
• Safety
• Critical radio system infrastructure
• Physical damage of corporate server farm

* Alternatives: The alternative to CCTN is to procure all communications from carrier services. This approach is not recommended due to failure rates associated with carrier circuits and the lead time associated with repair and new service delivery. IR has developed a new approach to maintain fiber by proactively identifying small sections which are prone to failure and replacing them in advance. This eliminates costly projects to replace the entire span.

* Risk of No Action: Risks include loss of service resulting from other infrastructure providers disrupting Con Edison fiber and impacting service. Other risks include the inability to fix fiber failures without a full replacement because of deterioration over time

* Non Financial Benefit Explanation: The proposed projects and use of CCTN at Con Edison offer the following other benefits:

• Ability to provide carrier diversity to critical communication circuits
• Offers the highest level of cyber and physical security
• Provide a higher reliability level than carrier circuits

- Scale capacity over time through card replacements
- Improved recovery time from communications failures
- Ability to provide services outside of the Telco carriers
- Avoid construction delays and costs needed for carrier services

* Technical Evaluation and Analysis: Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, carriers, vendors and Company employees ensure the selection of the optimal solutions

* Project Relationships: IT projects, completed or future require and expect sufficient performance of the network.

Current Status: In Progress; since 2007, 12 fiber spans have been repaired

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$549	$1,382

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$1,357	$1,583	$1,327	$393	$750	$5,410

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-	$145	$350
M&S	-	-	-	-		
A/P					$306	$762
Indirects					$98	$270
Contingency						
Total	$0	$0	$0	$0	$549	$1,382

EOE	2013	2014	2015	2016	2017
Labor	$350	$400	$350	$100	$200
M&S	-	-	-	-	-
A/P*	$707	$833	$677	$206	$375
Indirects	$300	$350	$300	$87	$175
Contingency					
Total	$1,357	$1,583	$1,327	$393	$750

Capital – Shared Services - Information Resources

Project Name	CCTN Facilities Improvements
Work Plan Category	Oper - Critical Repair
Project Manager	Terrence Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Con Edison owns and operates a private communications network called Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communications circuits for voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier cost. There are over 100 Company locations which host the equipment used by CCTN. These locations, referred to as CCTN nodes, are equipped with AC & DC backup power systems, cabling, heating, ventilation and cooling systems, single point grounding systems and security access system and provide for a redundant and diverse design for the network. This program performs upgrades on these facilities for 4-10 locations per year. The work includes:

1. Replacement of HVAC system
2. Cable modernization
3. UPS & DC Power system upgrade commensurate with the criticality of the location
4. Grounding remediation
5. Swipe Card Access Upgrade

The following work was completed through 2012:

- HVAC systems were upgraded at 4 communications facilities locations: Hudson River East, Buchanan Service Center, North Castle 1 and Arthur Kill penthouse.
- 11,000 feet of fiber cable has been replaced.
- 10 DC/UPS/battery systems were replaced at the following communications facilities: 4IP-Rm.415; WEA-Rm.277 & 278; 750E 16 St; 4IP-MSO; 4IP-MECC; RyeHQ-Rm.312; 4IP-Rm.723; BUC-hut; Cheesecoate-hut.
- Grounding remediation was completed at Buchanan Service Center, Tottenville and College Point Blvd.
- Swipe Cards were migrated from the legacy access system to the corporate system at 35 communications facilities/rooms.

The following work is planned for 2013:

- HVAC system upgrades at 4 more communications facilities: ESB-Rm.8101, Flatbush Ave-Rm.407B and 2 others to be determined.
- Fiber span replacements at West End Ave to E74 St to Rainy,

Hudson Ave Gen to East River.

- 10 DC/UPS/battery systems to be replaced at the following communications facilities: Greenwood; Gowanus, Todt Hill; Montefiore; 4IP-Rm.211; 4IP-Gen.Rm; College Point Blvd;1 Davis Ave; Mott Haven, TLC-3NE.
- 2 grounding remediation at sites to be determined.
- Swipe Cards to be migrated from the legacy access system to the corporate system at 8 more communications facilities/rooms.

Justification:

CCTN will continue to provide the Company with a high-speed, reliable and cost effective alternative and compliment to public carriers. Communications requirements for data, voice, protection, SCADA and video circuits will result in the installation and deployment of modern communication technologies to many Company facilities. CCTN will provide protection and data services to all critical substations necessitating capital projects to improve diversity and capacity to those locations. CCTN has far surpassed the use of public carriers for communications and provides a corporate backbone for all communication services for the foreseeable future. Many major CCTN nodes possess diverse Points of Entry (POE) and redundant components including power sources to eliminate any single point of failure and provide redundancy and diversity. Substations are interconnected to the core CCTN network with fiber runs to support high speed services. Wireless technology is considered when fiber is not feasible or justified.

The swipe card upgrade provides a single room access management system eliminating the cost of duplicating a system for telecom rooms.

The following statistics have been generated which corroborate the reduction in service improvements based on the project upgrades:

Year	Trouble Tickets Reported
2006	162
2007	213
2008	105
2009	89
2010	31
2011	55
2012	20 (to 3/31/12)

* Alternatives: The alternative to CCTN is to procure all communications from carrier services. This approach is not recommended due to failure rates associated with carrier circuits and the lead time associated with repair and new service delivery

* Risk of No Action: Risks include increased communications failures associated with HVAC, cabling and power loss. The resultant failures would need to be repaired on an emergency basis, increasing costs of procuring equipment, OT of employees and the loss of service while the repair is completed

*	Non Financial Benefit Explanation:	The proposed projects and use of CCTN at Con Edison offer the following other benefits: • Ability to provide carrier diversity to critical communication circuits • Offers the highest level of cyber and physical security • Provide a higher reliability level to carrier circuits • Scale capacity over time through card replacements • Improved recovery time from communications failures • Ability to provide services outside of the Telco carriers
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, carriers, vendors and Company employees ensure the selection of the optimal solutions
*	Project Relationships:	IT projects, completed or future require and expect sufficient performance of the network.

Current Status: The following has been accomplished.

Activity	Completed Units
1. HVAC systems	4 Locations (HRE,BUCSC,NC1,AK)
2. Cable replaced (fiber)	11,000 Feet
3. UPS/DC Power Systems	58 Rectifiers/Battery Stacks/UPS units
4. Grounding Remediations	3 Jobs (BUCSC,TOTT,CPT)
5. Swipe Card	35 Locations upgraded to corp

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$612	$561

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$532	$532	$532	$532	$532	$2,660

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-	$145	$130
M&S	-	-	-	-		
A/P					$367	$321
Indirects					$100	$110
Contingency						
Total	$0	$0	$0	$0	$612	$561

EOE	2013	2014	2015	2016	2017
Labor	$125	$125	$125	$125	$125
M&S	-	-	-	-	-
A/P*	$302	$302	$302	$302	$302
Indirects	$105	$105	$105	$105	$105
Contingency					
Total	$532	$532	$532	$532	$532

Capital – Shared Services - Information Resources

Project Name	CCTN Modernization - Mapping System
Work Plan Category	Oper - Critical Repair
Project Manager	Terrence Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2013

Work Description:

Con Edison owns and operates a private communications network called the Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communications circuits for voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier cost savings. There are over 100 Company locations which host the equipment used by CCTN. These locations, referred to as CCTN nodes, are equipped with communications equipment that deliver communications circuits using standard protocols called SONET and DWDM. In addition to the electronic equipment, over 400 miles of fiber optic cable has been implemented to provide CCTN communications services. The outside plant OSP (fiber optic cable) and inside plant (ISP) consisting of SONET, DWDM, Channel Banks, and other telecommunications equipment, require a sophisticated mapping system to not only track the fiber routes and equipment, but also to permit instantaneous viewing of what circuits traverse what fiber optic cables and equipment. The current complexity of the CCTN network has expanded beyond the capabilities of the current static spreadsheet and Circuit Layout Record (CLR) formats which are maintained by a staff augmentee. A more sophisticated dynamic platform is now required to map all the components of the CCTN network as we continue to expand this important communications backbone for the company and depend less on manual record keeping. This map based graphical information systems (GIS) software will provide for the day-to-day design, planning, troubleshooting, and response and repair of the many elements of the CCTN network including SONET, DWDM, Ethernet, OSP/ISP Fiber, Copper, CAT5 and COAX network infrastructures.

In 2012, the mapping solution was selected via a requirements analysis and RFP process and installation of the product was completed.

In 2013, the asset information will be will be entered into the new system, staff instructed on its operation and the system will be put into production.

Justification:

We are planning to convert our CCTN network inventory, provision, and capacity management to a fully-featured packaged software solution that will enhance the information flow by reporting data in a geographical view. This map based GIS software will also enable us to integrate and correlate data such as OSP/ISP Fiber Cables, Network Equipment, Network Facilities, and Circuit Layout Records and ultimately lessen our dependence on a contractor to manually do this work. The system will be available on the corporate network to authorized users and will allow staff to quickly determine fiber routes to assist with repairing breaks or

designing new paths improving recovery time.

The system will enable the elimination of a contractor who is currently responsible for maintaining paper records and producing reports as needed.

This project identified in this white paper addresses departmental and Corporate risks associated with:

• Failure of critical business application
• Failure of the Email System
• Critical radio system infrastructure
• Physical damage of corporate server farm

*	Alternatives:	The alternative to this mapping system is to continue using the manual input and static Circuit Layout Records (CLRs) to track an expanding CCTN network. This approach is not recommended due to the increasing complexity of the CCTN network and need to rapidly repair, design, and determine complex communications circuit routings.
*	Risk of No Action:	Risks include the inability to accurately track and maintain the CCTN network on an automated and standardized basis; the increased time required to locate fiber breaks in the field; the productivity lost manually looking for circuit documentation; the potential of losing manual data gathered over the years; and incomplete issuance of change management documentation when all circuits on a particular fiber cannot be determined quickly
*	Non Financial Benefit Explanation:	The proposed Mapping project of CCTN will offer the following other benefits: • Provide a dynamic map view of the entire CCTN network's elements • Generate circuit layout records automatically • Indicate with greater precision fiber break locations • Improve recovery times from communication failures • Provide scalability to handle system expansion and replace other static mapping or diagrammatic systems used by Information Technology Planning (ITP) • Provide a dynamic tool for system design and testing
*	Technical Evaluation and Analysis:	Information Resources has reviewed and analyzed mapping system software packages offered by seven vendors. Each vendor was individually evaluated for their ability to meet set criteria set forth by Communications Planning. Multiple criteria were established in order to rank the strengths and weaknesses of each platform and develop a technical ranking matrix that will enable selection of the ultimate system that will be used.
*	Project Relationships:	None

Current Status: Product evaluations and selection

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$506

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$195					$195

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						$506
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$506

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$195				
Indirects					
Contingency					
Total	$195	$0	$0	$0	$0

Capital – Shared Services - Information Resources

Project Name	CCTN Modernization - SONET Conversion
Work Plan Category	Oper - Critical Repair
Project Manager	Terrence Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Con Edison owns and operates a private communications network called Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communications circuits for SCADANet, voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier costs. There are over 100 Company locations which host the equipment used by CCTN. These locations, referred to as CCTN nodes, are equipped with communications equipment which deliver communications circuits using standard protocols called SONET & DWDM. Information Resources has established Cisco as a new provider for this equipment replacing Lucent which supplied this equipment since CCTN's inception during the late 1980s. The Lucent equipment is no longer supported by Lucent and is maintained by 3rd party contracts and accumulated spare parts. This multi-year project provides a plan to provide the new standard and move critical circuits to the new standard. The conversion process started when the Cisco solution was selected. Through 2012, 55% of the Lucent equipment has been replaced.
In 2013, we will continue to replace and migrate circuits from the legacy Lucent system to the newer Cisco equipment. We will also be increasing bandwidth availability where required using the DWDM capabilities of the Cisco equipment.

Justification:

CCTN continues to provide the Company with a high-speed, reliable and cost effective alternative and compliment to public carriers. Communications requirements for data, voice, protection, SCADA and video circuits will result in the installation and deployment of modern communication technologies to many Company facilities. CCTN will provide protection and data services to all critical substations necessitating capital projects to improve diversity and capacity to those locations. CCTN has far surpassed the use of public carriers for reliable communications and provides a corporate backbone for all communication services for the foreseeable future.

The Lucent equipment is end of life and limits us with capacity and bandwidth options. The Cisco solution provides the ability to maximize the value of existing fiber through multiplexing, increased capacity, added redundancy and implement the latest networking protocols.

This project identified in this white paper addresses departmental and Corporate risks associated with:

- Failure of critical business application
- Failure of the Email System

- Critical radio system infrastructure
- Safety
- Physical damage of corporate server farm
- Critical IT projects

*	Alternatives:	The alternative to CCTN is to maintain the current environment with the unsupported technology. We have acquired ample spares and have procured maintenance with 3rd party providers. This approach is not recommended due to failure rates associated with the devices and the inability to scale for new capacity requirements.
*	Risk of No Action:	Risks include increased communications failures associated with the unsupported and aging Lucent platform. The resultant failures would need to be repaired with limited options and potential for difficulty in obtaining replacement parts. Fiber optic lasers, used to transmit data via light, have limited life expectancies. Their failure rate is expected to increase over time resulting in more frequent maintenance and eventually the scarcity of replacement parts.
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, carriers, vendors and Company employees ensure the selection of the optimal solutions. The Cisco solution was established after a technology evaluation of Lucent, Nortel and Cisco.
*	Project Relationships:	IT projects for all line of business, completed or future, require and expect sufficient performance of the network.

Current Status: In Progress; 55% of Lucent circuits have been converted to date

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$261	$338

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$168	$338	$196	$196	$196	$1,094

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P					$261	$338
Indirects						
Contingency						
Total	$0	$0	$0	$0	$261	$338

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$168	$338	$196	$196	$196
Indirects					
Contingency					
Total	$168	$338	$196	$196	$196

Capital – Shared Services - Information Resources

Project Name	Computer and Communications Accounting System
Work Plan Category	Strat - System and Component Upgrades
Project Managers	Anthony Giardina
Project Status	In-Flight Project
Service Date	Dec 31 2017

Work Description:

The Telephone Equipment Management System (TEMS) is the primary source of all telecommunication, computer and software cost allocations based on inventory and usage. Through several completed and planned enhancements, this will become a key part of an improved inventory, verification and cost control process for CECONY and O&R. TEMS was enhanced in 2011 and 2012 to adapt to the Oracle Enterprise Business Suite (EBS), the company's new financial system. TEMS is used to track the inventory of CECONY telecommunication lines, and manage costs and billing for telecommunication service contracts.

We plan on developing a system to facilitate the TEMS accrual and amortization processes to improve accuracy and productivity. In addition, we plan on developing systems to better allocate infrastructure costs.

Telecom Central is an intranet web application that manages the workflow of service requests for CECONY and O&R for all wireless and landline telecommunication devices including cell phones, Blackberrys, pagers, IP phones, radios, air cards and ancillary features and services. Telecom Central is also the centralized repository to manage the inventory of Orange and Rockland wireless devices. Telecom Central provides wireless device inventory data to TEMS for cost allocation to O&R accounts. Telecom Central was modified in 2011 and 2012 to adapt to the new EBS accounting structure through TEMS.

Telecom Central will be enhanced to improve the process for maintaining landline inventory for O&R. Reports will be developed to manage billing and inventory exceptions for CECONY and O&R. This new functionality is key in maintaining accurate inventories for cost control and allocation to the proper sections.

The Computer Cost Central (CCC) system provides a comprehensive repository of computer hardware and software inventory. CCC also provides computer and software use information to TEMS for hardware maintenance and software licenses cost allocation to organizations based on the inventory and usage information. CCC was modified in 2011 and 2012 to adapt to the new EBS accounting structure for computer budget reports.

A moderate mitigation effort is underway through extension of CCC software control capabilities to help mitigate the corporate risk associated with software license compliance. Enhancements planned include expansion of the methods for tracking and controlling software licenses including virtualized software and other license bases. The enhancements

will allow users to monitor software usage, facilitate the re-assignment of un-used computers and software licenses avoiding unnecessary procurement. Additional report enhancements are planned to provide additional tools to better manage department costs related to computer and software use.

Justification:

The objective of the TEMS, Telecom Central and Computer Cost Central applications is to provide Company operations personnel and management with better insight across operational groups and systems, specifically in the areas of IT and Telecommunication assets and costs.

*	Alternatives:	Maintain inventory in off line databases (Excel, Access, etc.). This is not a recommended solution as it does not provide the built in security and research capabilities that the TEMS, Telecom Central and Computer Cost Central systems currently offer.
*	Risk of No Action:	Loss of productivity and lack of timely, accurate and quality information necessary to allocate expenses to operational users • Lack of timely, quality information for operational users and management for use in making technical and or business decisions. • Lack of information lineage (i.e. traceability of information)
*	Non Financial Benefit Explanation:	Accurate inventories will provide information related to technical end of life and maintenance and disposal requirements
*	Technical Evaluation and Analysis:	As enhancements are identified, each is analyzed for productivity, cost and schedule impact and prioritized accordingly
*	Project Relationships:	Project One. TEMS, Telecom Central and Computer Cost Central have all been successfully modified to interface to Oracle EBS and adapt to the new accounting structure.

Current Status: In-Flight

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$339	$129	$113

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$113	$113	$113	$113	$113	$565

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P				$339	$129	$113
Indirects						
Contingency						
Total	$0	$0	$0	$339	$129	$113

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$113	$113	$113	$113	$113
Indirects					
Contingency					
Total	$113	$113	$113	$113	$113

Capital – Shared Services - Information Resources

Project Name	Cybersecurity - Info Resources
Work Plan Category	Oper - Critical Repair
Project Manager	Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Evaluate and implement technology to reduce the risk of unauthorized access to Con Edison resources and enhance our cybersecurity posture through the use of awareness and technical solutions. Continue focus on protecting critical operating cyber assets in conjunction with operating areas. In 2012 the following projects were completed:

- Evaluation and implementation of a Mobile Device Management (MDM) solution for personal devices
- Evaluation and implementation of a new Intrusion Prevention System (IPS) at the perimeter
- Evaluation and implementation of a new IPS system at 4 Irving Place server farm
- Increased the capacity of the Security Event Manager (SEM)

The following projects are planned to improve the security level in 2013:

- Deploy new IPS systems at server farms in SV, Rye and Grasslands
- Evaluate and implement new scanning tool to identify vulnerabilities
- Evaluate and implement multifactor authentication for remote access
- Evaluate and implement SDAU replacement
- Evaluate and implement MD5 hash checker

Justification:

Cyber Security has been identified as one of the top corporate risks and must be incorporated in every aspect of the energy delivery business. While many steps have been taken to design and implement a security perimeter to defend Company resources, new risks are identified each day and new techniques are needed to stay secure and improve that defense. Attack vectors change and responses to them must be swift and definitive. Failure to maintain a proactive stance will create an unacceptable risk for the corporation. The risks include operating failures of control systems, damage to transmission and distribution assets, damage to the company's name, the loss of sensitive data and even rising to the safety of employees and the public.

Cyber security risks today are evolving into Advanced Persistent Threats

(APT) which are unlikely to be detected using dated technology.

Energy delivery businesses today are required to document and report on cyber security programs to regulators and both NYS and the Federal government, and to comply with mandated requirements.

Security projects identified in this white paper address departmental and Corporate risks associated with:

- Cyber attack
- Rogue Employee
- Unauthorized access or loss of sensitive data
- Unsupported technology in computer systems

*	Alternatives:	The alternative to investing in additional cybersecurity technology is to maintain the existing environment and limit accessibility from the Company to external resources and restrict access to Company resources from the outsiders. This would also affect the access to critical operating data by engineers who would be restricted from the data.
*	Risk of No Action:	Failure to maintain a proactive stance will create an significant risk for the corporation. The risks include the loss of business systems, operating failures of control systems, damage to transmission and distribution assets, damage to the company's name, the loss of sensitive data and even rising to the safety of employees and the public
*	Non Financial Benefit Explanation:	The proposed projects will provide the following benefits: • Improved perimeter defense and monitoring using behavioral network technology • Improved processes for server and application security administration • Improved controls on access of critical systems and information • Improved accessibility and availability for users • Improved reporting and analysis capability through real-time dashboards
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, vendors and Company employees ensure the selection of the optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout.
*	Project Relationships:	Smart Grid projects require detailed level cyber security plans commensurate with best practices
	Current Status:	Firewall standards established in 2009; IDS systems updated in 2012; Two Factor authentication and remote access design updated in 2011

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$1,463

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$991	$629	$512	$620	$900	$3,652

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		$150
M&S	-	-	-	-		$1,183
A/P						
Indirects						$130
Contingency						
Total	$0	$0	$0	$0	$0	$1,463

EOE	2013	2014	2015	2016	2017
Labor	$150	$150	$150	$150	$150
M&S	-	-	-	-	-
A/P*	$711	$349	$232	$340	$620
Indirects	$130	$130	$130	$130	$130
Contingency					
Total	$991	$629	$512	$620	$900

Capital – Shared Services - Information Resources

Project Name	Desktop Infrastructure
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Terry Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Introduce and maintain a standard desktop set of tools which incorporate the latest technology to improve productivity, efficiency and collaboration while providing ease of use and access. The standard operating system (OS) is the cornerstone to the business systems and data we use at Con Edison. Currently Windows XP is scheduled to be obsolete in 2014. Windows 7 testing and deployment planning is currently underway. The project will additionally streamline the delivery and maintenance of third party tools such as Office, Visio and Project and client server business applications from any computer through the use of virtualization. A library of virtual applications will be available for immediate downloads from any PC internally or externally through a virtual desktop. User content (home directories and MY Documents) including search engine will be available from anywhere to notify users of what content they own and to easily find what they need. Plan includes the deployment of Microsoft Windows 7 and Office 2010.

The project includes the following goals in 2013:

• Application virtualization conversion for Windows 7
• Application access through Virtual Desktop (VDDI) or Terminal services
• Microsoft Enterprise Desktop Virtualization (MEDV) technology to allow virtual desktop images for locked down environments and restricted resources
• Deployment of Windows 7 to 75% of the Company PCs
• Deployment of Office 2010 to 75% of the Company PCs
• Implement folder redirection to allow access to “My Documents” from any PC
• Software auditing control through central software streaming

Justification:

Provides the latest productivity and collaborative desktop tools for employees to perform business functions in a secure fashion. Enables secure desktop environment to share information with external partners as well as provide collaborative sites for internal files sharing and team activities. Make all 3rd party applications and business applications available without being resident on every device and efficiently manage license use. Improve operational processes by enabling a single version of software to be maintained and streamed to users as needed. Potentially reducing requirements to patch 14,000 PCs and disrupt the operation in doing so. Enable employees to work anywhere from any device. Provides the capability to display and search user content to avoid recreating work and preventing versioning inefficiencies.

Desktop Infrastructure projects identified in this white paper address departmental and Corporate risks associated with:

- Cyber attack
- Significant IT projects
- Failure of critical business application
- Unsupported Technology in Computer Systems
- Unauthorized Access or Loss of Sensitive data

Beginning in 2014 and through the use of virtualized machines and software savings resulting from delaying new computer purchases and/or purchasing thin client savings of $850k per year will be realized reducing XM10 computer equipment budget item.

*	Alternatives:	The alternative is to remain on the current desktop environment with limited options for software deployment. By 2014, in order to maintain security, Windows 7 will be needed on desktops and laptops.
*	Risk of No Action:	The risk includes allowing current environment to become unsupportable introducing performance and reliability problems as well as certain cyber security risks. As other industries adopt newer technologies Con Edison's ability to interact and collaborate will become a challenge. Business system rollouts will become problematic without investing in the proper test and lab tools.
*	Non Financial Benefit Explanation:	Provides the latest productivity and collaborative tools for employees to perform business functions in a secure fashion. Enables secure desktop environment to share information with external partners as well as provide collaborative sites for internal files sharing and team activities. Make all 3rd party applications and business applications available without downloading to each device and efficiently manage license use. Improve operational processes by enabling a single version of software to be maintained and streamed to users as needed. In certain cases, this avoids a requirement to patch 15,000 PCs and disrupt the operation in doing so. Provides the capability to display and search user content to avoid recreating work and preventing versioning problems.
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, vendors and Company employees ensure the selection of the optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout
*	Project Relationships:	Current and future business applications require desktop software to be up to date and supportable. Company policies require the computing environment to adhere to cyber security policy

Current Status:

Program continues to build on the foundation. Power Plant application rolled out using virtual software

Windows 7 testing completed for all applications – remediation in progress

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$1,503	$1,000

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$782	$1,567	$1,371	$782	$782	$5,284

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P					$1,503	$1,000
Indirects						
Contingency						
Total	$0	$0	$0	$0	$1,503	$1,000

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$782	$1,567	$1,371	$782	$782
Indirects					
Contingency					
Total	$782	$1,567	$1,371	$782	$782

Capital – Shared Services - Information Resources

Project Name	ICON Radio Wireless System
Work Plan Category	Oper - Critical Repair
Project Manager	Terrence Walsh
Project Status	In-Flight Project
Service Date	Dec 31 2013

Work Description:

Con Edison owns and operates a private communications network called Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communication circuits for SCADANet, voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier cost savings.

CCTN also provides multiple radio systems to support voice to field crews and machine to machine smart grid applications. These private radio systems include one 800 MHZ used for voice communications between control centers and field personnel and is called iCON. In addition we have multiple applications which support the distribution automation running on 900MHZ frequencies. These systems share an infrastructure of antenna sites throughout the service territory which enable communication to occur. This is similar in concept to a carrier cell towers and the cell phone. Projects have been established to maintain the radio networks and equip the antenna sites with the facilities and components needed to reliably operate.

The following work was completed through 2012:

• Establishment of a Mount Vernon Site:A new iCON omni-directional radio site was started to provide reliable coverage and improved quality of service for voice communications in Mount Vernon and surrounding areas. Such benefits have already been realized on the DAS radio system from its radio equipment at Mount Vernon.

• New iCON radio replacements Portables: 599 deployed through 2012 (mainly to Gas re Floral Park), 963 in stock.
• Design for a new radio tower at Rye Service Center: Zoning field surveys, simulations and tower design completed; site engineering and permitting in progress in 2012.
• Consolidation of equipment at the Empire State Building: Engineering and drawings completed; legacy UHF equipment removed, upgraded and relocated; vendor pre-qualification started; statement of work (SOW) completed for competitive bid process.

The following work is planned for 2013:

• Mount Vernon: Complete site engineering design & drawings and compact outdoor iDEN cabinet design; upgrade AC power and install

antenna systems.
• New iCON radio replacements - Portables: Deploy 300 more r765s.
• Radio tower at Rye Service Center: Complete site design and procure hut.
• Consolidation of Empire State Building: Remove microwave equipment and dishes; Upgrade & relocate Lucent with Cisco SONET equipment; complete Engineering and drawings and DoB permitting; begin room reconstruction.
• Implementation of additional Microwave BackHaul Links to improve diversity for radio backhaul:

Justification:

Project associated with the replacement of iCON portable radios is intended to modernize the inventory and replace the radios which are from the original radio system purchase in 2002 and at end of life. Newer form factor improves usability. The cost of repairing the radios has increased over the years and the cumulative costs will soon approach that of a new portable for the majority of the radios, having already exceeded it for those that are used in the most demanding operating environments.

Motorola has developed a new portable, the r765, that will provide the added capabilities and performance described below. Moreover, the r765 will replace the i1000, i550 and r750 models.

A program to replace the 2500 portable radios is proposed to provide reliable communications, improved voice quality and to avoid the increasing costs associated with maintaining the aging population. Also, a single portable will vastly simplify the maintenance and support processes.

Project associated with consolidation of the equipment in the Empire State Building will allow the lease charges to drop resulting in a savings of $200K per year beginning in 2013.

Project associated with the replacement of United Hospital with iCON tower at Rye Service Center. The existing residence building located at United Hospital is facing eminent demolition, as the hospital is closed, and the property has been sold.

Relocation of the iCON/DAS radio site to a permanent secure facility providing equal or improved coverage is imperative. A comprehensive study was commissioned to identify possible sites within an acceptable radius; Rye Service Center (Con Edison site) met all conditions, and exceeded expectations. Additionally, a Geotech analysis site survey has proven the property is within all norms for tower construction.

The scope of work includes, Construction of a 180’ tower, installation of local power, direct connection to CCTN at Rye, relocation of a fully operational shelter including the back-up generator to the site
Other benefits include:

• Improve communications reliability and availability
• Expand radio coverage of the iCON system
• Maintain workforce productivity and safety

• Improve voice quality
• Avoid increasing repair costs
• Simplify maintenance & support

*	Alternatives:	Increased costs for repairs as equipment ages, difficulty in acquiring parts and service once the new radio is more widely deployed and adopted by other users. Concerns exist that manufacturers will not supply new devices or parts if utility investment is not maintained. There are no alternative manufacturers (Motorola) of iDEN equipment. Dismantle the company private radio system and incur costs for carrier communications to supplement iCON communication resulting in limited diversity for critical communications.
*	Risk of No Action:	Failure to improve radio system performance in the area will result in lower productivity of work crews and unnecessary delays in the area because of the inconvenience of using multiple communications devices. Increased costs for repairs as equipment ages, difficulty in acquiring parts and service once the new radio is more widely deployed and adopted by other users. Potential delays in reporting emergencies or injuries and other safety issues if communications fail Diminishing manufacturer's support as more resources are invested in alternative communications.
*	Non Financial Benefit Explanation:	iCON functionality including the advanced emergency communication button and Talk Groups would not be available on carrier based communications devices. Based on Con Edison input during the development phase, the manufacturer has provided the r765 radio that is better suited to our work
*	Technical Evaluation and Analysis:	Information Resources performs radio frequency (RF) analysis before performing any re-design of the radio systems. This includes propagation studies and reviews by 3rd party experts. Additionally, lease contracts are negotiated aggressively and clauses include lease reductions for the retirement of any equipment. Radios and antennas are thoroughly tested prior to purchase to ensure they will work in our environment.
*	Project Relationships:	Floral Park incident response requires replacement of GAS radios for field employees
Current Status:		Projects status – Mount Vernon: Delayed due to Smart Grid priority. iCON Portables: 425 deployed in 2011 (mainly to Gas re Floral Park), 475

in stock for 2012.
Radio tower at Rye Service Center: Engineering and Permitting in progress in 2011-2012.
Consolidation of Empire State Building in progress
Implementation of Microwave BackHaul Links: Investigating dual band equipment and are awaiting spectrum information

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$1,618	$640	$1,342

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$394					$394

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	$39	$86	$100
M&S	-	-	-	-		
A/P				$1,399	$444	$1,082
Indirects				$170	$110	$160
Contingency						
Total	$0	$0	$0	$1,608	$640	$1,342

EOE	2013	2014	2015	2016	2017
Labor	$25	-	-	-	-
M&S	-	-	-	-	-
A/P*	$319				
Indirects	$50				
Contingency					
Total	$394	$0	$0	$0	$0

Capital – Shared Services - Information Resources

Project Name	New Technology
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Terry Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

Introduce new technology to provide solutions for business requirements and improvements in productivity, efficiency, cost savings, performance and security. Information Resources technical staff interfaces with business areas and investigates trends and solutions in the IT arena for use at Con Edison. Each year new products and solutions are selected, researched with industry experts and vendors before being evaluated, piloted and implemented in the Con Edison environment. Product selections are done in conjunction with IR strategy drivers and vision statement and in many cases are selected for installation in the subsequent year.

In 2012, multiple new tablets were evaluated and piloted – these include iPADS, Samsung Galaxy's, and Samsung Android devices. Pilots were initiated and software for accessing internal resources was introduced

In 2013, device activity will continue with Windows 8 Surface tablet. Also the following technologies are on the evaluation horizon:

- SAN monitoring tool
- Central computer power management
- Voip monitoring tool
- VM management tool
- Digital Signage

Justification:

Technology changes at a rapid clip in today's business world. In order to stay competitive and operate in an efficient manner new technology must be evaluated and implemented into the enterprise to solve business problems and maintain improvements in productivity. Planned projects for 2012-13 include:
• Central computer power management
• VMware Management tool
• Application access via smart phone
• Real-time video streaming from field devices
• Network performance tool for managing VoIP and QOS

New Technology projects identified in this white paper address departmental and Corporate risks associated with:

• Cyber attack
• Rogue Employee
• Unauthorized access or loss of sensitive data
• Unsupported technology in computer systems

*	Alternatives:	The alternative is to remain at current levels and wait until the business processes begin to erode or fail to the point that a quick and less analytical technical decision is implemented. This would reduce the likelihood that the best selection will be made and will seamlessly operate in the environment or is sustainable going forward.
*	Risk of No Action:	The risk includes allowing current environment to become unsupportable and insecure by not introducing upgrades where necessary or when functionality becomes mainstream. Opportunities for cost savings are lost. Internal systems operate with less functionality or fail to interoperate with outside or new business systems delaying investments and benefits identified with other technology projects. As other industries adopt newer technologies Con Edison's ability to interact and collaborate will become a challenge. Business system rollouts may become problematic without investing in the proper test and lab tools
*	Non Financial Benefit Explanation:	Financial savings are dependent on the technology, in many cases resulting in employee productivity and the ability to implement business technology when required. The ability to provide real-time video streaming to a central server enables immediate access to SMEs and senior management. Problems can be addressed before they become emergencies or unnecessary work is prevented. The ability to provide reliable and state of the art voice communications to employees in the office and field.
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, vendors and Company employees ensure the selection of the optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout
*	Project Relationships:	Current and future business applications require infrastructure platforms to be available and supportable to ensure reliability, security and accessibility

Current Status:

Program continues to build on the foundation and plans exist for the next 5 years. Send Word Now and wireless guest network implemented in 2010, Blackberry Tethering and Citrix Application Gateway introduced in 2011. In 2012, multiple tablets and slates were piloted and introduced to selected business areas.

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$1,212	$500

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$859	$502	$502	$502	$750	$3,115

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-	$264	$110
M&S	-	-	-	-		
A/P					$752	$300
Indirects					$196	$90
Contingency						
Total	$0	$0	$0	$0	$1,212	$500

EOE	2013	2014	2015	2016	2017
Labor	$175	$110	$110	$110	$150
M&S	-	-	-	-	-
A/P*	$534	$302	$302	$302	$470
Indirects	$150	$90	$90	$90	$130
Contingency					
Total	$859	$502	$502	$502	$750

Capital – Shared Services - Information Resources

Project Name	SCADANet
Work Plan Category	Oper - Critical Repair
Project Manager	Terry Walsh
Project Status	Ongoing Program
Service Date	Dec 31 2017

Work Description:

The increased use of microprocessors in the energy delivery environment has greatly increased the ability to collect important operating data and improve automation and control of assets from control centers. A new, physically diverse SCADANet operations communications network has been commissioned and is currently running multiple applications. The network provides access from control centers to energy assets in substations and in the field for Electric, Gas and Steam. The network was designed and implemented using TCP/IP. A private high-speed core network links control centers and, using a combination of Company owned private communication circuits and carrier services, provides the means to run multiple SCADA applications across a single infrastructure. Substations and other locations will have multiple connections to the core. Public networks and carrier links enter the network at 3 core locations which have additional layers of security. The project utilizes existing fiber assets from the Company's private network and utilizes wireless where requirements dictate.

The following goals were completed in 2012:

- Added 2 core nodes at TLC and 30 Flatbush
- Connected 14 phasor measurement unit (PMU) sites to SCADANet
- Added capacity and diversity network increases in Staten Island to support VDAS

Projects planned for 2013 include:

- New SCADANet installations for backup Gas and Electric Control Centers in Victory Blvd, Eastview and Bruckner Blvd.
- Implementation of Network Operations Center (NOC) Monitoring Tools for network and security
- Support the deployment of (3) new applications
    - Dynamic Feeder Rating
    - Disturbance Monitoring
    - Leak Detection System
- Install Silver Springs Network device configuration and monitoring system

Justification:

The electric industry is undergoing a radical change in the use of technology. Field components now come equipped with microprocessors and the capability to collect power quality and load data. On the other

hand, FERC and NERC are enforcing new cyber and physical security regulations that affect the ability to achieve the benefits from this new technology. Con Edison is currently designing and piloting multiple new SCADA and Smart Grid applications. In addition, during the 2012 year, the PSC expressed concern for protecting customer information including meter reads. SCADANet is designed to provide secure communications and address these concerns. Infrastructure has been built to support the following initiatives:

- Smart Meters and advanced metering infrastructure (AMI)
- Home Area networks for demand management
- Sectionalized Switching
- Secondary Model validation
- Transformer Monitoring
- Distributed Generation control

This project identified in this white paper address departmental and Corporate risks associated with:

- Failure of critical business application
- Critical radio system infrastructure
- Unauthorized access or loss of sensitive data
- Significant IR projects
- Rogue employee
- Safety

* Alternatives:

Alternative networks for providing Smart Grid solutions will require extended use of the Internet and other public networks. This will increase security and reliability risks associated with using public networks. A carrier based network will also increase costs associated with providing scalability, redundancy and diversity. Installation and support costs increase due to duplication of network components

* Risk of No Action:

Without a strategic plan for providing for smart grid communications the risks include the inability to effectively implement new smart grid technologies due to security, reliability or regulatory requirements. The proliferation of multiple unsupportable and unreliable networks may cripple critical applications

* Non Financial Benefit Explanation:

The proposed network will include designs to allow Smart Grid initiatives:

- High speed network with redundancy and diversity
- Leverage existing investment in Company private network
- Grow as needed without large network expenditures
- Operate securely and within regulatory guidelines
- Provide a private wireless solution to enable last mile connectivity with incremental costs with only incremental costs for field devices
- Establish security layers for public network (Internet and carrier) interconnections

* Technical Evaluation and Analysis:

Information Resources has designed and implemented a robust wide area network for the computing environment. Much of the infrastructure needed to build this network is present through the Corporate Communications Transmission Network (CCTN). Building on the design and technology which is used to support the information network created support and monitoring synergies as well as provided the optimal

performance and central cyber security program required for grid and SCADA applications

* Project Relationships: Multiple SCADA and stimulus smart grid projects require SCADANet communications to successfully implement according to cyber security plans and performance objectives

Current Status: Entering the third of a multi-year project to grow SCADA and Smart Grid communications according to business requirements

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$2,000	$1,464	$1,652

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$1,815	$1,466	$1,240	$1,692	$750	$6,963

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	$74	$89	$360
M&S	-	-	-	-		
A/P				$1,721	$1,199	$877
Indirects				$205	$176	$415
Contingency						
Total	$0	$0	$0	$2,000	$1,464	$1,652

EOE	2013	2014	2015	2016	2017
Labor	$350	$300	$225	$325	$125
M&S	-	-	-	-	-
A/P*	$1,165	$906	$815	$1,087	$515
Indirects	$300	$260	$200	$280	$110
Contingency					
Total	$1,815	$1,466	$1,240	$1,692	$750

Capital – Shared Services - Information Resources

Project Name	Server Farm Infrastructure - Worth St
Work Plan Category	Oper - Critical Repair
Project Manager	Terry Walsh
Project Status	In-Flight Project
Service Date	Dec 31 2016

Work Description:

Design and build a highly efficient, centralized and dedicated facility in unused space at the Worth Street Service Center to support server and mainframe applications displaced due to restacking efforts within 4IP required to comply with Local Law 26. The scalable design would also meet the demand for future growth in server and storage applications and accommodate the retirement of other less efficient server rooms thus reducing the Company's IT carbon footprint.

In 2012, IR will complete the design and engineering for the construction at the Worth St site.

In 2013, construction will begin with the installation of the concrete pad and infrastructure purchases including generator, UPS, modular frame and all piping cabling and network equipment.

The construction is scheduled to be completed in mid 2014.

Justification:

Information Resources (IR) department recommends the construction of a new server farm at the Company facility located at 30 Worth St in Yonkers at a total cost of $19,070,000. The server farm is a modular design and will be installed on a concrete pad near the parking lot on an area that is currently unused. The plan calls for construction to begin in 2013 and be completed in 2014.

The Company's restacking plan for 4 Irving Place has been accelerated in order to comply with Local Law 26. As each floor is renovated per the restacking plan, affected IT infrastructure is displaced and must be relocated elsewhere in order to maintain operations. Such infrastructure includes existing data centers on 4 and 17. Facilities Management and IR have established a plan to eliminate these data centers and relocate the essential equipment to the proposed new server farm at 30 Worth St. The existing data center on the 4th floor houses the Company's mainframe environment which runs critical business systems including the customer system and billing. Additionally, there are over 500 distributed servers running in the two data centers. The restacking plan includes the renovation these two locations and conversion to traditional office space.

The Worth St server farm plan also provides for the Company's expanding server and storage needs by establishing a scalable architecture would also meet the demand for future growth in server and storage applications and accommodate the retirement of other less efficient server rooms thus

reducing the Company's IT carbon footprint. The amount of electronic data has grown 10 fold over the past 5 years and the number of server images grows by 12% each year. This project addresses corporate and departmental risks associated with:

- Failure of critical business application
- Significant IT Projects
- Failure of the Email System
- Infrastructure constraints
- Physical damage of corporate server farm

*	Alternatives:	Keep the 4th and 17th floor data centers in operation to support the Company's mainframe environment and existing server and storage environment and provide compliance with Local Law 26 with the equipment in place. This would require maintaining the two data centers with the inefficient HVAC and power infrastructure going forward.
*	Risk of No Action:	The mainframe environment could continue to operate at 4 Irving Place with increasing costs to maintain the HVAC and power facilities. Action would be required to condition the locations to comply with Local Law 26 with equipment in place.
*	Non Financial Benefit Explanation:	Server and storage applications enable critical business functions for the Company including financial systems, customer systems and control systems. Servers also provide access to Company data in the form of email, files and maps. The ability to access these systems and resources is critical to the Company. The amount of electronic data has grown 10 fold over the past 5 years. This project will provide the Company with Tier IV reliability for these resources for the next 10 years. Worth St will also present opportunities to deploy systems faster and access resources faster and more reliably than today.
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis, based on Tier IV design considerations, security and flood maps before a location is selected. Projected server and storage growth are all factored in the design and selection. The modular and scalable design of the Worth Street Data Center is expected to support future changes in technologies and computing resource requirements
*	Project Relationships:	Irving Place Re-Stacking (Local Law 26) requires the relocation of multiple server rooms supported by dedicated business units and the data centers DC1 and DC2.

Current Status: Information Resources has submitted an ESR including conceptual designs for plot and floor plans to Facilities Engineering. Facilities Engineering has issued a contract to a Consulting Engineering firm to assist with the design and engineering work, which is currently scheduled for year end 2012. The construction will commence in 2013.

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$1,470

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$11,850	$5,750				$17,600

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						$1,470
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$1,470

EOE	2013	2014	2015	2016	2017
Labor	$500	$300			
M&S	-	-			
A/P*	$10,500	$4,850			
Indirects	$850	$600			
Contingency					
Total	$11,850	$5,750	$0	$0	$0

Capital – Shared Services - Information Resources

Project Name	Server Farm Infrastructure
Work Plan Category	Oper - System Capacity
Project Manager	Terrence Walsh
Project Status	Not Started
Service Date	Dec 31 2017

Work Description:

Information Resources plans to meet the Company's expanding server and storage needs while at the same time implement a disaster recovery strategy by constructing server farms strategically located throughout the CECONY and O&R service territory creating a diverse and redundant architecture. Server farms have already been constructed and are operational at Grasslands Substation, Rye Service Center, 30 Flatbush Avenue, 4 Irving Place, Spring Valley (SVOC) and the Learning Center. Two new Server Farms are currently under construction at Van Nest Campus and at 4 Irving Place.
In addition to the installation of supporting infrastructure at the new server farms, significant enhancement of existing infrastructure at facilities currently housing the other existing server farms will be required. Components and systems such as server cabinets, UPS's, environmental and equipment monitoring, and power distribution wiring, are among some of the enhancements that will be required. Storage area network (SAN) infrastructure and additional computer storage.

In 2013, plans call for:

- Upgrades to the SAN technology at SVOC and 4 Irving Place
- Additional storage for the mainframe environment to allow a new test environment and a third copy of online data. This will allow application testing without outages

In subsequent years the following items are scheduled:

• Upgrade and replacement of aging, inefficient and obsolete electrical infrastructure, including installation and replacement of switchgear, circuit breakers, electrical panels, wiring and UPS's at 30 Flatbush.

• Connection to an existing unused diesel generator and switchgear that will provide emergency backup power to critical network infrastructure supporting a server farm, that will ensure continuous operation in the event of a loss of normal power at 30 Flatbush.

• Modifications to existing structures, including installation of enclosed structure to house computing equipment and ancillary support equipment, provisions to prevent outside water penetration, and other architectural room refurbishments as required at all locations.

• Enhancements that will repurpose several existing server farms to accommodate more efficient technologies and necessary data storage capacity at 30 Flatbush.

Justification:

In order to meet server and storage equipment deployment requirements necessitated by the new applications and resource requirements of business units throughout the company, Information Resources has embarked on a program for accommodating these needs by building and expanding server farms. The server farms are a combination of new facilities and upgrades to existing server locations and are being designed and constructed to meet our current design standards, to optimize efficiency and incorporate green technology. The objective of the server farm program is to meet current and future needs so as to maintain high server availability and facilitate disaster recovery and business continuity. The criteria of diversity, minimal construction costs and future synergies are also key elements in establishing the design basis of the server farms. The congregation of servers, especially new technology blade servers, in any location requires significant enhancements to existing facilities to meet the high electrical power and cooling requirements noted above.

The project identified in this white paper addresses departmental and Corporate risks associated with:

- Failure of a growing portfolio of critical business application
- Failure of the Email System
- Infrastructure constraints
- Physical damage of corporate server farm

* Alternatives:

The alternative is to decentralize the IT infrastructure and allow hosting and deployment of hardware in unsecure areas lacking the proper HVAC and power systems needed for reliable business systems. Upgrading numerous existing facilities with the infrastructure necessary for reasonable reliability, does not take advantage of economies of scale and poses significant supportability problems.

* Risk of No Action:

The risk includes the inability to successfully implement new corporate initiatives such as Project One and Work Management. Server Farm capacity problems are already impacting the Company's ability to upgrade many servers to a supportable version. New technology rollouts will be delayed or cancelled due to an inability to implement them in a suitable production environment

* Non Financial Benefit Explanation:

Con Edison has implemented redundancy and diversity for the 2400 servers currently supporting business applications and computer resources. These applications enable critical business functions for the company including financial systems, customer systems and control systems. Servers also provide access to company data in the form of email, files and maps. The ability to access these systems and resources is critical to the continuity of the Company. The amount of electronic data has grown 10 fold over the past 5 years. Server farms have been constructed and implemented in Grasslands, Rye Service Center and most recently in Spring Valley. This program will provide the Company with server farm Tier IV reliability for these resources for the next 10 years.

* Technical Evaluation and Analysis:

Information Resources performs planning and analysis on new server farm installations. Tier IV design considerations are used and before a location is selected a review of security, flood plains and projected server growth

are all factored in the design and selection. IR's plan includes the construction of the Worth St server farm which will be scalable and provide resources for the next 10 years.

* Project Relationships: Current and future business applications require infrastructure platforms to be available and supportable to ensure reliability, security and accessibility. The Project One and Work Management Company initiatives require significant resources to be successfully implemented and the current server farm capacity is not capable of supplying that capacity.

Current Status: Construction of a new server farm at Van Nest in the Bronx is on schedule for completion in 2012 and planned for production operation Quarter 3 of 2012. Also in 2012, the design and engineering work will be started for a new server farm at Worth St. in Yonkers

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$1,144	$1,310	$519		$1,200	$4,173

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*	$1,100	$1,250	$500		$1,150
Indirects	$44	$60	$19		$50
Contingency					
Total	$1,144	$1,310	$519	$0	$1,200

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - COBOL Modernization and Upgrade
Work Plan Category	Strat - System and Component Upgrades
Project Manager	O'Donoghue
Project Status	Not Started
Service Date	Dec 31 2017

Work Description:

The company is required to make improvements to maintain a viable and effective Customer Service System. The company's Customer Service System (CSS) is composed of a suite of applications that provide for the support of the customer service and billing functions. COBOL (Common Business Oriented Language) is a high-level programming language that has been the primary business application language for Con Edison mainframe applications for over 30 years, and is still utilized today as the primary business programming language for CSS applications.

The following is a list of the COBOL products installed and utilized at CECONY:

• OS/VS COBOL – Version 2.4 is our installed version of OS/VS COBOL and the default compiler option LANGLVL(1) implements the 68 COBOL Standard. OS/VS COBOL consists of compiler and library components, and we utilize a compiler optimizer.

• VS COBOL II - The predominant version of VS COBOL II at CECONY is Version 1.3.0. VS COBOL II consists of compiler and run-time library components. The default compiler option CMPR2 implements the 74 Standard with a mix of certain 85 Standard features. The NOCMPR2 compiler option can be used to generate 85 Standard code.

• COBOL for OS/390 – This newer version of IBM COBOL is a compiler only and requires the use of the Language Environment. The installed version is 2.1.2 and the installation default compiler option NOCMPR2 implements the 85 Standard.

• Enterprise COBOL – The latest IBM supported version of COBOL. Enables the integration of business critical COBOL applications with modern web technology. z/OS Language Environment provides the execution environment and library of COBOL runtime services required to compile and run COBOL applications using Enterprise COBOL.

IBM no longer supports the earlier versions of COBOL. Support for OS/VS COBOL was dropped in 1994 and support for VS COBOL II was dropped in 1996. And in 2005, IBM dropped support for COBOL for OS/390. The current version of COBOL available from IBM is Enterprise COBOL which implements only the 85 COBOL Standard. This implies that there will be

source code migration issues in converting from OS/VS COBOL and VS COBOL II.
Unless Con Edison undertakes a migration effort to upgrade all unsupported COBOL environment to the Language Environment and the new compilers for applications such as CSS, RAIS, TCIS, Output Billing RVS, the Company will not be able to upgrade to new versions of other strategic IBM mainframe products in future releases and could impact the ability to compile enhancements and modifications to existing programs and affect the entire CSS and billing services

Justification:

Unless Con Edison undertakes an effective and dedicated migration effort to upgrade the COBOL environment to the Language Environment and the new compilers, the Company will not be able to upgrade to future versions of other strategic IBM mainframe products. Eventually, currently installed versions of these software products will not be supported by the vendor. This will inhibit new upgrades of the z/OS operating system and could introduce error conditions on the mainframe systems which could crash customer service online applications and batch programs. A significant amount of resources would be required to resolve errors immediately and develop temporary fixes to the legacy applications if possible. Employee productivity as well as customer service and billing support services would be severely impacted. Along with IBM products, new versions of critical third party application software products (i.e. BSI, Finalist) that require the use of the Language Environment and the new COBOL compilers will also be inhibited by unsupported versions of the IBM mainframe products which could result in penalties from the US Postal Service for incompliance of required features.

* Alternatives:

Although IBM has dropped support for OS/VS COBOL and VS COBOL II, through the years Con Edison has been able to use these products without major problems in our environment, and they have remained compatible with recent versions of the mainframe operating system (z/OS), as well as the major IBM subsystems and database management systems CICS, DB2, and IMS.
However, recent IBM product announcements indicate that this situation will change with new versions of strategic IBM software products

* Risk of No Action:

Legacy COBOL technologies in use, unsupported by IBM, no longer operates under a newer version of the IBM mainframe operating system (z/OS) or CICS, DB2, IMS subsystems, would result in an adverse impact on the Company's Customer Service Systems.

* Non Financial Benefit Explanation:

• XML support Enterprise COBOL provides new statements for parsing and generating XML documents. These statements allow programs to transform XML content into COBOL data structures and COBOL data structures into XML documents.

• Java interoperation Enterprise COBOL includes object-oriented COBOL syntax that enables COBOL to interoperate with Java. This Java interoperation is also supported under IMS.

• Support to run in multiple threads Enterprise COBOL has a toleration level of support for POSIX threads and signals. With Enterprise COBOL, an application can contain COBOL programs running on multiple threads within

a process.

• Support for Unicode

• Improved DB2 function Enterprise COBOL includes support for DB2 stored procedures and support for the DB2 coprocessor.

• Improved CICS function Enterprise COBOL includes CALL statement support, for faster CICS performance than when using EXEC CICS LINK, and eliminates the need for BLL cells.

• COBOL language improvements Ability to perform math and financial functions in COBOL, using Intrinsic Functions. You can replace current routines written in FORTRAN or C with native COBOL code, thus simplifying your application logic.

• Above-the-line support Virtual Storage Constraint Relief (VSCR) allows programs to reside, compile, and access programs below or above the 16-MB line.

***** Technical Evaluation and Analysis:

The migration effort will require coordination between Application Services and the business areas for testing and validation. The major steps in the migration will be:

• Inventory the status of our application programs in order to determine their source languages, compiler versions, and compiler options.

• Replace old COBOL run-time libraries with the Language Environment in the production environment. This will require testing to verify that the old COBOL programs are compatible with the Language Environment. In order to migrate to the Language Environment, we will also have to replace PL/I run-time libraries in the production environment. We have already discovered some compatibility issues with our PL/I programs and the Language Environment under IMS.

• Convert COBOL 68 and 74 Standard source code to 85 Standard source code and validate.
• Utilize Enterprise COBOL as the standard COBOL compiler.

Software tools such as the IBM Problem Determination Tools can be utilized to assist in the inventory of application programs and to convert COBOL source code. Consulting services could also be obtained to plan or conduct the migration effort as required.

***** Project Relationships:

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$450	$232	$365	$365	$1,412

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$450	$232	$365	$365
Indirects					
Contingency					
Total	$0	$450	$232	$365	$365

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - IBM Script Mitigation to HP Exstream
Work Plan Category	Strat - System and Component Upgrades
Project Manager	O'Donoghue
Project Status	Not Started
Service Date	Dec 31 2016

Work Description:

IBM SCRIPT/VS is a text formatting language developed at IBM in the late 1970s. SCRIPT/VS uses inline commands to format text for AFP (Advanced Function Print) to configure physical formatting of text on a mainframe printable document. Con Edison currently utilizes IBM SCRIPT for the format of over 300 credit letters, meter reading access notices, etc.

This effort will convert the approximate 350 credit letters and 50 meter access notices from IBM SCRIPT to HP Exstream, a modern enterprise document composition software product and the standard product for the Company.

This upgrade would enable us to bring these documents up to the level of the Exstream-produced billing document, and enable duplex printing, 2D bar coding and USPS IMB bar coding. We will be able to combine mailings to achieve the best USPS volume discounts.

Justification:

Loss of Productivity / Loss of Support Risks: The availability of programmers and systems specialists trained in IBM SCRIPT/VS has diminished. Without an upgrade to the more flexible and modern document management software product HP Exstream, future enhancements of existing or new letter requirements will be increasingly difficult to support and maintain. This will result in the inability of Customer Service letters to be effectively developed or modified, and will include a substantial loss of productivity and resources in the ineffective maintenance of these legacy letters. In addition, the IBM SCRIPT/VS is an unsupported IBM software product which puts the Company at risk with the continued viability and support of the Company's ability to bill and serve its customers. HP Exstream, however, is a fully supported product, and IR specialists are trained to support this platform for the long term.

Business Continuity Considerations: IBM AFP (Advanced Function Printing) print files produced by Exstream carry the AFP components that allow them to be printed on any AFP printer without pre-loading fonts and other resources, thereby simplifying disaster recovery exercises. This portability is a strategic feature that influenced the decision to purchase Exstream for the conversion of the CECONY bill. Additionally, Exstream provides printer independence. Exstream generates most all print and electronic formats needed, including AFP, Metacode, Postscript, PCL,

PDF, XML and RTF, without ever having to change the original design. Developers can move applications across platforms and be 100% assured of the same functionality, throughput and document fidelity.

*	Alternatives:	No action – the current legacy letters utilizing IBM SCRIPT/VS can continue to operate in their current state without remediation. The documents will run, however the risk exists that a change request from Customer Operations or a future mainframe database upgrade or changes in technologies, could cause them to fail or become unstable.
*	Risk of No Action:	Should the IBM SCRIPT/VS documents not be converted to HP Exstream, the risk exists that a change request from Customer Operation or a future mainframe database upgrade, or changes in mainframe technologies, could cause the documents to fail or become unstable. This would compel IR to support a critical situation that would require immediate attention and, based on the timeframe to remediate some systems, can cause functionality impacts to customer notifications from the Company affecting the Company's ability to appropriately serve its customers.
*	Non Financial Benefit Explanation:	• Process improvements by consolidation of many print streams • Elimination of CBILL-specific paper stock and envelopes simplifies inventory management • Software enables fast conversion to, or addition of, other types of outputs such as PDF, XML and e-mail • Application development is done on a Windows platform using a Word-like interface versus manually editing a dataset on the mainframe. • Produces documents on both mainframe and Windows platforms
*	Technical Evaluation and Analysis:	HP Exstream is the standard enterprise document composition software product for the Company
*	Project Relationships:	

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$225	$116	$182		$523

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$225	$116	$182	
Indirects					
Contingency					
Total	$0	$225	$116	$182	$0

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - NetMap and Maps Website Replacement and Consolidation
Work Plan Category	Strat - System and Component Upgrades
Project Manager	O'Donoghue
Project Status	Not Started
Service Date	Dec 31 2017

Work Description:

Two map visualization applications that would benefit from rewrite and consolidation are the NetMap platform and the Maps website. The NetMap platform consists of 29 sub-applications and has 2,135 registered users. Netmap is a framework within which several different intranet mapping applications are currently being hosted; NetDVD is one of the largest applications hosted within NetMap. All of the NetMap applications share a common theme wherein they display some additional information as an overlay on top of a common base map of our electric secondary and electric primary data. The Maps website enables the display of all types of electric, gas steam and telecom maps without using the core mapping applications that engineering uses to draw. The Maps website has read-only access for all users with a valid domain id and hosts almost 50,000 maps. Con Edison maintains 38 software applications that are used for map creation, map viewing and map-related functionality to support electric, gas, steam and other business units. There are 6 core mapping applications that range in age from 16-28 years. All of the core and many of the ancillary applications currently run on obsolete software where support is limited but the platforms are stable. At this time there is no enterprise plan to replace the platform, but it is recommended, where possible, that similar applications on obsolete technologies should be consolidated for better, longer term support and decreased maintenance costs. Both NetMap and the Maps websites are immediate support concerns. They are running on vendor-based server side software with limited vendor support that is not certified for Server 2003, although the applications are currently running on Server 2003. The Netmap application also has a dependency on Microsoft jvm (Java) which is not supported by Microsoft anymore and causes software conflicts with other software used for outage management (STAR). Neither of these platforms will run in their current state on Windows 7, IE9 and Server 2008.

Both applications use vendor software that incurs annually licensing fees. NetMap is powered by Bentley Publisher, a server based software that specializes in publishing MicroStation DGN and AutoCAD DWG type files over the internet. The Maps website is being powered by Intergraph's GeoMedia product. These applications also require a free plug-in from Intercap to support "cgm" file types and a Bentley ActiveX control to visualize maps within the browser. A previous attempt to upgrade the Netmap platform using Bentley Publisher software was unsuccessful due to performance issues that could not be resolved without a complete re-architecture of the platform. Based on the lessons learned in this attempt, IR has been researching an alternative. The goal is to define a solution that is less dependent on several different software products, can be

supported with in-house skills, minimizes software maintenance costs, and will be supportable on the next operating system, database and browser upgrades.

IR has been researching alternative methods and technology to visualize the core mapping applications and provide the above mentioned functionality within a single mapping visualization platform. One of the challenges in finding a solution is the density of the Con Edison data. There are approximately 290,000 underground facilities that must be displayable across the Con Edison service territory. Based on a proof of concept a combined vector/raster tile-based approach to visualization is recommended. This is the same approach that Google and Bing have taken for displaying their mapping data. Unlike Google and Bing, which primarily display raster data, Con Edison needs to display vector data to show and query facility details. A solution using Scalable Vector Graphics (SVG) is recommended. .

Justification:

*	Alternatives:	• Continue using current software in a controlled virtualized environment. • Work with Bentley and Intergraph to implement their respective solution, with continued dependence on their proprietary software solutions.
*	Risk of No Action:	The solutions that are currently in place will not be compliant with Windows7, Server 2008, and IE9.
*	Non Financial Benefit Explanation:	• Less vendor dependence on Bentley and Intergraph • Potential to use this application as a base framework for additional functionality • More current and non proprietary technology implementation • Opportunity to change the support model ? Less long-term contractor dependence. These applications were built and have been supported by incumbent contractors for several years. ? Opportunity to eliminate an Oracle database and replace with SQL Server and move it to a DBA support model rather than an Applications Services support model
*	Technical Evaluation and Analysis:	Proof of concept in progress to understand technology and evaluate performance.
*	Project Relationships:	Proposed project: Integrated GIS Solution Phase 0 Assessment

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$450	$232	$365	$365	$1,412

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$450	$232	$365	$365
Indirects					
Contingency					
Total	$0	$450	$232	$365	$365

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - Replacement of RAMIS MARKIV and Cognos Reporting Tools
Work Plan Category	Strat - System and Component Upgrades
Project Manager	O'Donoghue
Project Status	Not Started
Service Date	Dec 31 2016

Work Description:

Ramis and MarkIV are two reporting tools that are embedded in critical processes that support our business areas. These tools have been used to generate analytical and financial reports used throughout our Customer Service Systems, Rate Engineering, Vehicle Management and Distribution Equipment systems. Both Ramis and Mark IV are obsolete tools no longer supported by the vendors from which they were purchased. The technical skills required to support and maintain these programs are no longer available in-house or in the marketplace. The goals of this project are the following:

1. Evaluate all existing reports and categorize as follows:
a. No longer needed
b. Can be replaced by an adhoc reporting tool
c. Critical to the business. These must be replaced by a new and fully supported report program.

2. Reports that are no longer needed will be removed from the production batch process.

3. For those reports that need to be replaced by an adhoc reporting tool, design and build the new reports using Con Edison's business intelligence platform.

4. For those reports categorized as critical to the business, these will be upgrade using the latest release of COBOL LE.

Justification:

• Reduce the risk of having unsupported technologies embedded in critical business systems.
• The technical expertise to support Ramis and Mark IV does not exist at Con Edison or at any outside vendor resources. By eliminating the use of these technologies, we will be in a better position to implement changes and enhancements to the systems as directed by the business.
• Provide self service capability to our business clients.
• Any system changes to the mainframe environment may render these processes inoperable.
• Eliminate the licensing cost associated with the use of these obsolete products

* Alternatives: Since these technologies are obsolete, there are limited alternatives. One

alternative is to propose a more costly solution to build a central data repository and provide corporate wide adhoc reporting capability

* Risk of No Action: By no action, we run the risk that the products will stop working without warning due to a change in the mainframe software environment. In this case, the businesses will no longer receive critical reports.

* Non Financial Benefit Explanation: Self service adhoc reporting capability to the business. Improve performance by proving a maintainable product

* Technical Evaluation and Analysis: Approximately 74 Ramis modules and 31 MarkIV modules identified for analysis.

* Project Relationships:

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$225	$116	$182		$523

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$225	$116	$182	
Indirects					
Contingency					
Total	$0	$225	$116	$182	$0

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - Replacement of Transform Applications
Work Plan Category	Strat - System and Component Upgrades
Project Manager	O'Donoghue
Project Status	Not Started
Service Date	Dec 31 2016

Work Description:

This is a technology obsolescence project to replace applications written in Transform, a CASE tool that generates COBOL code. Computer-aided Software Engineering tools were popular in the early 1990's prior to client server and web applications to provide a platform for faster application creation in an integrated environment that moves requirements to design to code. With the decline of mainframe development, CASE platforms including Transform lost market share and eventually vendor support. Transform Logic Corporation no longer exists.
The options to decouple the Transform applications from the platform include:
• Replace the application with as is functionality in a current development platform, such as .net
• Acquire an commercially available solution with like functionality
• Refurbish the application in COBOL with design documentation extracted from Transform (as-is functionality and mainframe platform)
The applications written with Transform are:
• Central Engineering Estimating System (CEES) (this application is used by other business areas besides Central Engineering)
• Distribution Equipment Management System (DEMS)
• Fuel Inventory Management System (FIMS)
• Gas Auto Data Acquisition Meter Shop (Gas ADAMS)

Justification:

With only one remaining Transform-experienced IR Application Services professional, the company is at high risk of losing the ability to maintain applications developed using the Transform platform. Once an application is modified outside of the Transform platform (i.e. using native COBOL) the ability to generate the code through the Transform platform is compromised at best and likely impossible. The automated documentation that the platform provides is no longer reliable and not easily accessible to developers without Transform experience.

Unsupported technology in computer systems is a critical component of Information Resources' risk profile. The effort to migrate systems to the newer SQL Server 2008 database processing platform directly impacts other risk components, such as our ability to avoid failures to critical business applications and unauthorized access or loss of sensitive data,.

* Alternatives: Transform is no longer a vendor supported project and training is unavailable. Some applications may require rewrite for functional reasons.

Analysis would be required to determine whether each Transform application should be a technology upgrade or whether they should stand on their own as a new system development. Additionally, further work is required to verify that all Transform applications have been identified.

* Risk of No Action:

The systems will run, however the risk exists that a patch, operating system upgrade, database upgrade or changes in hardware technologies touching them would cause systems to fail or become unstable. That would force us into a situation that would require immediate attention and based on the timeframe to remediate some systems cause security or functionality impacts to the Company. With only one IR professional remaining with the knowledge to support these applications, the company is highly vulnerable should the one professional become unavailable

* Non Financial Benefit Explanation:

Technology around the systems could be upgraded rendering the older technologies unable to run in those environments. The inability to run could have business impact if the system is unavailable or unstable.

If the systems must run in their current state it could prevent us from upgrading hardware, databases, operating systems and utilities that work in conjunction with these systems. The impacts range from not being able to leverage capabilities in newer technologies, to increased support effort required to isolate these systems, to the inevitable failure of critical systems to operate.

* Technical Evaluation and Analysis:

Analysis is done prior to mitigating technologies to determine whether it would be more beneficial and cost effective to replace the system versus remediate it

* Project Relationships:

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$675	$347	$547		$1,569

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$675	$347	$547	
Indirects					
Contingency					
Total	$0	$675	$347	$547	$0

Capital – Shared Services - Information Resources

Project Name	Business Systems Sustainability - Upgrade Applications to Windows Server 2008
Work Plan Category	Strat - System and Component Upgrades
Project Manager	O'Donoghue
Project Status	Not Started
Service Date	Dec 31 2017

Work Description:

In order to upgrade our core server operating system to Windows Server 2008, we must also upgrade our corporate web applications to operate in this new environment. While the new operating system improves the security and reliability of the Company's infrastructure, it requires older systems, such as those written in the older (Classic) Active Server Pages, to be rewritten and upgraded as well. The maintenance and use of applications written in the older Classic ASP increases the maintenance costs and risk to business systems. These applications span different business areas and perform critical business functions. Extending their lifespan is critical to the overall business. This project's effort is to rewrite these affected applications in a more modern language that aligns with Con Edison's strategic roadmap. Upgrading these applications will not only extend the application life, but will also allow the Company to maintain and enhance our systems to meet the business needs over the coming years in an efficient, cost effective manner.

Justification:

Classic ASP is an antiquated, static web development platform that poses much risk as other development platforms continue to mature and operating systems continue to be updated. Such is the case in our current deployment of Windows Server 2008 operating system. As described above, while the new operating system improves the security and reliability of the Company's infrastructure, it requires older systems, such as those written in Classic ASP, to be rewritten and upgraded as well.

Classic ASP was originally meant as a free form easy to use language that could generate web pages in relatively short time. But it's limited in scope and cannot be enhanced to run on current technologies, falling behind in several aspects of its newer counterpart- ASP.Net. Security, specialized infrastructure requirements, limited functionality and limited resources are a few of the risks that can be attributed to the Classic ASP platform.

The platform also has inherited problems of its own, the most predominant one being the fact that if one classic asp page misbehaves, it potentially could bring down the entire web site. Again, IR mitigated the risk a few years ago by splitting up applications – but that came with a hefty price tag as a myriad of issues followed: more servers were required increasing IR's budget, space to house these servers had to be found, redundancy and disaster recovery concerns had to be addressed, software deployments became more involved, more LAN support was needed, developers had to know which box they could run on as to not impact critical applications, etc.: in short IR had to double its support and increase its budget because

of the mixed platform.

Another problem with Classic ASP is that it's a very limited language. It is very code centric meaning that it is not an application framework and it was never intended as an enterprise development tool. It's a slower running platform, especially in an age when faster web page experience relates to a more positive experience especially when interacting with outside vendors and our customers. And because of its limited feature set, the presentation of some of the web pages can seem a little dated thus not portraying Con Edison as the forward minded company it really is.

ASP.Net was developed to solve these problems. It's easier and quicker for windows programmers to transition to, taking less time to train developers. And since it's very similar in syntax to vb.net, IR can leverage its own resource of skilled developers. ASP.Net reduces the amount of overall code, allows a separation of presentation level code from business rule code, and provides developers with a full object oriented toolset. It contains richer server controls supporting events, has a better, larger class library, and is a better development platform overall. IR has also created its very own ASP.Net libraries to cut down on development time. These libraries will never be available from within Classic ASP systems. This drives maintenance costs up and poses risks of systems that cannot mitigate the issue of reacting quickly to address business changes.

ConEdison has 60+ applications in production that are written in Classic ASP. So many of these systems are part of our core business functions such as: Occupational Health and Administration System (OHAS), the work tracking system for Electric Operations, Energy Services and Construction Management (ETrac), Environment Health & Safety's Action Tracking System (ATS), and even the self service oriented, customer facing "MyAccount". It is only a matter of time before a security patch or a new operating system cripples the platform altogether and potentially causes mission critical systems like these to fail, risking impact to business operations across the company.

* Alternatives: None

* Risk of No Action: Failure to migrate to the new language platform will result in:
• Higher incremental support costs from Microsoft, starting at $200K - $800K per year, over the first 3 years under our Microsoft extended support agreement.
• Reduced availability of critical business applications. As more applications become integrated failures in any application will affect others but recovery and impact will be delayed without the focus prescribed in this project.
• Technology in computer systems becomes unsupported resulting in a materially adverse impact on the Company.
• IR being unable to develop,attract,and retain employees that have the skills to operate in IR's evolving technology portfolio.
• Older operating systems required to support older technologies will be at greater risk of security cyber threats

* Non Financial Benefit Explanation:
* Technical Evaluation and Analysis:
* Project Relationships:

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$675	$347	$547	$1,100	$2,669

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$675	$347	$547	$1,100
Indirects					
Contingency					
Total	$0	$675	$347	$547	$1,100

Capital – Shared Services - Information Resources

Project Name	Identity Management
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Terry Walsh
Project Status	Ongoing
Service Date	Dec 31 2017

Work Description:

Evaluate and implement software products to enhance security and control over all aspects of identity management. Implement an in-house Public Key Infrastructure (PKI) to create in-house certificates for data encryption and other advanced security features. In 2011, evaluate and implement Hardware Security Module (HSM) devices, to protect the encryption keys of Con Edison's Certificate Authority (CA) servers. Evaluate products such as Microsoft Forefront Identity Manager (FIM), Quest Active Roles server, and others to identify and implement new provisioning tools for identify management.

Future initiatives include the use of two-factor authentication, bio-metrics, and Network Access Control (NAC) to further improve Identity Management capability

Justification:

Identity management processes include provisioning of users, password management and self-service, and single-sign-on across platforms and applications. Robust automated processes to control all aspects of identity management are essential in limiting errors that can result in inappropriate exposure of secure business or personal data.

Products in this space enable us to enforce workflow rules, improve accountability, and keep appropriate levels of detail in logs for all of our identity management processes. Common off-the-shelf vendor products can replace difficult-to-maintain home-grown applications in this area. These services provide a base upon which we can implement advanced security measures – such as two-factor authentication, secure encrypted e-mail and data, and more.

An essential part of identity management and data security is the use of encryption and certificates. In-house Certificate Authority (CA) servers complement our use of Verisign certificates, at much lower cost. The addition of Hardware Security Modules (HSM) will protect the encryption keys for in-house certificate authority servers, improving security processes and auditability. This will put Con Edison in position to provide trustworthy in-house certificates for more applications.

The SDAU application is used to provision users in Active Directory. SDAU was developed in-house in the 1990's using the VB6 programming language, now obsolete. Today, there is no supported tool for developing

updates or enhancements to VB6 applications, including SDAU. SDAU does not meet all of our security requirements, and must be replaced by a tool which can facilitate new security capability.

Identity Management projects identified in this white paper address departmental and Corporate risks associated with:

- Cyber attack
- Rogue Employee
- Unauthorized access or loss of sensitive data
- Unsupported technology in computer systems

* Alternatives:

Each of the recommended components of this project have distinct alternatives, described here:

A trustworthy audit trail ensures the validity of in-house certificates. Without this, we will not be able to use in-house certificates for some applications. The alternative is to purchase Verisign certificates for those applications, and spend more on Verisign certificates. It is more cost-effective to implement HSM devices.

The alternative to evaluating and purchasing an off-the-shelf product is to develop a new tool in-house to replace SDAU. However, a custom identity management system is less cost-effective in the long-run, lacking on-going vendor support, maintenance, and updates to support new security features at a reasonable cost.

* Risk of No Action:

.Risk includes limited access controls on sensitive financial information, and inability to apply auditing rules and best practices for administrators. Also, the use of separate user ids and passwords for UNIX systems increases the likelihood that passwords will be lost, forgotten or worse written down where once compromised the loss or modification of important information is possible

* Non Financial Benefit Explanation:

The proposed projects will provide the following benefits:

- Improved processes for server and application security administration
- Improve controls on access of critical systems and information
- Improved application system delivery time
- Improved accessibility and availability for users
- Improved audit ability

* Technical Evaluation and Analysis:

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

* Project Relationships:

This technology is critical to a secure and successful implementation of the Project One and Work Management Systems. All other UNIX implementations will be backfilled according to the plan

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$222	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$339				$339

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-	$81	
M&S	-	-	-	-		
A/P					$43	
Indirects					$98	
Contingency						
Total	$0	$0	$0	$0	$222	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$339			
Indirects					
Contingency					
Total		$339	$0	$0	$0

Capital – Shared Services - Information Resources

Project Name	IT Asset Management
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Denise Reid
Project Status	Ongoing
Service Date	Dec 31 2017

Work Description:

There are several systems included in this program including:

Information Resources Inventory System (IRIS) provides a full inventory of the company's LAN Rooms, LAN Cabinets, Server Rooms, Server Farms and Telecommunication Rooms together with the equipment they contain. This equipment includes batteries, battery racks and uninterruptible power supplies (UPS'). The application also provides reporting functions for regulatory compliance regarding battery acid levels and room inspection features.

The application will be enhanced to support physical and virtual servers, routers and switches through a full integration with the Network Operations Center (NOC) Universal Configuration Management Database (UCMDB) software as well as support the efforts related to completion of the SARA Title reports annually.

Information Resources Contractor Management System (IRCMS) is a web-based system for managing contractors that work in IR. The system interfaces with managers, vendors, contractors, and other Con Edison employees involved in the request, selection and administration of contractors. The functions the system performs include: a) acquiring a contractor: b) time reporting and c) data repository. IRCMS is a central repository for bids, resumes, and contractor information which includes start/end date, rates, Order Release #, hiring manager, projects assignments, etc.

IRCMS provides a single, expeditious manner for engagement of staffing resources and related time reporting and record keeping. The latter point has proven effective in reducing costs and improving productivity, as billed hours are more readily available for review and contractual analysis. Future enhancements to the system include evaluations, performance reporting, fixed price/lump sum bid information, validation of purchase orders and expenditure tracking for cost management, many of which are performed manually today. These enhancements will provide managers and directors with information to assist in contract oversight and utilization

Justification:

IRIS currently manages over 500 rooms and 3000 pieces of equipment. This equipment occasionally gets moved around or replaced and new equipment gets added to existing rooms. Updating the location of this equipment is currently a manual process. With the introduction of servers and switches, the number of individual devices that need to be managed

could easily double.

Integration with the NOC UCMDB software will automate most of the process by allowing the UCMDB software to do network discovery of devices while IRIS keeps track of their actual physical location. Through an updated Dynamic Host Configuration Protocol (DHCP) naming scheme, IRIS will be able to automatically detect when a device on the network is moved or a new one gets installed and will also be able to narrow down its physical location to a handful of rooms. This not only reduces the manual effort involved in keeping the inventory accurate, but also eliminates most causes for user error.

IRCMS is a web-based system for managing the contractors that work in IR. The system interfaces with the Hiring Manager, vendors, contractors, and other Con Ed employees involved with contractor administration. The functions that it performs are as follows: 1 - Acquiring a contractor: When a hiring manager has a need for a contractor, they can create the scope of work on IRCMS. When they submit the scope, it will be emailed to the approved vendors. The vendors can then logon, review the bid, and submit candidates. Once the candidates are submitted, the hiring manager reviews submittals and selects the candidates. Once selected, the hiring manager submits a request for an Order Release that will automatically be forwarded to their manager for approval. Upon approval, the request is forwarded to Operations Support to issue the Order Release and the hiring manager is notified when completed. 2 - Time Reporting: IRCMS is used for contractors to submit their estimated time for the upcoming month as well as their actual time sheets for the hiring manager to approve. The estimated hours submitted is used by Operations Support for the accruals for the month. 3 - Data Repository: IRCMS is a central repository for the all bids, resumes, and contractor information. The contractor information includes, start/end date, rates, Order Release, hiring manager, projects worked on, etc. Reporting can be run to see all contractors that are in IR (Staff Augmentees, Service Contractors, Independent Assessors). The system also provides current (2011), 2012 and future year budget information

***** Alternatives:

• IRIS Maintenance and updating of the hardware equipment inventory could be kept as a manual process as in its current state. However this has proven to be both very time consuming and error prone with the current number of devices. With the addition of more device classes such as servers, routers and switches, the efforts required to maintain the inventory could increase by an order of magnitude. This would ultimately lead to an inaccurate inventory.

• IRCMS All reporting, validations, analysis would continue to be done manually to ensure compliance with order release terms. Detailed historical information would not be available to assess vendor performance in this competitive area.

***** Risk of No Action:

• IRIS Getting accurate and timely information regarding the physical location of a device will be very time consuming, Compliance reporting for a location might be inaccurate. Keeping an up-to-date inventory will require that every person installing new equipment or performing

maintenance on equipment manually update the inventory to reflect the changes

• IRCMS Inability to provide up to date and accurate staffing contractor information for monthly financial reports and contract related administrative actions (awards, performance analysis, etc)

* Non Financial Benefit Explanation: IRCMS Productivity improvements would be realized through the mechanization of several steps that are currently performed manually

* Technical Evaluation and Analysis: IRIS - There are currently on-going talks with members of the NOC team to find the most seamless and effective way to accomplish this integration with the UCMDB software.

IRCMS – modifications have been identified, estimates being evaluated

* Project Relationships: IRIS Full integration will only be possible once the UCMDB software is live.

IRCMS Project One interfaces must be analyzed for impact

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$253	$253	$281	$281	$1,068

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$253	$253	$281	$281
Indirects					
Contingency					
Total	$0	$253	$253	$281	$281

Capital – Shared Services - Information Resources

Project Name	Data Center Renovation Network Operation Center
Work Plan Category	Strat - Strategic IT Enhancements
Project Manager	Jamie Prettitore
Project Status	Ongoing
End Date	Dec 31 2017

Work Description:

One of the goals of the data center renovation project is to construct facilities that would support a Network Operations Center (NOC). The NOC would be constructed in the data center in close proximity to critical corporate IT resources. The NOC facility would be staffed 24/7/365 by experienced systems analysts who would conduct enterprise-wide predictive, condition-based monitoring of Business Application, servers, networks, communications, and infrastructure in order to meet expectations for 24/7 availability of critical computing and communications resources.
The major objectives of the NOC implementation include:

• Design and implement the physical control room structure that will achieve monitoring objectives through the efficient use of audio/video technology and location of personnel resources.
• Evaluate and implement enterprise monitoring software tools that will enable real-time predictive and proactive monitoring capabilities.
• Centralize the organizational roles for monitoring of infrastructure, applications, telecommunications, facilities, Help Desk and mainframe operations.
• Consolidate routine operational maintenance activities.

A future phase of this project would include an alternate NOC back-up location

Justification:

Information Resources currently performs decentralized monitoring of its telecommunications, mainframe and distributed systems, with limited monitoring of facilities related resources.
The current decentralized monitoring model is not operating at optimal operational efficiency. Centralizing and consolidating operational staff into one physical location would enable Information Resources to focus on strategic initiatives that support business goals and Con Edison's commitment to electric, gas and steam customers.
Establishing a centralized monitoring model through a NOC will also:
• Reduce the risks and vulnerabilities associated with network outages by consolidating monitoring responsibilities under one organization.
• Reduce the likelihood of downtime of IT resources through proactive and predictive monitoring.
• Improve operational efficiency through enhanced controls and improved operating processes.
• Improve communications and coordination between internal support groups

• Improve scheduling and change management strategies.
• Improve the coordination of third party circuit carriers, i.e., Verizon, response by evaluating current outages and prioritizing their repair.
• Improve relationships and communication with our customers, end users, by establishing Service Level Agreements that will dictate when a resolution is expected. Timeliness in both resolving customer issue(s) and timeliness of updates regarding the status of requests accounts for more customer satisfaction.
• Create an ergonomically correct work environment for NOC operators that helps prevent unnecessary strains on the body and accidents. This also reduces stress on employees, which helps them perform tasks at higher levels

*	Alternatives:	Failure to improve monitoring capabilities will result in reduced availability of critical business applications. As more applications become integrated failures in any application will affect others but recovery and impact will be delayed without the focus prescribed in this project
*	Risk of No Action:	Failure to improve monitoring capabilities will result in reduced availability of critical business applications. As more applications become integrated failures in any application will affect others but recovery and impact will be delayed without the focus prescribed in this project
*	Non Financial Benefit Explanation:	The NOC will employ tools and processes that will enable the early prediction and potential avoidance of service affecting incidents. The resulting benefit will be optimized availability for critical business systems and the computing and telecommunications environments
*	Technical Evaluation and Analysis:	Organizational structure planning is in progress, monitoring tools have been identified for selection
*	Project Relationships:	

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$2,254	$23	$578	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$253			$550	$803

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	$430	$14	$291	
M&S	-	-	-	-		
A/P			$1,675	$2	$117	
Indirects			$149	$7	$170	
Contingency						
Total	$0	$0	$2,254	$23	$578	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$253			$550
Indirects					
Contingency					
Total	$0	$253	$0	$0	$550

Capital – Shared Services - Information Resources

Project Name	Program Change Management
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Steve Trovato
Project Status	Ongoing
Service Date	Dec 31 2014

Work Description:

The objective of this project is to improve management of program changes for the web and client/server corporate computing systems, to replace old technology used for the management of moves of code to production and to implement new controls to better manage change control. An intranet application will be built to replace the Release to Web (RTW) application that was built with technology that is not sustainable. The application will take requests from systems analyst for program migrations to test or production, and to create development builds, route the request to Systems Assurance and provide a documented history of actions taken. The application will automate most of the data entry currently performed by systems analysts. The application will be integrated with ChangeTrak and the Application Portfolio System to add needed program change process controls. The application will also provide needed reporting capabilities for program change requests that currently do not exist.

Justification:

Information Resources relies on the RTW system to control migration of program and data changes through the development, test and production environments for over 400 business applications. In addition, the RTW system automates program build (code compilation) for many applications. The current application was developed a decade ago in technology that is no longer sustainable. The application also uses unsupported 3rd party controls that no longer function properly under the current operating system versions.

The current process while partially automated does require significant manual entry of information readily available in the ChangeTrak and Application Portfolio System applications. Program migration problems occur due to a lack of integration between RTW and these other applications that are used as a repository for user requests and application inventory. Improvements in process controls and automated reporting to address SOX and control audits are needed to reduce costs for program migration.

The business drivers for upgrade and enhancement of RTW include:
Avoiding increased costs associated with use of an unsustainable technology
Productivity improvements within business processes by elimination of unnecessary steps and automated collection of information
Improved Sarbanes Oxley compliance through addition of reporting capabilities
Improved change control through integration with ChangeTrak to

associate migration with change design, testing and approval status

*	Alternatives:	• The new application will automate several program change management business processes, be integrated with ChangeTrak and the Application Portfolio System and address company SOX controls and reporting. An alternate would be the costly integration and customization of a vendor package
*	Risk of No Action:	• Continued control weakness for program change control and SOX control • Continued manual entry of information available in other applications • Continued manual reporting for audited controls • Lack of information for improvement of program change control processes • Old programming technology not sustainable with new versions of Windows operating system, Internet Information Service (IIS) and SQL Server database. • Nonfunctional application code with unsupported 3rd party controls under new operating systems. • Possible loss of system availability if a Microsoft patch impacted the aging RTW code.
*	Non Financial Benefit Explanation:	Improved analysis can be done of program change control processes based on process data not currently collected or available for reporting. The value of program migration change control is difficult to estimate but significant costs would be encountered without a migration control program to prevent errors in programs migration that would result in disruption of production applications and business processes
*	Technical Evaluation and Analysis:	Use cases have been developed for build, test and production move processes for intranet, Internet and client/server. Data modeling has been completed. Database design and application development are in progress.
*	Project Relationships:	

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$89	$167	

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$113				$113

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-	$56	
M&S	-	-	-	-		
A/P				$89	$79	
Indirects					$32	
Contingency						
Total	$0	$0	$0	$89	$167	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$113			
Indirects					
Contingency					
Total	$0	$113	$0	$0	$0

Capital – Shared Services - Information Resources

Project Name	Enterprise Applications
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Terry Walsh
Project Status	Ongoing
Service Date	Dec 31 2017

Work Description:

Introduce standards and enterprise platforms for the development and deployment of business systems in a diverse and redundant fashion. Provide a supportable and enabling enterprise level infrastructure for email, application reporting, file serving and file exchange with external partners.

Justification:

: Enterprise Applications are infrastructure components that provide cyber security authentication and processes needed for access to the network and business applications, including email systems and the Intranet and Internet. The plan proposes implementing the following technologies to; establish and maintain email communications; maintain a cyber secure authentication platform; create an environment for deploying business system applications including the use of standard development tools and a lab testing environment to ensure compatibility with new technology and software versions.. Enable cyber secure and auditable solutions for serving and exchanging information with employees and external business partners.

Enterprise Application projects identified in this white paper address departmental and Corporate risks associated with:

- Unsupported Technology in Computer Systems
- Failure of the Email System
- Unauthorized Access or Loss of Sensitive data
- Cyber Attack

Planned projects include:

- Exchange Upgrade
- Active Directory Upgrade
- SharePoint Infrastructure upgrades
- External information exchange with partners
- Business System testing Lab and supportability

* Alternatives:

The alternative is to decentralize the IT infrastructure and allow each business area to deploy systems on any selected platform without consideration for integration with other infrastructure components and without the proper level of testing. And upgrading components in the infrastructure as necessity dictates, rather than keeping current versions resulting in poor reliability. This would also present a significant risk of

		needing or relying on unsecure and unsupported software versions and the inability to plan project deployment.
*	Risk of No Action:	The risk includes allowing current environment to become unsupportable introducing performance and reliability problems as well as certain cyber security risks. As other industries adopt newer technologies Con Edison's ability to interact and collaborate will become a challenge. Business system rollouts will become problematic without investing in the proper test and lab tools.
*	Non Financial Benefit Explanation:	Active Directory provides critical cyber authentication for access to the Company network and additionally for resources once on the Company network. Recent advances in the technology improve performance and provide additional layers of security for applications and users. Sharepoint provides a portal solution for all intranet applications as well as sites to organize team activities and store content. With the introduction of large ERP type applications like HR/Payroll, WMS and Project One, Con Edison needs to improve its ability to test changes and perform regression testing for additional components in the infrastructure and business systems portfolio to avoid introducing risk to these applications and improve delivery time of essential changes.
*	Technical Evaluation and Analysis:	Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, vendors and Company employees ensure the selection of the optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout.
*	Project Relationships:	Current and future business applications require infrastructure platforms to be available and supportable to ensure reliability, security and accessibility. Regulatory and financial business requirements for sending and receiving electronic content require security and reliability

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$871	$815	$478	$525	$2,689

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$871	$815	$478	$525
Indirects					
Contingency					
Total	$0	$871	$815	$478	$525

Capital – Shared Services - Information Resources

Project Name	Collaboration Tools
Work Plan Category	Strat - System and Component Upgrades
Project Manager	Terry Walsh
Project Status	Ongoing
End Date	Dec 31 2017

Work Description:

Provide an environment for employees to collaborate and communicate using latest desktop and office tools. Enable employees and teams to collaborate and share information in an efficient and organized fashion. Improve productivity through efficient workflow tools. Efficiently use computing hardware and network assets by minimizing duplication and dated files. Improved communications among employees by providing other alternatives to email and traditional telephone

Justification:

Implement the following technologies to maximize employee productivity through collaboration and workflows. Enable trusted outside entities a secure method to access limited but required information. Provide improved methods of communications among mobile employees. Collaboration Tools projects identified in this white paper address departmental and Corporate risks associated with:

- Unauthorized access or loss of sensitive data
- Unsupported technology in computer systems
- Development, attraction and retention of employees

Planned projects include:

- Web Server upgrades
- PDA Video Streaming
- Video Conferencing
- Video presentation solution
- External Sharepoint sites
- New personal device evaluations
- Enterprise Instant Messaging architecture
- Web Conferencing
- Electronic Whiteboarding and file collaboration

* Alternatives: The alternative is to continue operating in the same fashion with centralized offices supplemented with travel to and from meetings as required. Continue with paper and inefficient workflows used for approvals and record keeping. Maintain travel requirements. Business relies heavily on physical presence and dated information

* Risk of No Action: Risks include the loss of important paper records, delays in getting correct information and project deliveries because of scheduling conflicts. New employees and contractors will be unable to be productive because of the

dated office toolset. Failure to increase employee productivity resulting in an inefficient workforce and office processes. Loss of savings associated with improved access to personnel resources and information.

* Non Financial Benefit Explanation: The proposed projects will provide the following benefits:

- Faster access to the real-time video and information
- Improve office workflows and access to SMEs
- Improve employee skill sets
- Enable flexible labor sourcing options through latest office toolset

* Technical Evaluation and Analysis: Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, vendors and Company employees ensure the selection of the optimal solutions. Each implementation is done with technology evaluations and commercial RFPs before selection and rollout

* Project Relationships: Projects selected are used by all employees to improve the ability to deliver business value on selected projects during planning, design and implementation phases. These projects support the "Way we Work" principles by enabling teams and open communication

Current Working Estimate:

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$294	$500

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
	$259	$512	$512	$250	$1,533

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-	$20	
M&S	-	-	-	-		
A/P					$249	
Indirects					$25	
Contingency						
Total	$0	$0	$0	$0	$294	$0

EOE	2013	2014	2015	2016	2017
	-	-	-	-	-
M&S	-	-	-	-	-
A/P*		$249	$492	$492	$240
Indirects		$10	$20	$20	$10
Contingency					
Total	$0	$259	$512	$512	$250

Capital – Shared Services - Information Resources

Project Name	Consolidated Mapping and Visualization Platform (CMVP)
Work Plan Category	Strat-System and Component Upgrade
Project Manager	Karen Stanford
Project Status	Not Started
Service Date	Dec 31 2017

Work Description:

Con Edison maintains 38 software applications that are used for map creation, map viewing and GIS[1]-like functionality to support the electric, gas and steam business processes. The Consolidated Mapping and Visualization Platform will consolidate the entire mapping platform (38 applications). This plan will include spatial alignment of all Con Edison data using a common landbase and real world coordinates. Implementation will be integrate engineering design, work across commodities, communication with external stakeholders, maps & records, and spatial analysis.

Justification:

The current platform does not fully meet business needs. Current business issues include the following:

- Data between the six core applications has limited interchangeability and display capability. When new assets are added to the system (i.e. new electric manhole) the current process is to record it multiple times including adding it to the M&S, C&DO and then the Primary. Not only is data entered multiple times, it also causes inconsistencies.
- The current mapping applications maintain 12 base maps and proprietary coordinate systems. This requires data to be converted in order to share data across commodities, between electric regions, within electric maps (C&DO, M&S and Primary maps) and with external stakeholders (City, water and sewer, and communications facilities).
- Different platforms require different skill sets for engineering groups. It is difficult to interchange staff without retraining.
- No self-service reporting or map products available.
- Business areas are pursuing other projects because current platform does not meet needs.

From a technology perspective, parts of the platform at a high risk for obsolescence and currently run on software that cannot be upgraded and must be replaced.

[1] GIS – geographic information system. An integrated collection of computer software and data used to view and manage information about geographic places, analyze spatial relationships, and model spatial processes. (A to Z GIS. ESRI Press. 2006).

*	Alternatives:	None. The only viable option to reduce the risk of system downtime without incurring additional maintenance costs from Microsoft is to be proactive in migrating to a supported technology platform.
*	Risk of No Action:	The risk of no action may result in: • Higher incremental support costs from Microsoft. If the platform is not upgraded, the Company must choose between running on an unsupported operating system (Server 2003) in July 2015 or pay custom support to Microsoft. Custom support costs are estimated to double annually begin at $1.2M in July 2015, jump to $4.8M in 2016 and double annually. • Reduced availability and security for critical business applications. • Key applications remain on an unsupported technology • Lost opportunity to leverage the current investment in work management and integrate work with spatial analysis.
*	Non Financial Benefit Explanation:	The business benefits are envisioned to include the following: • O&M cost avoidance for Microsoft custom support • Minimize inherent risks associated with an enterprise-wide mapping replacement by implementing only a subset of the platform initially. • More robust visualization tool will be implemented to create and display map-products • A standard integrated platform will simplify and reduce the time require to record new assets to the maps and issue design work. By integrating workflow starting with design and ending with as-built, data will no longer need to be entered twice reducing man-hours spent, first when designed and then when the as-built layouts are returned to be mapped. • Implementing a common, real-world coordinate system will make it easier to overlay and share data across commodities, between electric regions, within electric maps and with external stakeholders (city, water, sewer and communications, OEM, etc.). • Establish standards for mapping process that results in cost savings by leveraging common work processes and software. Employees trained to map and issue layouts will now have the ability to work in many areas within the company without having to undergo extensive training on new applications. • Leverage investment in WMS with integration to Logica Asset Management. • Provide self-service tools for ad-hoc reporting and visualization.
*	Technical Evaluation and Analysis:	Analysis is done for each application to determine the most cost effective approach to replace or remediate the system. Both short term and long term plans were made to meet our deadlines.
*	Project Relationships:	None

Current Status: Not started

Funding: ($000s)

Funding Cost	2013	2014	2015	2016	2017	2018	2019	Total

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$0

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$0	$0	$10,000	$15,000	$15,000	$40,000

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$0

EOE	2013	2014	2015	2016	2017
Labor	-	-	$2,000	$2,000	$2,000
M&S	-	-	-	-	-
A/P*			$6,200	$11,200	$11,200
Indirects			$1,800	$1,800	$1,800
Contingency					
Total			$10,000	$15,000	$15,000

Capital – Shared Services - Information Resources

Project/Program Title	Steam Billing System and Customer Service Enhancements
Project Manager	Vinnie Marketta
Status	In Progress
Estimated Service Date	July 2011 – December 2013
Work Plan Category	System Enhancement/Process Improvement

Work Description:

The work identified in this steam billing system enhancement project will provide a number of steam billing system and customer service improvements that will enhance the steam customer experience, support operational needs, and reduce the Company's exposure to uncollectible bills. Customer Operations has provided the specifications to the vendor Oracle for the items to be worked during 2011 & 2012, including:

2011

Customer Experience Enhancement

- Web Self Service (WSS) administrative rights
- Account Financial History enhancement
- E*bill – paperless customer billing
- Disconnect bill messaging

Credit Automation Enhancement

- Automation of disconnect letters

2012

Customer Experience Enhancement & Credit Automation

- Pay-Online
- Payment agreement deposit handling

- **Upgrade (pending SAC approval)**

2013

Customer Experience Enhancement

- Meter Scrolling

Credit Automation Enhancement

- Deposit request and calculation automation

- **Upgrade Completion**

2014 - 2017 Enhancements

Credit Automation Enhancement

- Payment agreement process automation & bill messaging *
- Posting process - automation of the posting of premises with multiple dwelling units prior to disconnection of service for non-payment as required by PSC *
- Uncollectible bills (UB) and collection agency process automation
- Level Payment Plan (LPP) reconciliation automation **
- Change of Customer improvement
- Turn-on/New Business improvement

** Submitted to Oracle*
***Specifications prepared*

A detailed projection was compiled for the 2011& 2012 improvements based on estimates from Oracle and Information Resources. The 2013-2017 improvements are similar to the items previously submitted. Therefore, these items are estimated to incur similar costs and provided the basis of funds requested for 2013-2017.

In last quarter 2011, Oracle informed Con Edison that the CC&B platform would no longer be supported. As a result, the enhancement project expanded its scope for the upgrade. The additional work identified in this project will provide an upgrade to the current steam billing system (CC&B). This upgrade will bring the system from its current unsupported 2.0 version to the supported 2.3.1 version. The vendor Oracle will be required to:

1. Installation of the application upgrade
   Oracle will provide an estimated one hundred and seventy eight (178) hours of assistance for the following installation services:
   a) Install the new CC&B v2.3.1 software.
   b) Upgrade the test database from v2.0.5 to v2.3.1
   c) Migrate up to ten (10) custom database views (used with reporting)
   d) Configure the new CC&B 2.3.1 environment.

2. Compilation and verification of the application upgrade
   Oracle will provide an estimated three hundred and twenty (320) hours of assistance to compile and verify the CC&B upgrade from version 2.0.5 to version 2.3.1 as described below:
   a) Convert, verify and compile up to eighty (80) custom COBOL modules
   b) Migrate external connections for interfaces.
   c) Perform system testing associated with the custom COBOL modules and external connections

3. Preparation
   Oracle will provide an estimated one thousand three hundred and sixty (1,360) hours of testing assistance as described below:
   a) Provide technical and functional assistance to investigate and resolve issues uncovered during your testing phases.
   b) Provide function and technical assistance with review of configuration setting and environments for the CC&B instance.
   c) Assist with the testing of your defined test cases.
   d) Assist with performance testing of the new production environment.

4. Implementation
   Oracle will provide you with an estimated three hundred seventy six (376) hours of implementation, go-live and post go-live assistance as described below:
   a) Assistance with the migration of CC&B v2.3.1 to the production environment.
   b) Provide go-live assistance.
   c) Provide up to one hundred sixty (160) hours (which are included in the three hundred seventy six hour above) of post go-live assistance.

Con Edison staffing would have the following obligations:

1. Maintain the properly configured hardware/operating system platform to support the services.
2. Obtain licenses under separate contract for any necessary Oracle software and hardware programs before the commencement of services.
3. Maintain annual technical support for the Oracle software and hardware under separate contract throughout the term of the services.
4. Provide Oracle with full access to relevant functional, technical and business resources with adequate skills and knowledge to support the performance of services.
5. Provide, for all Oracle resources performing services at your site, a safe and healthful workspace (e.g, a workspace that is free from recognized hazards that are causing, or likely to cause, death or serious physical harm, a workspace that has proper ventilation, sound levels acceptable for resources performing services in the workspace, and ergonomically correct work stations, etc.).
6. Provide any notices, and obtain any consents, required for Oracle to perform services.
7. Limit Oracle's access to any production environment or shared development environments to the extent necessary for Oracle to perform services.
8. As required by U.S. Department of Labor regulations (20 CFR 655.734), you will allow Oracle to post a Notice regarding Oracle H-1B employee(s) at the work site prior to the employee's arrival on site.

9. Assign a full-time project manager to lead your staff's effort.
10. Arrange for a project executive sponsor.
11. Handle security setup.
12. Handle production setup with assistance from Oracle.
13. Install environments
14. Create test plans and perform the regression and performance testing
15. Provide required resources to test the system functionality per plan timelines.
16. Handle any necessary changes to non-Oracle systems.

There will be a requirement of 3-4 additional servers for upgrade and hosting of test environments. As a result of the unanticipated need to upgrade to the current version of CC&B, some of the originally planned enhancements listed above are being withheld until after the upgrade's completion. Funding would be reallocated to the upgrade effort to begin in the last quarter of 2012, pending SAC approval. Since the enhancement project is projected to be completed by the second quarter 2013, the original $200,000.00 requested for the 2013 non-upgrade related work will be used to work some of the listed enhancement items. The work planned from 2014-2015 is planned to be funded through the 2013 rate case filing for steam.

The projection also includes an expected 2017 upgrade will be needed. On average support from Oracle is only for the two most current versions, giving a system approximately as estimated 5 year lifespan before requiring an upgrade.

Justification:
Steam customers generate over $600,000,000.00 in annual revenues. Upgrades to the system will be necessary to enhance customer service. The proposed enhancements will afford our steam customers the same options as our electric and gas customers and provide steam customers a higher level of service on their accounts. These enhancements would improve the overall steam customer experience and company image for some of the largest customers in Con Edison's portfolio.

When steam customers access web self-service and need assistance navigating the site or have questions about their account as shown online, Company employees cannot see what the customer sees on the current web site. Enhancements to WSS will include the development of super-user functionality that will enable us to provide concise, efficient responses to steam customer inquiries on our web site.

Presently, steam customers cannot make payments online and the only payment options available to customers are to mail check payments or, manually enroll in direct debit, or make a payment via telephone to a representative using their bank account information. The option to pay online will provide the customer a secure, faster, and preferred method of payment. The other customer experience enhancements will make the application and account establishment process and account analysis more fluid for SCSRs to work through with our customers.

The credit process enhancements (listed above) will improve steam bill presentation and messaging, as well as, internal automation of credit action. These enhancements will mirror the capabilities in place for electric and gas customers in CSS. As a result of the automation and enhanced system processes, the Company can minimize our exposure to uncollectible bills (UB). These system improvements will assist in keeping the customer informed of their arrears through automated notices, bill messaging, and building posting routines so that accounts can be fielded for disconnection more quickly, reducing our UB exposure. The automation of deposit calculation and requests will support this, as well.

The automation of credit processes will reduce manual work by a minimum of 0.5 human resources. This is attributed to the reduction of manual tracking/administration of the posting process; disconnect notices, LPP processes, and payment agreement delinquency. It was also determined that we can remain on the unsupported platform with minimal risk for the remainder of 2012. However, the risk outlined by the Oracle definition below was determined too great to extend into 2013, considering the revenue and customer impacted.

Unsupported Hardware Systems
Customers with unsupported hardware systems are not entitled to download or receive updates, maintenance releases, patches, telephone assistance, or any other technical support services for unsupported hardware systems. Parts in a covered hardware system may not be transferred to an unsupported system.

Estimated Completion Date: 12/31/2017

Status:

Funding ($000): CAPITAL

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011
-	-	$	$	$244

Approved 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Total 2013-2017
$325	$1,200	$280	$275	$-	$1,900	$3,655

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011
Labor	$	$	$	$	$ 20
*A/P	$	$	$	$	$212
Other	$	$	$	$	$ 12
Contingency					
Total	**$**	**$**	**$**	**$**	**$ 244**

Forecast

EOE	2013	2014	2015	2016	2017
Labor	$ 143	$ 26	$ 25	$	$ 560
A/P	$ 914	$ 228	$ 228	$	$ 986
Other	$ 143	$ 26	$ 22	$	$ 354
Contingency					
Total	**$1,200**	**$ 280**	**$ 275**	**$**	**$ 1,900**

Capital – Shared Services - Information Resources

Project Name	GridOps Load Forecasting Enhancements
Work Plan Category	Oper - Critical Repair
Project Manager	Carlos Villalba
Project Status	In-Flight Project
Service Date	April 30, 2013

Work Description:

This project includes the implementation of an upgrade to the GridOps Load Forecasting system, as well as upgrading the NDAuto and GridOps databases to a supported technology platform.

As a result of the Liberty audit, there is heightened focus on the accuracy and reliability of the Electric, Steam and Gas load forecasting functions. Energy Management's Forecasting Services is requesting the implementation of improved data validation to ensure the integrity of the short term forecasts, and the addition of an automated feed for Steam PI tags to facilitate generation of Steam forecasts. Simple validation is needed for the hourly load PI data to ensure the integrity of the forecasts. For example, currently there are no rules in place to check the hourly load values. In addition to functional enhancements, technology enhancements are required due to technology obsolescence and the business need to transition natural gas hourly forecasting to Energy Management. The current GridOps application would not support the complexity of the natural gas commodity in terms of a short term forecast. The GridOps database, as well as the automated system interfaces, currently run on SQL Server 2000. This technology platform will no longer be supported by Microsoft in early 2013, and must be upgraded to a later version of SQLServer in 2012. The vendor currently certifies the system on SQL Server 2005. In addition to a database upgrade, the interfaces must be re-written from DTS packages into SSIS packages.

Forecasting Services also requires transparency into the database in order to accommodate critical senior management reporting. Currently, Forecasting Services relies on a manual process to access a particular forecast and the backcast. This can be accomplished by providing a process to automatically offload temperature, load, backcast and forecast data into text files for reporting purposes.

Justification:

- Natural Gas hourly forecasting is currently done by Gas Control using an external entity. Our strategy is to consolidate all three commodities into one consistent platform. Currently, hourly natural gas forecasting is done by a university. A GridOps application upgrade would allow us to transition this responsibility to Energy Management/Forecasting Services.
- Improved data validation will reduce the risk of significant errors in the forecasts. These forecasts are used to influence how much energy is purchased by Electric Supply in the wholesale markets, and inaccuracies are extremely costly.
- Automation of Steam PI tags reduces the likelihood of errors introduced by manual data entry.
- Energy Management is a frequent area of audits, and requires strict compliance with SOX controls, and audit capabilities.
- The current technology platform will not be supported by Microsoft in 2013. In addition to losing vendor support, being on an unsupported technology platform may result in the system becoming unavailable if a security vulnerability cannot be patched.

- Electric morning reports are critical reports that are currently managed manually. Information from the GridOps is needed in order to facilitate an automated solution to this daily task.

Alternatives:
If system changes are not implemented, a manual process will need to be developed which is more labor intensive and error prone.
Replace system entirely.

Risk of No Action:
The risk of no action would be a loss of vendor support for a critical system. The system is required in order to support operations and maintain regulatory compliance.

Non Financial Benefit Explanation:
The non-financial benefits of this project are improved forecast reliability and obtaining vendor support.

Technical Evaluation and Analysis: N/A

Project Relationships: N/A

Current Status:
Project is in progress. The project started in May 2012 and has an estimated completion date of April 30, 2012.

Current Working Estimate:
This estimate is based upon the anticipated need for employees, contractors, and vendor effort for a 12 month project. This includes software licensing costs, and costs of hardware as well. Ongoing O&M includes both vendor and IR support.

Funding: ($000s)

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012
$	$	$	$	$	$850

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Approved/Forecast Total 2013-2017
$250	$	$	$	$	$250

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011	2012
Labor	-	-	-	-		
M&S	-	-	-	-		
A/P						$850
Indirects						
Contingency						
Total	$0	$0	$0	$0	$0	$850

EOE	2013	2014	2015	2016	2017
Labor					
M&S					
A/P*	$250				
Indirects					
Contingency					
Total	$250				

2013-16 Capital - Information Resources

Project Name	Telecommunications Storm Hardening Project
Project Number	
Work Plan Category	
Priority	
Project Manager	Terrence Walsh
Project Engineers	Various
Budget Reference	
Project Status	
End Date	Dec 31 2016
ERM Addressed	

Work Description:

Con Edison owns and operates a private communications network called the Corporate Communications Transmission Network (CCTN). This network is the vehicle that enables secure communications circuits for SCADANet, voice, video, protection and the computing and storage environment. CCTN enables computing resource consolidation, disaster recovery, as well as the reduction of public carrier cost savings. There are over 100 Company locations which host the equipment used by CCTN. The CCTN equipment is installed in communications rooms, communications huts and enclosures at the various facilities. Since the late 1980s, over 400 miles of fiber optic cable has been implemented to provide CCTN communications services. In most cases, these fiber runs were done in an efficient fashion by combining them with electric distribution cable installations.

CCTN also provides multiple radio systems to support voice to field crews and machine to machine smart grid applications. These private radio systems include one 800 MHz used for voice communications between control centers and field personnel and is called iCON. In addition we have multiple applications which support the distribution automation system called DAS running on 900MHz frequencies. These systems share an infrastructure of antenna sites throughout the service territory which enable communication to occur. This is similar in concept to a carrier cell towers and the cell phone. Projects have been established to maintain the radio networks and equip the antenna sites with the facilities and components needed to reliably operate.

The projects to harden the communications infrastructure against wind, rain and floods experienced during superstorm Sandy are described below.

A new CCTN fiber loop is required to provide telecommunications services to the three bulk power transmission substations in lower Manhattan that were adversely affected by prolonged outages to public carrier service during superstorm Sandy.

The following new fiber spans are planned for deployment in the 2014 to 2016 time frame:

• Add a new fiber span between 4 Irving Place and Leonard Street Substation;
• Add a new fiber span between Leonard Street Substation and World Trade Center substation;
• Add a new fiber span between World Trade Center Substation and Seaport substation;
• Add a new fiber span between Seaport Substation and Cherry Street Substation.
• Replace two CCTN huts at critical Con Ed facilities in low lying flood prone areas in Staten Island.

Reinforcement of antenna systems and implementation of backup generators at several critical CCTN and radio sites are required to ensure antennas remain in tact during storm with high winds that result in prolonged power outages like superstorm Sandy.

The following work is planned as completed through 2016:

• Evaluate antenna and line systems at all iCON and DAS radio sites and radio dispatch facilities with external antennas at the more than 50 locations to be addressed. Redesign, reinforce and replace antenna systems where necessary.

• Establish backup generator and tanks at Buchanan, Graymoor and North Castle CCTN radio facilities and procure mobile generators for tactical deployment.

Justification:

CCTN will provide these substations with a high-speed, reliable and cost effective alternative and compliment to public carriers. Communications requirements for data, voice, protection, SCADA and video circuits will result in the installation and deployment of modern communication technologies to many Company facilities. CCTN provides the network for SCADA, protection and data services to critical substations necessitating capital projects to improve diversity and capacity to those locations. CCTN has far surpassed the use of public carriers for communications and provides a corporate backbone for all communication services for the foreseeable future. Many major CCTN nodes possess diverse Points of Entry (POE) and redundant components including power sources to eliminate any single point of failure and provide redundancy and diversity. Substations are interconnected to the core CCTN network with fiber runs to support high speed services. Wireless technology is considered for redundancy and diversity when installing new fiber is not feasible or justified.

This project identified in this white paper address departmental and Corporate risks associated with:

• Total failure of carrier telecommunications
• Failure of critical business application
• Failure of the Email System
• Safety.

***** Alternatives:

The alternative to CCTN is to procure all communications from carrier services. This approach is not recommended due to failure rates associated with carrier circuits and the lead time associated with repair and new service

delivery. IR has developed a new approach to maintain fiber by proactively identifying small sections which are prone to failure and replacing them in advance.

* Risk of No Action: Risks include loss of service resulting from other infrastructure providers disrupting Con Edison fiber and impacting service.

* Non Financial Benefit Explanation: The proposed spans for CCTN at these Con Edison facilities offer the following other benefits:

- Ability to provide carrier diversity to critical communication circuits
- Offers the highest level of cyber and physical security
- Provide a higher reliability level than carrier circuits
- Scale capacity over time through card replacements
- Improved recovery time from communications failures
- Ability to provide services outside of the Telco carriers
- Avoid construction delays and costs needed for carrier services

* Technical Evaluation and Analysis: Information Resources performs planning and analysis on all technologies introduced. Solutions are investigated in conjunction with the IR strategy and vision planning process. Interaction with IT advisors, carriers, vendors and Company employees ensure the selection of the optimal solutions

* Project Relationships: IT projects, completed or future require and expect sufficient performance of the network.

Current Status: Not Started.

Current Working Estimate: Not Started.

Funding ($000): CAPITAL

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011
-	-	$	$	$

Approved 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Total 2013-2017
$	$	$1,300	$2,700	$2,600	$	$6,600

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011
Labor	$	$	$	$	$
*A/P	$	$	$	$	$
Other	$	$	$	$	$
Contingency					
Total	**$**	**$**	**$**	**$**	**$**

Forecast

EOE	2013	2014	2015	2016	2017
Labor	$	$	$	$	$
A/P	$	$ 1,300	$ 2,700	$ 2,600	$
Other	$	$	$	$	$
Contingency					
Total	**$**	**$ 1,300**	**$ 2,700**	**$ 2,600**	**$**