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February 28, 2013  
By Email for Electronic Filing

Honorable Jeffrey C. Cohen  
Acting Secretary  
State of New York  
Public Service Commission  
Three Empire State Plaza  
Albany, NY 12223

Re: Case 09-E-0428 Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service – Report on 2012 Capital Expenditures

Dear Secretary Brilling:

The Joint Proposal approved by the Public Service Commission in its "Order Establishing Three-Year Electric Rate Plan," issued March 26, 2010 in the referenced proceeding, provides for Con Edison to report annually its expenditures for the following categories of capital expenditures:

- Transmission and Distribution ("T&D")
- Shared Services allocable to Electric Operations, i.e., General Equipment, Emergency Management, Information Resources, Human Resources, Facilities, and Other
- Municipal Infrastructure Support by Lower Manhattan and All Other);
- Electric Production
- Finance and Supply Chain Enterprise Resource Project ("Enterprise Resource Project").

Submitted herewith for electronic filing is Con Edison's *Report on Capital Expenditures for 2012* in compliance with the Commission's order.

Very truly yours,

Cc: Active Parties – Case 09-E-0428

**STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION**

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Proceeding on Motion of the Commission :  
As to the Rates, Charges, Rules and Regulations of : Case No. 09-E-0428  
Consolidated Edison Company of New York, Inc. :  
For Electric Service :  
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**CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.**

**REPORT ON CAPITAL EXPENDITURES FOR 2012**

The Joint Proposal approved by the Public Service Commission in its “Order Establishing Three-Year Electric Rate Plan,” issued March 26, 2010 in this proceeding, provides for Con Edison to report annually its expenditures for the following categories of capital expenditures<sup>1</sup>:

- Transmission and Distribution ("T&D")
- Shared Services allocable to Electric Operations, i.e., General Equipment, Emergency Management, Information Resources, Human Resources, Facilities, and Other
- Municipal Infrastructure Support by Lower Manhattan and All Other;
- Electric Production
- Finance and Supply Chain Enterprise Resource Project ("Enterprise Resource Project").

This *Report on Capital Expenditures for 2012* consists of the following attached data sheets:

- Summary T&D Capital Plan, 2012 Capital Budget and Actual Spend
- System & Transmission Operations – 2012 Capital Budget and Actual Spend

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<sup>1</sup> Case 09-E-0428, Con Edison Electric Rates, “Order Establishing Three-Year Electric Rate Plan,” March 26, 2010, Joint Proposal, dated November 23, 2009, pp. 15-16.

- Substation Operations – 2012 Capital Budget and Actual Spend
- Electric Operations – 2012 Capital Budget and Actual Spend
- Shared Services Capital Plan – 2012 Capital Budget and Actual Spend
- Electric Production – 2012 Capital Budget and Actual Spend
- Capital Budget vs. Actual Variation Explanations<sup>2</sup>
- Rate Plan vs. Capital Budget Explanations
- Capital Unit and Unit Cost Data<sup>3</sup>

As provided in the Joint Proposal, the Company will schedule a meeting with Staff and the interested parties to review this *Annual Report on Capital Expenditures for 2012*.

Dated: February 28, 2013

CONSOLIDATED EDISON COMPANY  
OF NEW YORK, INC.

By 

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<sup>2</sup> Variance explanations are provided to the extent the amount spent on a project or program varies from the forecasted amount by more than fifteen (15) percent, for projects or programs with a forecasted cost greater than \$5 million but less than \$25 million, or by more than ten (10) percent for projects or programs with a forecasted cost of \$25 million or more. Supporting explanations are provided for projects and/or programs of \$500,000 or more reflected on the December 15, 2009 Project/Program List and eliminated in the Company's 2012 annual capital budgets. Supporting explanations, in the form of appended white papers, are provided for projects and/or programs of \$500,000 or more not reflected on the December 15, 2009 Project/Program List and added in the Company's 2012 annual capital budgets.

<sup>3</sup> Addresses projects and programs that the Company forecasts an aggregate dollar amount to complete a certain number of units, where the Company spent within ten (15) percent of the forecasted amount for projects or programs with a forecasted cost greater than \$5 million but less than \$25 million, or within fifteen (10) percent of the forecasted amount for projects or programs with a forecasted cost of \$25 million or more, but completed more or less units than projected, resulting in the unit cost variance of greater than fifteen (15) percent; the actual number of units completed as compared to the forecasted level are provided.

**Summary T&D Capital Plan**  
**2012 Capital Budget and Actual Spend**  
(\$'s thousands)

2012					
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
<b>Electric T&amp;D</b>					
System & Transmission	64,330	40,500	59,073	18,573	46%
Substations	212,670	201,994	141,090	(60,904)	-30%
Distribution	893,157	867,719	876,074	8,355	1%
Sub-total Electric T&D	1,170,157	1,110,213	1,076,237	(33,976)	-3%
Electric Interference	38,000	40,617	42,045	1,428	4%
Water Tunnel & Stimulus Projects	-	18,725	35,247	16,522	88%
<b>Total Electric T&amp;D</b>	<b>1,208,157</b>	<b>1,169,555</b>	<b>1,153,529</b>	<b>(16,026)</b>	<b>-1%</b>
<b>Electric Production</b>	<b>39,300</b>	<b>35,840</b>	<b>32,359</b>	<b>(3,481)</b>	<b>-10%</b>
<b>Shared Services</b>					
Facilities	44,785	60,250	42,336	(17,914)	-30%
IT Initiatives	24,795	39,075	42,173	3,098	8%
General Equipment	76,451	53,977	58,799	4,822	9%
Other	3,740	35,204	27,482	(7,721)	-22%
<b>Total Shared Services</b>	<b>149,771</b>	<b>188,504</b>	<b>170,789</b>	<b>(17,715)</b>	<b>-9%</b>
Sub-total Capital	1,397,228	1,393,900	1,356,677	(37,222)	-3%
<b>New Financial &amp; Supply Chain System</b>	<b>20,500</b>	<b>39,800</b>	<b>37,276</b>	<b>(2,524)</b>	<b>-6%</b>
<b>Total Capital Expenditures</b>	<b>1,417,728</b>	<b>1,433,700</b>	<b>1,393,953</b>	<b>(39,746)</b>	<b>-3%</b>

*Note: 2012 Rate Plan for Electric IT (\$30,157) moved from Shared Services to Electric Distribution*

**System & Transmission Operations  
2012 Capital Budget and Actual Spend  
(\$'s Thousands)**

PROJECT NUMBER	BUDGET REF	LOCATION	DESCRIPTION	2012				
				Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
<b>ETR03 - SYS OPS - WORK MGMT SYSTEMS</b>								
PET1001	2ET9801	ECC	DISTRIBUTION ORDERS ENHANCEMENTS	350	350	252	(98)	-28%
<b>TOTAL - ETR03 - SYS OPS - WORK MGMT SYSTEMS</b>				<b>350</b>	<b>350</b>	<b>252</b>	<b>(98)</b>	<b>-28%</b>
<b>ETR04 - SYS OPS - CONTINUANCE</b>								
60003-STO	FET7001	ECC	EMS RELIABILITY AECC AND ECC	500	2,500	2,144	(356)	-14%
		ECC	OTHER	-	-	5	5	0%
<b>TOTAL - ETR04 - SYS OPS - CONTINUANCE</b>				<b>500</b>	<b>2,500</b>	<b>2,149</b>	<b>(351)</b>	<b>0%</b>
<b>ETR05 - SYS OPS - OPERATIONS REQUIREMENTS</b>								
-	4ET9704	ECC	CYBER SECURITY	300	300	378	78	26%
		ECC	INTERFACE WITH NYISO	100	-	-	-	0%
		ECC	CNS REPLACEMENT	-	-	4	4	0%
-	1ET9705	ECC	PLANT INFORMATION SYSTEM	200	200	119	(81)	-41%
-	9ET9708	ECC	OPERATIONS NETWORK FOR EMS	200	200	196	(4)	-2%
-	1ET0900	ECC	DISTRICT OPERATOR DIRECT - SYSTEM REPLACEMENT	1,450	1,900	1,231	(669)	-35%
<b>TOTAL - ETR05 - SYS OPS - OPERATIONS REQUIREMENTS</b>				<b>2,250</b>	<b>2,600</b>	<b>1,928</b>	<b>(672)</b>	<b>-26%</b>
<b>ETR06 - SYS OPS - DISTRICT OPERATIONS IMPROVEMENT</b>								
PET9009	1ET9808	ECC	SYSTEM OPERATION ENHANCEMENTS	300	300	262	(38)	-13%
-	3ET9805	ECC	DISTRICT OPERATOR TASK MANAGING SYSTEM	300	300	214	(86)	-29%
2006SO19	FET7003	ECC	OPERATION MANAGEMENT SYSTEM ENHANCEMENTS	800	400	296	(104)	-26%
<b>TOTAL - ETR06 - SYS OPS - DISTRICT OPERATIONS IMPROVEMENT</b>				<b>1,400</b>	<b>1,000</b>	<b>772</b>	<b>(228)</b>	<b>-23%</b>
<b>ETR08 - SYS OPS - FACILITIES/UTILITIES IMPROVEMENT</b>								
		ECC	ECC UPS BATTERY REPLACEMENT	500	500	-	(500)	-100%
-	-	ECC	COMPUTER ROOM RENOVATION	1,000	-	-	-	0%
<b>TOTAL - ETR15 - SYS OPS - ALTERNATE ENERGY CONTROL CENTER</b>				<b>1,500</b>	<b>500</b>	<b>34</b>	<b>(466)</b>	<b>-93%</b>
<b>ETR02 - SYS OPS - NEW EMS</b>								
-	6ET9801	ECC	ESTABLISH NEW ALTERNATE ENERGY CONTROL CENTER	-	-	1	1	-
<b>TOTAL - ETR15 - SYS OPS - ALTERNATE ENERGY CONTROL CENTER</b>				<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>0%</b>
<b>System Operations Total</b>				<b>6,000</b>	<b>6,950</b>	<b>5,143</b>	<b>(1,807)</b>	<b>-26%</b>
<b>ETR09 - TRANS OPS - FAILURES</b>								
-	6ET0700	VARIOUS	TRANSMISSION FEEDER FAILURES	5,300	5,300	11,798	6,498	123%
<b>TOTAL - ETR09 - TRANS OPS - FAILURES</b>				<b>5,300</b>	<b>5,300</b>	<b>11,798</b>	<b>6,498</b>	<b>123%</b>
<b>ETR10 - TRANS OPS - LOAD RELIEF</b>								
		VARIOUS	RE-CONDUCTOR FEEDERS 45 AND 46	10,800	-	-	-	0%
-	-	VARIOUS	DYNAMIC FEEDER RATING PROGRAM	1,100	4,500	752	(3,748)	-83%
			M29	-	-	1,413	1,413	0%

**System & Transmission Operations  
2012 Capital Budget and Actual Spend  
(\$'s Thousands)**

PROJECT NUMBER	BUDGET REF	LOCATION	DESCRIPTION	2012				
				Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
22208-06	8ET9802	VERNON - W49TH ST	38M72 UPGRADE	3,700	3,300	4,847	1,547	47%
<b>TOTAL - ETR10 - TRANS OPS - LOAD RELIEF</b>				<b>15,600</b>	<b>7,800</b>	<b>7,012</b>	<b>(788)</b>	<b>-10%</b>
<b>ETR11 - TRANS OPS - ENVIRONMENTAL</b>								
-	-	VARIOUS	ENVIRONMENTAL ENHANCEMENTS	850	900	2,071	1,171	130%
<b>TOTAL - ETR11 - TRANS OPS - ENVIRONMENTAL</b>				<b>850</b>	<b>5,900</b>	<b>7,664</b>	<b>1,764</b>	<b>30%</b>
<b>ETR12 - TRANS OPS - RELIABILITY &amp; FDR REPLACEMENT</b>								
20895-03	8ET9804	HUDSON RIVER TOWER	REINFORCE HUDSON RIVER CROSSING TOWERS	-	850	1,169	319	38%
22592-07	8ET9805	VARIOUS	RE-CONDUCTOR DUNWOODIE – SPRAIN BROOK TRANSMISSION CORRIDOR	5,680	-	-	-	0%
-	5ET1000	VARIOUS	EMERGENT TRANSMISSION RELIABILITY	11,000	11,000	2,850	(8,150)	-74%
			ASTORIA INTERCONNECT FOR FEEDER 34091	-	-	21,684	21,684	0%
-	-	STATEN ISLAND	FEEDERS 38R51 and 38R52	13,800	-	-	-	0%
		MANHATTAN	REPLACE 69KV FEEDERS ON QBB	3,400	-	-	-	0%
<b>TOTAL - ETR12 - TRANS OPS - RELIABILITY &amp; FDR REPLACEMENT</b>				<b>33,880</b>	<b>11,850</b>	<b>25,703</b>	<b>13,853</b>	<b>117%</b>
<b>ETR14 - TRANS OPS - OTHER</b>								
21598-05	7ET0800	-	UPGRADE OVERHEAD 345KV TRANSMISSION STRUCTURES	2,700	2,700	1,753	(947)	-35%
<b>TOTAL - ETR14 - TRANS OPS - OTHER</b>				<b>2,700</b>	<b>2,700</b>	<b>1,753</b>	<b>(947)</b>	<b>-35%</b>
<b>Total Transmission Operations</b>				<b>58,330</b>	<b>33,550</b>	<b>53,930</b>	<b>20,380</b>	<b>61%</b>
<b>TOTAL - SYSTEM &amp; TRANSMISSION OPERATIONS</b>				<b>64,330</b>	<b>40,500</b>	<b>59,073</b>	<b>18,573</b>	<b>46%</b>

**Substation Operations**  
**2012 Capital Budget and Actual Spend**  
(\$'s Thousands)

DESCRIPTION	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
SMALL CAPITAL EQUIPMENT PROGRAM	2,670	2,670	4,567	1,897	71%
<b>TOTAL - SMALL CAPITAL</b>	<b>2,670</b>	<b>2,670</b>	<b>4,567</b>	<b>1,897</b>	<b>71%</b>
SECURITY ENHANCEMENTS	6,500	9,000	5,966	(3,034)	-34%
<b>TOTAL - SECURITY</b>	<b>6,500</b>	<b>9,000</b>	<b>5,966</b>	<b>(3,034)</b>	<b>-34%</b>
CHARGES TO COMPLETED PROJECTS - LOAD RELIEF	-	-	1,920	1,920	
DEFERRED PROJECT	-	-	327	327	
EAST 179TH STREET: SWITCHGEAR & BUS REPLACEMENT	19,500	15,000	11,105	(3,895)	-26%
EMERGENT LOAD RELIEF	1,400	1,924	1,214	(710)	-37%
FRESH KILLS: REPLACE LIMITING FEEDERS ASSOCIATED W/ TR 21W	-	1,000	-	(1,000)	-100%
GREENWOOD: REPLACE OVERDUTIED EQUIPMENT	-	4,000	524	(3,476)	-87%
<b>TOTAL - LOAD RELIEF</b>	<b>20,900</b>	<b>21,924</b>	<b>15,090</b>	<b>(6,834)</b>	<b>-31%</b>
138KV CIRCUIT BREAKER CAPITAL UPGRADE PROGRAM	9,000	6,000	3,340	(2,660)	-44%
345KV CIRCUIT BREAKER CAPITAL UPGRADE PROGRAM	5,200	4,000	1,847	(2,153)	-54%
ADDITIONAL G&T DEVICES	300	-	-	-	
AREA SUBSTATION RELIABILITY AND AUTO GROUND CIRCUIT SWITCHERS	10,000	10,500	12,582	2,082	20%
CAPACITOR CABLE UPGRADE	2,000	-	185	185	
CATEGORY ALARMS PROGRAM	3,000	2,500	1,342	(1,158)	-46%
CHARGES TO COMPLETED PROJECTS - RELIABILITY	-	-	164	164	
CONDITION BASED MONITORING EQUIPMENT	300	300	163	(137)	-46%
CONSTRUCT RELAY ENCLOSURE HOUSES	-	500	37	(463)	-93%
CONTROL CABLE UPGRADE PROGRAM	1,200	1,000	525	(475)	-48%
CORONA: STABILIZATION OF POTHEAD STAND SUPPORTS	-	1,000	369	(631)	-63%
DC SYSTEM UPGRADE PROGRAM	4,200	3,000	907	(2,093)	-70%
DISCONNECT SWITCH CAPITAL UPGRADE PROGRAM	4,600	3,000	1,283	(1,717)	-57%
DISTURBANCE MONITORING EQUIPMENT PROGRAM	-	8,000	2,963	(5,037)	-63%
EAST 13TH STREET: ALARM PANEL REPLACEMENTS & CONTROL SYSTEMS ENHANCEMENTS	5,500	2,000	-	(2,000)	-100%
EAST RIVER UPGRADE	4,500	2,500	4,749	2,249	90%
ELMSFORD: UPGRADE OF #2 STATION	3,000	4,400	2,832	(1,568)	-36%
FACILITY IMPROVEMENT PROGRAM	6,600	6,600	5,017	(1,583)	-24%
FIRE SUPPRESSION SYSTEM UPGRADES	6,500	9,000	7,506	(1,494)	-17%
GIC MONITORING EQUIPMENT	-	-	1,121	1,121	
HIGH VOLTAGE TEST SETS	3,000	3,000	1,228	(1,772)	-59%
HUDSON AVENUE: L&P TRANSFORMER	-	-	-	-	
JAMAICA: INSTALL SWITCHGEAR FALL PROTECTION	-	1,000	-	(1,000)	-100%
REINFORCED GROUND GRID	800	800	1,039	239	30%
RELAY MODIFICATIONS PROGRAM	6,500	8,000	6,840	(1,160)	-15%
RELAY PROTECTION SYSTEM REDUNDANCY - SINGLE POINT OF CONTACT	26,600	3,000	-	(3,000)	-100%
RETROFIT OVERDUTIED 13/27KV CIRCUIT BREAKER PROGRAMS	11,500	10,500	4,565	(5,935)	-57%
ROOF REPLACEMENT PROGRAM	1,800	1,800	1,704	(96)	-5%
SWITCHGEAR ENCLOSURE UPGRADE PROGRAM	-	1,000	253	(747)	-75%
SUBSTATION AUTOMATION TARGET INFORMATION SYSTEM	1,800	-	-	-	
TRANSFORMER REPLACEMENT PROGRAM	24,000	24,000	13,834	(10,166)	-42%
<b>TOTAL - RELIABILITY</b>	<b>141,900</b>	<b>117,400</b>	<b>76,395</b>	<b>(41,005)</b>	<b>-35%</b>
EH&S RISK MITIGATION	3,800	10,000	16,826	6,826	68%
PUMPING PLANT IMPROVEMENT PROGRAM	6,500	6,500	4,748	(1,752)	-27%
PURS SUPERVISORY CONTROL & DATA ACQUISITION	3,200	2,500	765	(1,735)	-69%
<b>TOTAL - ENVIRONMENTAL</b>	<b>13,500</b>	<b>19,000</b>	<b>22,339</b>	<b>3,339</b>	<b>18%</b>
BUCHANAN WOOD POLE BYPASS (MAKE PERMANENT)	-	-	-	-	

**Substation Operations**  
**2012 Capital Budget and Actual Spend**  
(\$'s Thousands)

DESCRIPTION	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
FAILED EQUIPMENT OTHER THAN TRANSFORMERS PROGRAM	2,000	5,000	5,923	923	18%
FAILED TRANSFORMER PROGRAM	24,000	24,000	8,408	(15,592)	-65%
<b>TOTAL - FAILURES</b>	<b>26,000</b>	<b>29,000</b>	<b>14,331</b>	<b>(14,669)</b>	<b>-51%</b>
CIRCUIT SWITCHER REPLACEMENT PROGRAM	-	1,000	-	(1,000)	-100%
SOCES RTU REPLACEMENT	600	1,000	239	(761)	-76%
TECHNOLOGY IMPROVEMENTS	600	1,000	214	(786)	-79%
<b>TOTAL - OTHER</b>	<b>1,200</b>	<b>3,000</b>	<b>453</b>	<b>(2,547)</b>	<b>-85%</b>
CHARGES TO COMPLETED PROJECTS - GENERATION INTERCONNECTION		-	-	-	
GOETHALS: SUBSTATION RECONFIGURATION (LINDEN VFT)	-	-	1,949	1,949	
<b>TOTAL - GENERATION INTERCONNECTION</b>	<b>-</b>	<b>-</b>	<b>1,949</b>	<b>1,949</b>	
<b>TOTAL - SUBSTATION OPERATIONS</b>	<b>212,670</b>	<b>201,994</b>	<b>141,090</b>	<b>(60,904)</b>	<b>-30%</b>

**Electric Operations**  
**2012 Capital Budget and Actual Spend**  
(\$'s Thousands)

Description	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
<b>New Business</b>					
New Business Capital	157,000	154,714	154,296	(418)	0%
Meter Installation	18,271	17,363	14,092	(3,271)	-19%
<b>Total</b>	<b>\$ 175,271</b>	<b>\$ 172,078</b>	<b>\$ 168,388</b>	<b>\$ (3,690)</b>	<b>-2%</b>
<b>Emergency Response - Emergency Replacement</b>					
Primary Cable Replacement (OA's)	61,056	59,275	62,443	3,168	5%
Overhead	18,267	18,190	62,804	44,614	245%
Temporary Services (incl. conduit)	21,053	33,645	34,161	516	2%
Street Lights (incl. conduit)	20,935	24,651	23,742	(909)	-4%
Transformer Installation	27,146	24,613	60,305	35,692	145%
<b>Total</b>	<b>\$ 148,457</b>	<b>\$ 160,374</b>	<b>\$ 243,455</b>	<b>\$ 83,081</b>	<b>52%</b>
<b>System Reinforcement</b>					
Area SS Overloads					
Elmsford Refurbishment 2008	2,000	2,001	558	(1,443)	-72%
Penn/Waterside	900	-	-	-	
Cable Crossing (XW Riverdale & BQ Flushing)	6,000	4,995	2,259	(2,736)	-55%
59th Street Bridge Crossing	2,000	1,000	0	(1,000)	-100%
Other Misc Small Transfer Projects	-	250	490	240	96%
<b>Total</b>	<b>\$ 10,900</b>	<b>\$ 8,246</b>	<b>\$ 3,307</b>	<b>\$ (4,939)</b>	<b>-60%</b>
<b>Base Growth / Relief</b>					
Primary Feeder Relief	22,583	8,918	7,915	(1,003)	-11%
Network/Non Network Transformers Relief	36,120	30,939	27,029	(3,910)	-13%
NonNetwork Fdr Relief (Open Wire)	11,105	6,898	6,865	(33)	0%
Overhead Transformer Relief	1,642	945	4,504	3,559	
<b>Total</b>	<b>\$ 71,450</b>	<b>\$ 47,700</b>	<b>\$ 47,079</b>	<b>\$ (621)</b>	<b>-1%</b>
<b>Reliability</b>					
Osiose (C Truss)	1,500	2,115	819	(1,296)	-61%
Autoloop Reliability (27kV Inc'l.)	3,859	3,671	977	(2,694)	-73%
Aerial Cable Replacement	1,009	1,160	162	(998)	-86%
#4,#6 Self Supporting Wire	1,669	1,469	995	(474)	-32%
Automated Emergency Ties	750	756	-	(756)	-100%
OH Feeder Sectionalizing	750	-	30	30	
Rear-Lot Pole Elimination	1,437	-	-	-	
Overhead Conductor Clearance	1,130	498	61	(437)	-88%
Overhead Feeder Reliability/VRS Replacement	2,000	1,108	1,914	806	73%
Additional 13 kV Feeder Sectionalizing	-	384	(17)	(401)	-104%
Oil Minders	600	520	1,294	774	149%
Secondary Open Mains	155,211	144,746	122,215	(22,531)	-16%
HiPot	2,400	3,144	5,032	1,888	60%
PILC	20,085	20,971	16,161	(4,810)	-23%
Vented Service Box Covers	10,000	11,697	8,041	(3,656)	-31%
4 kV UG Reliability	1,111	2,074	726	(1,348)	-65%
Underground Secondary Reliability Program	44,422	30,491	41,708	11,217	37%
Overhead Secondary Reliability Program	2,500	206	332	126	61%
Remote Monitoring System 3rd Generation Transmitter Upgrade	7,850	5,447	2,199	(3,248)	-60%
Pressure, Temperature and Oil Sensors	2,559	1,895	715	(1,180)	-62%
Sectionalizing Switches	4,466	2,834	27	(2,807)	-99%
Grounding transformers	550	630	275	(355)	-56%
Shunt reactors	1,761	1,573	1,416	(157)	-10%
Coastal Storm Risk Mitigation	3,000	-	1	1	
Targeted Primary DBC Replacement	-	524	101	(423)	-81%
<b>Network Reliability</b>	<b>23,323</b>	<b>30,425</b>	<b>18,735</b>	<b>(11,690)</b>	<b>-38%</b>

**Electric Operations**  
**2012 Capital Budget and Actual Spend**  
(\$'s Thousands)

Description	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
URD Cable Rejuvenation/Fault Indicator	368	315	68	(247)	-78%
ATS Installation USS Reliability XW	2,450	210	240	30	14%
Transformer Vault Moderization	-	4,947	4,355	(592)	-12%
Street Lights Service Reliability Program	4,809	3,600	444	(3,156)	-88%
	<b>\$ 301,569</b>	<b>\$ 277,409</b>	<b>\$ 230,949</b>	<b>\$ (46,460)</b>	<b>-17%</b>
<b>System Reinforcement IT</b>					
Secondary Visualization Model	1,160	1,160	816	(344)	-30%
Secondary Monitoring (Secondary Model Validation)	4,000	-	-	-	
Joint Pole Use Software	-	2,315	865	(1,450)	-63%
Heads Up Display	500	500	513	13	3%
Engineering Dashboard	-	675	112	(563)	-83%
Enhanced Customer Communication Storm Outage Mgmt System	1,800	1,800	2,280	480	27%
RMS Data Acquisition System	500	2,380	1,365	(1,015)	-43%
Energy Services Case Management	3,000	4,000	7,386	3,386	85%
Power Quality (PQ) System Upgrade	-	1,559	180	(1,379)	-88%
SCADA Systems Consolidation	100	1,000	17	(983)	-98%
Electric Distribution Control Center Upgrades	3,000	3,000	1,898	(1,102)	-37%
Mapping System Upgrades	500	500	99	(401)	-80%
Electronic Distribution Feeder Sign On	-	1,149	579	(570)	-50%
Decision Aids - Decision Optimizer - Contingency Analysis Program	-	250	104	(146)	-58%
High Tension Monitoring Data Acquisition System (HTMDAS)	730	730	-	(730)	-100%
Energy Efficiency Information System	-	400	212	(188)	-47%
Area Profile System	-	401	193	(208)	-52%
SCN Replacement Project	-	1,000	34	(966)	-97%
PQView System Upgrade	-	650	-	(650)	-100%
System Enhancements to Support Conservation Voltage	-	500	-	(500)	-100%
Misc. Small IT Projects	708	-	65	65	
<b>Total</b>	<b>\$ 15,998</b>	<b>\$ 23,969</b>	<b>\$ 16,792</b>	<b>\$ (7,177)</b>	<b>-30%</b>
<b>Work Management System</b>	<b>\$ 20,027</b>	<b>\$ 39,800</b>	<b>\$ 24,612</b>	<b>(15,188)</b>	<b>-38%</b>
<b>Total System Reinforcement</b>	<b>\$ 419,944</b>	<b>\$ 397,124</b>	<b>\$ 322,739</b>	<b>\$ (74,385)</b>	<b>-19%</b>
Emergency Response - Emergency Repairs	148,457	160,374	243,455	83,081	52%
System Relief and Reliability	419,944	397,124	322,739	(74,385)	-19%
New Business	157,000	154,714	154,296	(418)	0%
Meter Installation	18,271	17,363	14,092	(3,271)	-19%
<b>Meter Purchase</b>	<b>9,552</b>	<b>9,551</b>	<b>11,170</b>	<b>1,619</b>	<b>17%</b>
Transformer Purchase	135,106	125,000	126,942	1,942	2%
Sub-Total	\$ 888,330	\$ 864,127	\$ 872,694	8,567	1%
<b>Distribution Substation</b>					
Unit Substation Load Relief	1,375	-	-	-	
MODERNIZATION & OTHER	3,452	3,592	3,380	(212)	-6%
<b>Total</b>	<b>\$ 4,827</b>	<b>\$ 3,592</b>	<b>\$ 3,380</b>	<b>\$ (212)</b>	<b>-6%</b>
<b>Total Distribution</b>	<b>\$ 893,157</b>	<b>\$ 867,719</b>	<b>\$ 876,074</b>	<b>\$ 8,355</b>	<b>1%</b>

**Shared Services Capital Plan**  
**2012 Capital Budget and Actual Spend**  
(\$ thousands)

	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
<b>Facilities</b>					
Irving Place Re-Stacking	22,000	24,992	18,093	(6,899)	-28%
Astoria Dock A11 & A12	3,500	4,002	1,029	(2,973)	-74%
Astoria Outfall B (Consent Order)	-	9,476	400	(9,076)	-96%
Construction Relocation Buildout for Queens Blvd, Farrington and Gowanus	-	2,000	2,470	470	24%
All Other- Building & Yards	19,285	19,780	20,344	564	3%
<b>Total Facility</b>	<b>\$ 44,785</b>	<b>\$ 60,250</b>	<b>\$ 42,336</b>	<b>\$ (17,914)</b>	<b>-30%</b>
<b>Strategic IT Projects</b>					
Integrated GIS Solutions Phase 0 Assessment [Mapping Systems Replacement]	-	-	1,094	1,094	100%
PowerPlan Provision System Implementation Phase II	-	-	803	803	100%
Allocation (ALLOC) Mainframe Replacement	-	400	262	(138)	-34%
XBRL Reporting System	-	250	-	(250)	-100%
Gas Rate Design and Analysis Systems	-	582	625	43	7%
Repair Tax Allowance	-	510	588	78	15%
Contact and Investigation Tracking System	-	52	165	113	218%
Case Management System - Law	-	-	392	392	100%
Logistic Management System - Emergency Operations - CFS	275	275	235	(40)	-14%
Scada Net - IR	1,370	1,652	1,591	(61)	-4%
Icon Radios	500	1,341	1,424	83	6%
CCTN Facilities Improvements	-	561	615	54	10%
CCTN Modernization - Sonet Conversion	-	338	366	28	8%
CCTN Expansion Buchanan	-	507	522	15	3%
CCTN Expansion - Fiber Projects	515	1,382	1,489	107	8%
CCTN Expansion - Mobile WiMAX Access Network	-	459	940	481	105%
CCTN Modernization - Mapping System	-	506	-	(506)	-100%
Server Farm Facility Enhancements (Worth St.)	1,750	5,870	1,189	(4,681)	-80%
Cyber Security - IR	-	1,463	1,341	(122)	-8%
Collaboration Tools	-	500	493	(7)	-1%
Desktop Infrastructure	-	1,000	1,023	23	2%
Business Systems Sustainability - Upgrade Applications to SQL Server 2008	-	570	646	77	13%
Business Systems Sustainability - Upgrade Applications to Windows 7	-	570	625	56	10%
New Technology	-	500	524	24	5%
Computer and Communications Accounting System	-	113	93	(20)	-18%
Install Communication Hut To Support Cctn, Verizon And Lan Facilitie	-	1,522	2,027	505	33%
Enterprise Software & Collaboration	1,216	-	-	-	
Data Warehousing & Business Intelligence- IR	1,800	-	-	-	
Identity Management	550	-	-	-	
TEMS Enhancements	142	-	-	-	
User Technology Plan	240	-	-	-	
Replacement of Unsupported Technologies	911	-	-	-	
Warehouse Management System Upgrade - CFS	275	-	-	-	
Gas Accounting Automation (IGS)	-	400	440	40	10%
Henwood Upgrade and Replacement Phase 0	-	1,000	2,219	1,219	122%
TLC Infrastructure Upgrades - HR	600	-	17	17	100%
eLearning - HR	1,000	-	333	333	100%
HR PeopleSoft Upgrade	-	832	31	(801)	-96%
Transmission Owner Data Reporting System (TODRS) [NYISO billing system]	525	1,000	240	(760)	-76%
GridOps Load Forecasting Enhancements	-	750	728	(22)	-3%
Total Rewards Programming Project	-	-	632	632	100%
Management Work Flow Records Retention Law Dept.	1,300	-	-	-	
Install Public Improvement System	350	-	163	163	
Metaphase Replacement [Enterprise Document Management System]	250	250	533	283	113%
Wiring Access Raceway System (WARS)	-	154	4	(150)	-97%
Engineering Drawing (AutoCad)	750	596	459	(137)	-23%
Construction Survey Mapping Repository	-	700	855	155	22%
Upgrade and Enhance Contractor Oversight System	-	580	571	(9)	-2%
Construction Mobile Office	350	350	334	(16)	-4%

**Shared Services Capital Plan**  
**2012 Capital Budget and Actual Spend**  
(\$ thousands)

	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
Misc IT CEES integration Bid Check Estimate, Appropriations	-	300	74	(226)	-75%
Misc IT Work Coordination Street Activity	-	250	340	90	36%
Misc IT Work Coordination Street Activity		45	330	285	633%
Mobile Field Device	-	-	334	334	100%
Needs Immediate Corrective Action (NICA)	-	-	326	326	100%
Metaphase Replacement - Phase 2 (Project Explorer)	-	-	263	263	100%
Meter Data Mangement System (MDMS) Expansion	-	200	239	39	19%
IVR Self-Service (includes Virtual Hold)	2,160	1,975	638	(1,337)	-68%
Replace Rockwell ACD Switch	1,080	1,115	3,384	2,269	204%
Replace CSS Workstations	1,425	1,100	953	(147)	-13%
Business Continuity (Disaster Recovery)	-	-	234	234	100%
Off System Billing (Satellite Billing)	1,570	1,900	1,975	74	4%
CSS Life Extension Phase III	1,100	1,199	1,092	(108)	-9%
Cycle Data Warehouse	50	50	51	1	1%
Itron/Cycle Meter Reading System	-	1,701	1,864	163	10%
Steam Billing System	-	325	1,059	734	226%
On Bill Financing	-	1,000	917	(83)	-8%
Bronx Customer Walk-in Center	-	-	255	255	100%
IRIS Handheld Devices	-	-	1,014	1,014	100%
All Other	2,741	381	202	(179)	-47%
<b>Total Strategic IT Projects</b>	<b>\$ 24,795</b>	<b>\$ 39,075</b>	<b>\$ 42,173</b>	<b>\$ 3,098</b>	<b>8%</b>
<b>Other</b>					
Reactive Power	2,300	5,000	3,116	(1,884)	-38%
Facility Flush Improvements	-	14,003	7,190	(6,813)	-49%
AMR - Strategic/ Hard To Read	1,125	1,201	1,347	147	12%
AMR - Bronx Saturation	-	15,000	15,829	829	6%
AMR New Meter Purchases	315	-	-	-	
<b>Total Other</b>	<b>\$ 3,740</b>	<b>\$ 35,204</b>	<b>\$ 27,482</b>	<b>\$ (7,721)</b>	<b>-22%</b>
<b>General Equipment</b>					
XM1 - Furniture, Partitions	1,897	816	652	(164)	-20%
XM2/13 - Vehicles	34,982	31,000	32,917	1,917	6%
XM3 - Stores Equipment	1,075	209	66	(143)	-68%
XM4 - Shop Equipment	178	219	143	(76)	-35%
XM5/15 - Lab & Test Equipment	5,539	4,775	2,935	(1,840)	-39%
XM6 - Tools	6,733	4,730	3,337	(1,393)	-29%
XM7 - Miscellaneous (AC's, VCR's, etc.)	2,174	630	1,329	699	111%
XM8 - Telecommunications	3,885	2,952	2,827	(125)	-4%
XM10 - Computers	19,988	8,646	14,593	5,947	69%
<b>Total General Equipment</b>	<b>\$ 76,451</b>	<b>\$ 53,977</b>	<b>\$ 58,799</b>	<b>\$ 4,822</b>	<b>9%</b>
<b>Total CECONY Common Capital</b>	<b>\$ 149,771</b>	<b>\$ 188,504</b>	<b>\$ 170,789</b>	<b>\$ (17,715)</b>	<b>-9%</b>

**Electric Production**  
**2012 Capital Budget and Actual Spend**  
**(\$'s Thousands)**

	2012				
	Rate Plan	Budget	Actual	Variation Between Budget and Actual	Variation %
EH&S	3,790	21,535	20,787	(748)	-3%
Control Systems	1,790	1,610	2,703	1,093	68%
Boilers	-	4,470	5,271	801	18%
Mechanical Equipment Replacement	3,870	1,110	691	(419)	-38%
<b>Electrical Equipment</b>	<b>25,850</b>	<b>7,115</b>	<b>1,548</b>	<b>(5,567)</b>	<b>-78%</b>
Waterfront	4,000	-	-	-	
<b>Total Electric Production</b>	<b>39,300</b>	<b>35,840</b>	<b>32,359</b>	<b>(3,481)</b>	<b>-10%</b>

## Capital Budget vs. Actual Variation Explanations

	\$ Thousands		Variation (%)	Explanation
	2012 Budget	2012 Actual		
<b>S&amp;TO</b>				
Transmission Feeder Failures	5,300	11,798	123%	Expenditures related to failures on Feeders 38B11 and 15055.
Emergent Transmission Reliability	11,000	2,850	-74%	The variation is due to the reallocation of funds to support the Astoria Annex project

### Substation Operations

Security Enhancements	\$ 9,000	\$ 5,892	-35%	Later starts than originally forecasted -- Farragut: resources re-directed due to PAR failure; Fresh Kills: delay in receiving drawings (civil package); Gowanus: delay due to BEC Interconnection work; offset by Pleasant Valley & Eastview: slippage of originally planned 2011 work into 2012.
East 179th Street: Switchgear & Bus Replacement	\$ 15,000	\$ 11,105	-26%	Later procurement of Switchgear and Bus than originally forecasted.
138kV Circuit Breaker Capital Upgrade Program	\$ 6,000	\$ 3,340	-44%	Outage dependant. Five completed, the sixth scheduled for the Fall was cancelled, due to Super Storm Sandy.
Area Substation Reliability and Auto Ground Circuit Switchers	\$ 10,500	\$ 12,582	20%	Slippage of originally planned 2011 work into 2012 (Washington, Cedar Street DTT installations); East 40th Street - Circuit Switchers; work for first tie-in outage at Leonard Street DTT; and work at Sherman Creek and Harrison.
Disturbance Monitoring Equipment Program	\$ 8,000	\$ 2,963	-63%	Later starts than originally forecasted.
East 13th Street: Alarm Panel Replacements & Control Systems Enhancements	\$ 5,500	\$ -	-100%	Scope of work reduced in 2011; re-reviewed in 2012. Now to be included in overall Storm Hardening initiative.
Facility Improvement Program	\$ 6,600	\$ 5,017	-24%	Later starts than originally forecasted.
Fire Suppression System Upgrades	\$ 9,000	\$ 7,506	-17%	Later start than originally forecasted for the FM-200 System (due to late issuance of Purchase Order), Fire Pump Test Connections and Dunwoodie Fire Pump House (extension of bid due date).
Relay Modifications Program	\$ 8,000	\$ 6,840	-15%	Later starts than originally forecasted (allocation of crews to higher priority work earlier in the year), coupled with the reallocation of forces and cancellation of outage in November due to Super Storm Sandy.
Retrofit Overduty 13/27kV Circuit Breaker Programs	\$ 10,500	\$ 4,565	-57%	Outage dependent: West 65th Street - outage cancelled due to system conditions; Jamaica and Bensonhurst #1: Outages cancelled (Jamaica, by Engineering and Bensonhurst by System), offset by earlier than forecasted payment of breakers and testing for West 110th Street. Later issuance of PO for purchase of breakers for East 63rd Street than originally forecasted.
Transformer Replacement Program	\$ 24,000	\$ 13,834	-42%	Later than originally forecasted progress payments for replacement Transformers (issuance of PO), coupled with later progress payment for Dunwoodie PAR S1/S2 than originally forecasted and later start on Dunwoodie N1 Moat & Pad work.
EH&S Risk Mitigation	\$ 10,000	\$ 16,826	68%	Acceleration of work at Dunwoodie and Cedar Street OWS and Millwood MOV for Detection Tank.
Pumping Plant Improvement Program	\$ 6,500	\$ 4,748	-27%	Farragut: Later start due to permitting issues, receipt of drawings and delay in bid check process than originally forecasted; Corona PP#1 : Later start due to later release of Civil Drawings (Backpressure Cabinet installation), offset by earlier than originally forecasted progress payment for East 13th Street Pumping Plant improvements.
Failed Equipment Other Than Transformers Program	\$ 5,000	\$ 5,923	18%	Higher level of equipment failures than originally forecasted (Farragut Shunt Reactor R12 and Farragut PAR #11 Surge Arrestors).
Failed Transformer Program	\$ 24,000	\$ 8,408	-65%	Lower level of failed transformers than originally forecasted.

### Electric Operations

Meter Installation	\$ 17,363	\$ 14,092	-19%	Under-run due to fewer meter replacements and upgrades associated with New Business.
Overhead	\$ 18,204	\$ 62,804	245%	Over-run due to costs related to Superstorm Sandy.
Transformer Installation	\$ 24,654	\$ 60,305	145%	Over-run due to costs related to Superstorm Sandy.
Network/Non Network Transformers Relief	\$ 30,939	\$ 27,029	-13%	Under-run due to advanced load relief and phase balancing jobs delayed due to Superstorm Sandy
Secondary Open Mains	\$ 144,746	\$ 122,215	-16%	Under-run due to engineering reprioritization and Superstorm Sandy constraints
HiPot	\$ 3,144	\$ 5,032	60%	Over run due to HIPOT spec change (Bulletin No. B-183), which now specifies that every feeder that comes out of service needs to be HIPOT tested.
PILC	\$ 20,971	\$ 16,161	-23%	Under-run is due to prioritization focusing on NRI networks and backbone feeders in BQ.
Vented Service Box Covers	\$ 11,697	\$ 8,041	-31%	Under-run due to work plan impacted by contingency of one month work stoppage as well as PO delays in prior months and delays from Superstorm Sandy.
Underground Secondary Reliability Program	\$ 30,491	\$ 41,708	37%	Over-run in Staten Island due to accelerated Port Richmond Project as well as advanced work in Manhattan.
Remote Monitoring System 3rd Generation Transmitter Upgrade	\$ 5,447	\$ 2,199	-60%	Under-run due to optimization for higher priority programs.
Network Reliability	\$ 30,425	\$ 18,735	-38%	Under-run due to projects to establish new feeders 6B60 & 1B73 being postponed to 2013 as a result of Superstorm Sandy.
Work Management System	\$ 39,800	\$ 24,612	-38%	Under-run mostly due to delays as a result of Superstorm Sandy and unused WMS contingency.
Meter Purchase	\$ 9,551	\$ 11,170	17%	Over-run mostly due to equipment purchases related to the impending IDEN communications network shut-down.

### Shared Services

## Capital Budget vs. Actual Variation Explanations

	<i>\$ Thousands</i>		<b>Variation</b>	<b>Explanation</b>
	<b>2012</b>	<b>2012</b>		
	<b>Budget</b>	<b>Actual</b>	<b>(%)</b>	
Irving Place Re-Stacking	\$ 24,992	\$ 18,093	-28%	Work was deferred due to labor contingency and superstorm Sandy.
Astoria Outfall B (Consent Order)	\$ 9,476	\$ 400	-96%	Work was deferred due to labor contingency and superstorm Sandy.
Server Farm Facility Enhancements (Worth St.)	\$ 5,870	\$ 1,189	-80%	This project was delayed to explore additional alternatives for the location of the facility.
Reactive Power	\$ 5,000	\$ 3,116	-38%	Lower than expected hours spent on communication equipment installation
Facility Flush Improvements	\$ 14,003	\$ 7,190	-49%	Project had a delayed start. Work has been shifted to 2013.
XM10 - Computers	\$ 8,646	\$ 14,593	69%	Additional funding of \$4.5m was obtained during the year to replace obsolete computer equipment and to purchase Oracle server licenses.

### **Electric Production**

Electrical Equipment	\$ 7,115	\$ 1,548	-78%	Delayed procurement of equipment and deferred outages for installation because of labor contingency and Superstorm Sandy.
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## Rate Plan vs. Capital Budget Explanations

S&TO	\$ Thousands			Explanation
	2012 Rate Plan	2012 Budget	2012 Actual	
Computer Room Renovation	\$ 1,000	\$ -	\$ -	Renovation of main computer room shifted outside of EMS upgrade window.
Reconductor Feeders 45 and 46	\$ 10,800	\$ -	\$ -	An alternative to the reconductoring of the feeder was performed which involved the installation of a forced cooling system.
M29	\$ -	\$ -	\$ 1,413	Carryover charges related to the fence and canopy installation at the Academy Substation.
Pipe Enhancement Program	\$ -	\$ 5,000	\$ 5,593	Project was initiated to address areas of corrosion on the pipe-type transmission feeder system based on leak history data and field observations. See white paper attached (pg. 1-4).
Reinforce Hudson River Tower Crossing Towers	\$ -	\$ 850	\$ 1,169	Work was deferred from 2011 due to low bid check estimate. Project was completed in 2012 by Company forces. See white paper attached (pg. 5-6).
Reconductor Dunwoodie Sprainbrook Transmission Corridor	\$ 5,680	\$ -	\$ -	Project was deferred until 2013.
Astoria Interconnect for Feeder 34091	\$ -	\$ -	\$ 21,684	Project was initiated to address a 200MW deficiency in the Astoria East / Corona load pocket and as such did not meet out N-1-1 operating criteria during the summer 2012 peak demand.
Feeders 38R51 and 38R52	\$ 13,800	\$ -	\$ -	Project was deferred due to high order of magnitude estimate.
Replace 69KV Feeders on QBB	\$ 3,400	\$ -	\$ -	Project was deferred to 2013 with a revised scope of work.
<b>Substation Operations</b>				
Charges to Completed Projects - Load Relief	\$ -	\$ -	\$ 1,920	Main driver is Woodrow - Install 3rd Transformer -- sidewalk/paving, inspection, Land survey and permit costs to obtain C of O.
Fresh Kills: Replace Limiting Feeders Associated W/TR 21W	\$ -	\$ 1,000	\$ -	Deferred to future year. Project deferred in 10-Year Load Relief Plan. See white paper attached (pg. 7-8).
Greenwood: Replace Overduty Equipment	\$ -	\$ 4,000	\$ 524	New project identified for 2012. See white paper attached (pg. 9-10).
Capacitor Cable Upgrade	\$ 2,000	\$ -	\$ 185	Deferred to future year. 2012 actuals are a result of slippage of originally planned 2011 work into 2012 (E. 75th Street Cap Bank C1 Supply Cable)
Construct Relay Enclosure Houses	\$ -	\$ 500	\$ 37	Continuation of program in 2012. Original 2012 scope was to address two enclosures. See white paper attached (pg. 11-13).
Corona: Stabilization of Pothead Stand Supports	\$ -	\$ 1,000	\$ 369	Continuation of Corona Settlement Program in 2012 due to program scope expansion to address continuing settlement issues. The 2012 scope covered the stabilization of Disconnect Switch foundations. See white paper attached (pg. 14-15).
Disturbance Monitoring Equipment Program	\$ -	\$ 8,000	\$ 2,963	New project identified for 2012. See white paper attached (pg. 16-17).
GIC Monitoring Equipment	\$ -	\$ -	\$ 1,121	New project identified in 2012. Work accelerated to enable installation before next maximum occurrence expected in May 2013. See white paper attached (pg. 18-19).
Jamaica: Install Switchgear Fall Protection	\$ -	\$ 1,000	\$ -	Deferred to future year. See white paper attached (pg. 20-22).
Switchgear Enclosure Upgrade Program	\$ -	\$ 1,000	\$ 253	Continuation of Switchgear Enclosure Upgrade Program. Two projects were originally planned for the Summer 2012. See white paper attached (pg. 23-24).
Substation Automation Target Information System	\$ 1,800	\$ -	\$ -	Deferred to future year.
Circuit Switcher Replacement Program	\$ -	\$ 1,000	\$ -	Deferred to future year. See white paper attached (pg. 25-26).
Gothals: Substation Reconfiguration (Linden VFT)	\$ -	\$ -	\$ 1,949	New project identified in 2012. See white paper attached (pg. 27-28).
<b>Electric Operations</b>				
Targeted Primary DBC Replacement	\$ -	\$ 524	\$ 101	See White Paper attached (pg. 29-30)
Transformer Vault Modernization	\$ -	\$ 4,947	\$ 4,355	See White Paper attached (pg. 31-34)
Joint Pole Use Software	\$ -	\$ 2,315	\$ 865	See White Paper attached (pg. 35-38)
Engineering Dashboard	\$ -	\$ 675	\$ 112	See White Paper attached (pg. 39-42)
Power Quality (PQ) System Upgrade	\$ -	\$ 1,559	\$ 180	See White Paper attached (pg. 43-46)
Electronic Distribution Feeder Sign On	\$ -	\$ 1,149	\$ 579	See White Paper attached (pg. 47-50)
SCN Replacement Project	\$ -	\$ 1,000	\$ 34	See White Paper attached (pg. 51-53)
PQView System Upgrade	\$ -	\$ 650	\$ -	See White Paper attached (pg. 54-63)
System Enhancements to Support Conservation Voltage Optimization	\$ -	\$ 500	\$ -	See White Paper attached (pg. 64-67)
Penn/Waterside	\$ 900	\$ -	\$ -	Project deferred as a result of a revised load forecast
Overhead Transformer Relief	\$ 1,642	\$ -	\$ 4,504	Work initially deferred for higher priority items as a result of optimization, however, subsequent engineering models identified a need for funding related to OH Transformer relief in Westchester and Staten Island
OH Feeder Sectionalizing	\$ 750	\$ -	\$ 30	Deferred for higher priority programs as a result of the optimization process
Rear-Lot Pole Elimination	\$ 1,437	\$ -	\$ -	Deferred for higher priority programs as a result of the optimization process
Coastal Storm Risk Mitigation	\$ 3,000	\$ -	\$ 1	Deferred for higher priority programs as a result of the optimization process
Secondary Monitoring (Secondary Model Validation)	\$ 4,000	\$ -	\$ -	Project eliminated for higher priority programs as a result of the optimization process
Unit Substation Load Relief	\$ 1,375	\$ -	\$ -	Deferred for higher priority programs as a result of the optimization process
<b>Shared Services</b>				
Astoria Outfall B (Consent Order)	\$ -	\$ 9,476	\$ 400	See White Paper attached (pg. 68-71)
Construction Relocation Buildout for Queens Blvd, Farrington and Gowanus	\$ -	\$ 2,000	\$ 2,470	See White Paper attached (pg. 72-74)
Integrated GIS Solutions Phase 0 Assessment	\$ -	\$ -	\$ 1,094	See White Paper attached (pg. 75-78)
PowerPlan Provision System Implementation Phase II	\$ -	\$ -	\$ 803	See White Paper attached (pg. 79-81)
Allocation (ALLOC) Mainframe Replacement	\$ -	\$ 400	\$ 262	See White Paper attached (pg. 82-83)
XBRL Reporting System	\$ -	\$ 250	\$ -	See White Paper attached (pg. 84-85)
Gas Rate Design and Analysis Systems	\$ -	\$ 582	\$ 625	See White Paper attached (pg. 86-88)
Repair Tax Allowance	\$ -	\$ 510	\$ 588	See White Paper attached (pg. 89-91)
Contact and Investigation Tracking System	\$ -	\$ 52	\$ 165	See White Paper attached (pg. 92-92)
Case Management System - Law	\$ -	\$ -	\$ 392	See White Paper attached (pg. 93-95)
CCTN Facilities Improvements	\$ -	\$ 561	\$ 615	See White Paper attached (pg. 96-98)
CCTN Modernization - Sonet Conversion	\$ -	\$ 338	\$ 366	See White Paper attached (pg. 99-101)
CCTN Expansion Buchanan	\$ -	\$ 507	\$ 522	See White Paper attached (pg. 102-104)
CCTN Expansion - Mobile WiMAX Access Network	\$ -	\$ 459	\$ 940	See White Paper attached (pg. 105-107)
CCTN Modernization - Mapping System	\$ -	\$ 506	\$ -	See White Paper attached (pg. 108-110)
Cyber Security - IR	\$ -	\$ 1,463	\$ 1,341	See White Paper attached (pg. 111-112)
Collaboration Tools	\$ -	\$ 500	\$ 493	See White Paper attached (pg. 113-114)
Desktop Infrastructure	\$ -	\$ 1,000	\$ 1,023	See White Paper attached (pg. 115-117)
Business Systems Sustainability - Upgrade Application to SQL Server 2008	\$ -	\$ 570	\$ 646	See White Paper attached (pg. 118-120)
Business Systems Sustainability - Upgrade Application to Windows 7	\$ -	\$ 570	\$ 625	See White Paper attached (pg. 121-123)
New Technology	\$ -	\$ 500	\$ 524	See White Paper attached (pg. 124-125)
Computer and Communications Accounting System	\$ -	\$ 113	\$ 93	See White Paper attached (pg. 126-128)
Install Communication Hut to Support Cctn, Verizon and Lan Facilities	\$ -	\$ 1,522	\$ 2,027	See White Paper attached (pg. 129-131)
Enterprise Software & Collaboration	\$ 1,216	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.

## Rate Plan vs. Capital Budget Explanations

	\$ Thousands			Explanation
	2012 Rate Plan	2012 Budget	2012 Actual	
Data Warehousing & Business Intelligence- IR	\$ 1,800	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.
Identity Management	\$ 550	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.
TEMS Enhancements	\$ 142	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.
User Technology Plan	\$ 240	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.
Replacement of Unsupported Technologies	\$ 911	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.
Warehouse Management System Upgrade - CFS	\$ 275	\$ -	\$ -	Project was deferred as a result of the portfolio optimization process.
Gas Accounting Automation (IGS)	\$ -	\$ 400	\$ 440	See White Paper attached (pg. 132-134)
Henwood Upgrade and Replacement Phase 0	\$ -	\$ 1,000	\$ 2,219	See White Paper attached (pg. 135-136)
TLC Infrastructure Upgrade - HR	\$ 600	\$ -	\$ 17	Project was deferred to address higher priority projects. \$17k charge in 2012 related to prior year project.
eLearning - HR	\$ 1,000	\$ -	\$ 333	Delay in finalizing terms & conditions for new contract
HR PeopleSoft Upgrade	\$ -	\$ 832	\$ 31	See White Paper attached (pg. 137-140)
GridOps Load Forecasting Enhancements	\$ -	\$ 750	\$ 728	See White Paper attached (pg. 141-142)
Total Rewards Programming Project	\$ -	\$ -	\$ 632	See White Paper attached (pg. 143-145)
Management Work Flow Records Retention Law Dept.	\$ 1,300	\$ -	\$ -	Construction is working with Law Dept to commence in 2013; white paper has been submitted. Refer to White Papers for Construction - See White Paper attached (pg. 146-147)
Install Public Improvement System	\$ 350	\$ -	\$ 163	Represents maintenance and enhancements to the system based upon audit recommendations for a central repository of PI project documents.
Wiring Access Raceway System (WARS)	\$ -	\$ 154	\$ 4	
Construction Survey Mapping Repository	\$ -	\$ 700	\$ 855	See White Paper attached (pg. 148-149)
Upgrade and Enhance Contractor Oversight System	\$ -	\$ 580	\$ 571	See White Paper attached (pg. 150-152)
Misc IT CEES integration Bid Check Estimate, Appropriations	\$ -	\$ 300	\$ 74	See White Paper attached (pg. 153-154)
Misc IT Work Coordination Street Activity	\$ -	\$ 250	\$ 340	See White Paper attached (pg. 155-157)
Misc IT Work Coordination Street Activity	\$ -	\$ 45	\$ 330	
Mobile Field Device	\$ -	\$ -	\$ 334	See White Paper attached (pg. 158-159)
Needs Immediate Corrective Action (NICA)	\$ -	\$ -	\$ 326	
Metaphase Replacement - Phase 2 (Project Explorer)	\$ -	\$ -	\$ 263	
Meter Data Management System (MDMS) Expansion	\$ -	\$ 200	\$ 239	See White Paper attached (pg. 160-161)
Business Continuity (Disaster Recovery)	\$ -	\$ -	\$ 234	See White Paper attached (pg. 162-162)
Iron/Cycle Meter Reading System	\$ -	\$ 1,701	\$ 1,864	See White Paper attached (pg. 163-163)
Steam Billing System	\$ -	\$ 325	\$ 1,059	See White Paper attached (pg. 164-167)
On Bill Financing	\$ -	\$ 1,000	\$ 917	See White Paper attached (pg. 168-169)
Bronx Customer Walk-in Center	\$ -	\$ -	\$ 255	See White Paper attached (pg. 170-170)
IRIS Handheld Devices	\$ -	\$ -	\$ 1,014	See White Paper attached (pg. 171-171)
Facility Flush Improvements	\$ -	\$ 14,003	\$ 7,190	See White Paper attached (pg. 172-173)
AMR Bronx Saturation	\$ -	\$ 15,000	\$ 15,829	See White Paper attached (pg. 174-175)
AMR New Meter Purchases	\$ 315	\$ -	\$ -	Project was moved to Meter Purchases within Electric Distribution.
<b>Electric Production</b>				
Boilers	\$0	\$4,470	\$5,271	See white paper attached (pg. 176-177)
Waterfront	\$4,000	\$0	\$0	\$4.0M originally requested in rate plan shifted to higher priority projects.

## Capital Unit and Unit Cost Data

### Substation Operations Variation Analysis By Program

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
138kV Circuit Breaker Capital Upgrade	5	6	-17%	\$ 668	\$ 1,000	-33%
Replace Overduted 13/27kV Circuit Breaker Programs	41	65	-37%	\$ 111	\$ 162	-31%

### Electric Distribution Variation Analysis By Program

#### Meter Installation

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Meter Installations	41,347	70,926	-42%	\$ 341	\$ 245	39%

#### Overhead Emergency Response

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Poles, Towers, Fixtures	892	247	261%	\$ 28,492	\$ 40,586	-30%
Overhead Primary Conductor	1,350	635	113%	\$ 5,439	\$ 3,816	43%
Overhead Secondary Conductor	1,219	985	24%	\$ 1,438	\$ 1,623	-11%
Overhead Service Conductor	2,538	2,995	-15%	\$ 1,875	\$ 402	366%
Overhead Street Light Conductor	766	504	52%	\$ 899	\$ 1,818	-51%
Aerial Cable	578	28	1964%	\$ 6,439	\$ 64,824	-90%

#### Transformer Installation Emergency Response

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Transformer Installation	1,183	1,325	-11%	\$ 19,900	\$ 14,795	34%
Overhead Transformer Installation	305	1,498	-80%	\$ 23,356	\$ 2,791	737%

#### Network / Non-Network Transformer Relief

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Conduit	12,036	15,975	-25%	\$ 489	\$ 506	-3%
Underground Primary Cable	114	161	-29%	\$ 37,658	\$ 24,679	53%
Underground Secondary Cable	505	422	20%	\$ 20,039	\$ 19,194	4%
Underground Transformer Installation	70	114	-39%	\$ 20,938	\$ 36,938	-43%

#### Secondary Open Mains

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Secondary Cable	4,765	5,852	-19%	\$ 19,616	\$ 19,788	-1%
Underground Conduit	51,831	45,620	14%	\$ 514	\$ 611	-16%

#### HiPot

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Primary Cable	190	110	73%	\$ 24,965	\$ 28,251	-12%

## Capital Unit and Unit Cost Data

### PILC

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Primary Cable	523	703	-26%	\$ 25,868	\$ 23,958	8%
Underground Conduit	2,427	8,178	-70%	\$ 662	\$ 505	31%

### Underground Secondary Reliability

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Conduit	25,974	20,704	25%	\$ 409	\$ 393	4%
Underground Structures	280	164	71%	\$ 16,794	\$ 20,799	-19%
Underground Primary Cable	145	56	159%	\$ 13,116	\$ 23,911	-45%
Underground Secondary Cable	741	536	38%	\$ 18,764	\$ 23,766	-21%
Underground Transformer Installation	285	297	-4%	\$ 16,760	\$ 8,202	104%

### Remote Monitoring System

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
RMS Installation	944	2,516	-62%	\$ 2,330	\$ 2,165	8%

### Network Reliability

Description	Actual Units	Budget Units	Variance	Actual Unit Cost	Budget Unit Cost	Variance
Underground Primary Cable	725	403	80%	\$ 9,651	\$ 33,750	-71%
Underground Conduit	6,181	13,240	-53%	\$ 529	\$ 833	-36%

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White Papers

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Pipe Enhancement Program
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Mark Bauer
<b>Project Engineer</b>	Michael Simone
<b>Budget Reference</b>	1ET3001
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	Oper Risk 07 Prolonged Transmission Substation Loss, Oper Risk 12 Safety Hazards to Public or Infrastructure Integrity, Oper Risk 19 Significant Oil Spill Water Damages

### Work Description:

The Pipe Enhancement Program is a proactive program to reduce dielectric fluid leaks and increase the availability of transmission facilities. This program focuses on addressing areas of corrosion on the pipe-type transmission feeder system and involves the large-scale installation of welded barrels to encase heavily corroded areas and the installation of new coating, along with the associated required excavation, coating removal, inspection, and backfill/restoration tasks. This program will provide increased reliability, extend the useful life of existing pipe-type feeder facilities, and prevent or reduce the likelihood of the release of dielectric fluid from the pipe-type feeder system to the environment.

Suspect areas of feeder pipe have been identified based on leak history data and field observations of pipe/coating conditions. Large areas of disbonded coating (where the existing coal tar coating is not necessarily missing but may be cracked and poorly adhered to the exterior surface of the pipe) have been identified as a significant issue for certain critical pipe-type feeders. Disbonded coating allows moisture to migrate onto the pipe surface beneath the coating. In addition, disbonded coating shields the flow of cathodic protection current, preventing it from reaching the surface of the pipe. As a result, severe corrosion can occur beneath the coating, causing significant pipe wall loss and dielectric fluid leaks.

Dielectric fluid leaks may necessitate that feeders be removed from service if the leak rate exceeds the flow rate capability of the pressurization pumps. If a leaking feeder was left in service and operating pressure could not be maintained, failure of the cable system can result, requiring an extended outage to complete repairs. In addition, even if pressure can be maintained, a feeder with a large leak may be forced out of service in order to clamp and repair the leak if the release of fluid cannot be adequately controlled during the repair process. These issues can have detrimental effects on overall system reliability, especially during high load periods.

If feeder pipe conditions are allowed to deteriorate due to disbonded coating or other corrosion-related issues to the point where significant wall loss has occurred over large portions of a feeder, a pattern of

repeated, significant leaks can be anticipated. At some point, these leaks will greatly diminish feeder reliability and effectively limit the feeder's useful life. To proactively prevent this condition, the Pipe Enhancement Program addresses large-scale coating problems to eliminate future corrosion, as well as restores pipe wall thickness in already deteriorated areas. This is accomplished by encapsulating areas of wall loss with a new layer of pipe welded over the original pipe, over its full circumference, and coating that surface with a new protective coating system. In effect, the corroded pipe is "replaced" without removing the old pipe, which of course could not be done without affecting the energized feeder cables inside.

Mitigation of the release of dielectric fluid to the environment is a critical component of the Company's efforts to achieve environmental excellence. The Company sets an annual goal to minimize the volume of dielectric fluid released to the environment from the pipe-type feeder system and tracks the actual volume against this goal each month.

The Pipe Enhancement Program will continue the trend of significantly reducing the dielectric fluid volume loss as the most suspect sections of pipe on the Transmission System are proactively addressed.

**Justification:**

This Pipe Enhancement Program will result in a reduction of the number of leaks in the sections of pipe which will be addressed. By addressing corrosion issues before the pipe leaks occur, we are able to reduce the amount of dielectric fluid that is lost to the environment and the associated costs for leak emergency response and remediation. We also reduce the probability that the feeder will need to be removed from service or fail due to an oil leak caused by corrosion on the pipe.

- \* Alternatives: Although much work has been and is being done through our R&D Department by benchmarking with other companies and through our participation in EPRI and NACE, to date we have found no other proactive alternatives available to address the corrosion issues on transmission feeder pipes mainly due to the presence of cable in the pipe.
- \* Risk of No Action: Not addressing sections of deteriorated pipe will, over time, result in increased loss of dielectric fluid to the environment due to feeder pipe leaks and increased spending in the area of feeder emergencies. In addition, if the loss of dielectric fluid is severe enough, it may result in the removal of feeders from service while leaks are located and repaired
- \* Non Financial Benefit Explanation: Protection of the environment, increased reliability, and extension of the useful life of the pipe-type feeder system are all significant non-financial benefits. In addition, building better key external stakeholder relationships with organizations such as the DEP, DEC, and PSC is another major non-financial benefit.
- \* Technical Evaluation and Analysis: As discussed, large areas of disbonded coating (where the existing coal tar coating is not necessarily missing but may be cracked and poorly adhered to the exterior surface of the pipe) have been identified as a significant issue for certain critical pipe-type feeders. Disbonded coating allows moisture to migrate onto the pipe surface beneath the coating. In addition, disbonded coating shields the flow of cathodic protection current, preventing it from reaching the surface of the pipe. As a result, severe corrosion can occur beneath the coating, causing significant pipe

wall loss and dielectric fluid leaks. Further, studies have shown that paper-insulated pipe-type transmission cable has an exceptionally long life if proper pressurization is consistently maintained. Pressure excursions due to repeated, significant leaks may also directly impact cable life as well. The duration a cable is in service at pressures below the minimum specified operating pressure will adversely affect the useful life of the cable once the voltage stresses exceed the capability of the insulating system to withstand them. As pressure on a pipe-type feeder system decreases, the insulating capability of the system decreases and ionization (and eventual electrical breakdown) of the paper insulation can result. Even if a specific leak incident does not result in immediate failure of the cable, the long-term effective life of the cable may have been reduced.

\* Project Relationships:

**Current Status:**

Status:

The Pipe Enhancement Program is an on-going annual program. Currently for 2012, a work package consisting of 340 trench feet on Feeders M51/M52 on West End Avenue from 84th to 85th St was completed in March. A total of (16) pipe repairs (including (12) repair barrels covering 39 linear feet of pipe) were made on heavily corroded areas to prevent future leaks.

A work package to complete 555 trench feet on Feeders M51/M52 on West End Avenue from 103rd to 105th St is in progress. To date, as part of this work package a total of (22) pipe repairs (including (9) repair barrels covering 30 linear feet of pipe) have been made on heavily corroded areas to prevent future leaks.

Funding:

The requested funding is based on a projection of areas that need to be addressed in recognition of recent leak events referencing actual total capital costs incurred from the recent work package completed on West End Ave from 84th St to 85th St. Each year the estimated length to be completed will be in the range of 1,000 to 1,500 trench feet at an approximate capitalized cost on the order of \$5,000 per trench foot. The unit cost per trench foot can vary greatly depending on several variables including: the degree of corrosion uncovered, condition of original coating, the number of pipes and subsurface interference in the trench, environmental remediation requirements due to historical contamination, street restoration requirements, and community/traffic impact.

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$5,000	\$7,300	\$5,200	\$5,400	\$5,600	\$5,800	\$0	\$0	\$34,300

**Benefit: (\$000s)**

\* **2008 to 2012 Budget in Thousands-** \$5,000

\* **2013 to 2017 Budget in**      \$29,300  
**Thousands-**

\* **Authorization-**

\* **Appropriation-**

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Reinforce Hudson River Crossing Towers
<b>Project Number</b>	20895-03
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	
<b>Project Manager</b>	Davis, Mark
<b>Project Engineer</b>	Cocking, Orville
<b>Budget Reference</b>	8ET9804
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2012
<b>ERM Addressed</b>	Oper Risk 07 Prolonged Transmission Substation Loss, Oper Risk 16 Southern Milwood Transmission Loss

### Work Description:

This program involves upgrading the east and west Hudson River crossing towers that support 345kV feeders Y88 and Y94 between Verplanck, NY (east side) and Stony Point, NY (west side). This will be achieved by installing additional structural steel members and upgrading bolts to increase the structural capacity of these towers. Additional work includes installation of pendulums and spacers on Feeders Y88 and Y94 and the installation of a new elevator for both East and West Towers. Work for Y88 is complete. All reinforcement work is complete except for two steel members on the West crossing tower. The elevators are 90% complete. A change order has been submitted to install landing platforms for the elevators on each Tower.

Mandatory: Yes. Upgrades to the elevators and fall arrest systems are required as per American National Standard Z359.2-2007 and OSHA Standard 29 CFR 1926, subpart M.

High-level schedule: Complete elevator installation and fall arrest modifications by 2011, upgrade steel members and bolts in 2010 and 2011, install anti-galloping devices in 2011 and 2012 during feeder outages, and complete final demobilization in 2012.

### Justification:

Recent engineering analysis of these structures indicates that numerous members are significantly overloaded under various load cases. In 1997 the east tower was heavily reinforced at the top bridge after a severe structural failure occurred, causing Y88 to remain out of service for approximately one month, and nearly causing the complete failure of the 473' tall tower. Subsequent to this repair additional reinforcing was also installed on the Stony Point tower. The most recent engineering analysis indicates that the towers need to be upgraded in order to meet time of construction and current National Electric Safety Code and Con Edison design criteria. The material lifts need to be replaced to facilitate access for routine inspection and maintenance.

Anti-galloping pendulums are to be installed to reduce the possibility of

any future events from occurring. Recent engineering analysis of these structures indicates that numerous members are overstressed according to NESC 2007 and Con Edison specified load cases. Hence, the installation of additional steel members and the upgrading of bolts will be performed to increase the structural capacity of the towers.

The towers were equipped with elevators and fall arrest systems during the tower upgrades in 1971. These systems do not meet OSHA Standard 29 CFR 1926 subpart M limiting the user group from utilizing the tower components. Replacements of such systems are a recommended improvement for the work associated with this request as well as for regularly scheduled maintenance and inspection

- \* Alternatives: The only alternative to this program would be not to upgrade the steel tower members or fall arrest system to existing codes which would not be prudent.
- \* Risk of No Action: The risk of not completing the tower upgrades could be tower failure during ice and wind storms and non-compliance with OSHA regulations.
- \* Non Financial Benefit Explanation: Upgrading the tower increases employee safety and allows for climbing activities and other work to be done more efficiently.
- \* Technical Evaluation and Analysis: Engineering completed extensive structural analysis on the tower using specialized computer modeling programs and identified members that were being overstressed under specific conditions. Wind studies and conductor galloping studies were also completed to confirm the materials and equipment needed to reinforce the tower and conductors.
- \* Project Relationships:

**Current Status:** On-going.

**Current Working Estimate:** The CWE is \$6,582,000 as of June 2010.

**Funding: (\$000s)**

<b>Funding Cost</b>	2009	2010	2011	2012	2013	2014	2015	2016	Total
	\$2,536	\$1,829	\$2,195	\$850	\$0	\$0	\$0	\$0	\$7,410

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$7,410
- \* **2013 to 2017 Budget in Thousands-** \$0
- \* **Authorization-**
- \* **Appropriation-** This project is appropriated for \$6,600,000.

**2012 Capital - Central Operations/Transmission & Substation Operations**

<b>Project Name</b>	Fresh Kills - Replace limiting feeders associated with TR21W
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - System Capacity
<b>Priority</b>	21
<b>Project Manager</b>	P. Murphy
<b>Project Engineer</b>	J. Barlok
<b>Budget Reference</b>	2ES7300
<b>Project Status</b>	Not Started
<b>End Date</b>	Jun 1 2013
<b>ERM Addressed</b>	Oper Risk 06 Prolonged Electric Outtage Impact Customers,Oper Risk 08 Prolonged Area Substation Loss

**Work Description:**

Replace the limiting feeders associated with TR 21W at Fresh Kills Substation, in order to provide additional capacity at the station.

**Justification:**

In 2013, Fresh Kills substation will face a 9 MW capacity shortage unless steps are taken to provide additional capacity. This project, along with the installation of additional cooling on transformer 22E, will provide an additional 24MW of capacity--taking care of the shortfall in 2013 and providing additional capacity for future load growth.

\* **Alternatives:**

Load could be transferred from Fresh Kills to other Staten Island stations, but this will burden those stations as well, which are also expected to be close to their operating capacity. This would also require extensive field work by Electric Operations.

\* **Risk of No Action:**

If no action is taken, we will be unable to meet demand in the Fresh Kills load pocket in 2013, and would have to shed load on a first contingency event.

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	1000	1000	0	0	0	0	0	0	2000

\* **2007 to 2011 Budget in \$0 Thousands-**

\* **2012 to 2016 Budget in** \$2,000  
**Thousands-**

\* **Authorization-** \$0

\* **Appropriation-** \$0

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Replace Overduted Equipment at Greenwood Substation
<b>Project Number</b>	24077-10
<b>Work Plan Category</b>	Oper - System Capacity
<b>Priority</b>	17
<b>Project Manager</b>	C. Davoren
<b>Project Engineer</b>	S. Stroumbakis
<b>Budget Reference</b>	1ES6500
<b>Project Status</b>	Not Started
<b>End Date</b>	Dec 31 2014
<b>ERM Addressed</b>	Oper Risk 06 Prolonged Electric Outtage Impact Customers, Oper Risk 07 Prolonged Transmission Substation Loss, Oper Risk 08 Prolonged Area Substation Loss

### Work Description:

This project has been initiated to replace circuit breakers, disconnect switches, and bus at the Greenwood Substation that are overloaded or may be overloaded in certain projected system configurations.

There are a total of 5 circuit breakers that require replacement - 7S, 6S, 2N, 5N, and 7N.

There are a total of 6 disconnect switches that require replacement - 5N4, 7N7, 1S1, 1S8, 8N7, and 4N4.

There are 2 section of bus that require replacement - between feeders 38B11 and 23161, and between feeders 38B14 and 42231.

This equipment will be replaced with higher rated equipment that will remove the overload conditions.

### Justification:

Transmission Planning performed a study of the Greenwood Substation, looking at equipment loading levels under various contingencies. It was determined that a number of breakers, disconnects, and bus sections were overloaded.

### \* Alternatives:

Do Nothing - This alternative is not recommended, as the overloaded equipment would be subject to failure during contingency events.

Develop Operating Protocols to Remove the Overloads - This alternative is not recommended, as it would likely result in severe limitations in our operating capabilities, and would have a negative impact on reliability.

**Current Status:**

2011 Planned Work: Upgrade Bus Section 2S- (9/18/2011 – 9/20/2011)  
2012 Planned Work: Replace Bus Section 7S (10/8/12 -10/12)  
Replace Breaker 2N (10/15/12 – 11/17/12)  
Replace Breaker 7N and disconnects 7N7 & 8N7 (12/10/12 – 1/17/13)

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	1000	4000	4000	2500	0	0	0	0	11500

- \* **2007 to 2011 Budget in Thousands-** \$1,000
- \* **2012 to 2016 Budget in Thousands-** \$10,500
- \* **Authorization-** \$12,000,000
- \* **Appropriation-** \$789,000

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Construct Relay Enclosure Houses
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	38
<b>Project Manager</b>	R. DeNezzo
<b>Project Engineer</b>	K. Davis
<b>Budget Reference</b>	8ES4900
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	Oper Risk 06 Prolonged Electric Outage Impact Customers

### **Work Description:**

This program is to install weatherproof enclosures to preclude deterioration of the relay cabinets while providing for safe inspection, maintenance, and repairs under all weather conditions. The installation of the weatherproof enclosures is a long-term solution to protect relay cabinets from inclement weather and enhance the reliability of the electric system. The weatherproof enclosures will consist of a structural frame with composite wall panels attached to the frame. These frames and panels will enclose the existing relay cabinets. Due to the slenderness of these panels, in some cases this housing can be mounted onto the existing relay cabinet foundations. Presently, the following facilities have relay enclosures that are targeted for construction:

- Vernon Substation (2 enclosures)
- Corona Substation (4 enclosures)
- Greenwood Substation (4 enclosures)

- Units per year: This program is funded to complete 2 enclosures in 2012 and 4 enclosures in 2013 at a unit cost of approximately \$250,000 each.

### **Justification:**

Relays are usually housed in heavy gauge steel cabinets designed to be water tight. When these steel cabinets are exposed to weather, they will deteriorate with time. In various substations, several of these outdoor relay cabinet installations are deteriorated and jeopardize the reliability of the electric system.

Relays are used to detect electrical problems or faults in transmission and area substations. When these relays detect a fault, they send a signal that operates protective equipment, such as a circuit breaker, which will isolate the

fault and limit the damage. Relays will also send a signal to the control room and notify the station operator of the electrical hazard. It is important to ensure that these relays will always function because the detection of electrical problems in the substation will protect the operators in the area, limit the potential damage on substation equipment, and will minimize the number of customer outages. For these reasons, relays must be maintained in a dry and safe environment.

The metal relay cabinets are exposed to the elements and they have deteriorated over time. This has allowed water to enter the cabinets, and we run the risk of compromising the equipment and jeopardizing the reliability of the station. The areas of the roofs that are deteriorated and allowing water to get into the cabinets could be repaired using a new roofing membrane. This will not provide the same safety environment that a new enclosure would create for mechanics working out in the rain. Installation of weatherproof enclosures will preclude deterioration of the relay cabinets while providing for safe inspection, maintenance, and repairs under all weather conditions. The installation of the weatherproof enclosures is a long-term solution to protect relay cabinets from inclement weather and enhance the reliability of the electric system. The weatherproof enclosures will consist of a structural frame with composite wall panels attached to the frame. These frames and panels will enclose the existing relay cabinets. New ground bus, area lighting, and AC power distribution panels are installed in each new enclosure as well as a wall air conditioner to provide summer cooling. The existing foundations typically need to be extended to provide enough clearance between the existing relay cabinets and the new enclosures for maintenance and operation activities.

- \* Alternatives: An alternative to the current solution is to build masonry structures to provide protection for the relay cabinets. This is a higher cost option and therefore not recommended.
- \* Risk of No Action: The risk of no action would be increased frequency of repairs and inspections and reduced reliability.

**Funding: (\$000s)**

Funding Cost	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
	31	1466	0	0	500	1000	1000	1000	1000	5997

- \* **2007 to 2011 Budget in \$1,497**

**Thousands-**

\* **2012 to 2016 Budget in** \$4,500  
**Thousands-**

\* **Authorization-** \$4,900,000

\* **Appropriation-** \$0

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Corona - Stabilization of Pothead Stand Supports
<b>Project Number</b>	23334-09
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	39
<b>Project Manager</b>	N. Roberts
<b>Project Engineer</b>	M. Rendon
<b>Budget Reference</b>	2ES4300
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	Oper Risk 08 Prolonged Area Substation Loss

### Work Description:

This is a multi-year project to correct equipment settlement problems at the Corona Substation. The project is being completed in stages with construction being performed when Engineering develops and issues a package for each segment of work. The scope of work in these packages typically include stabilizing pothead and disconnect switch stands, and installing prefabricated concrete control cable trenches.

### Justification:

The Corona substation was constructed on reclaimed land. Many of the structures and buried facilities are settling, resulting in damage to foundations, troughs, conduit, splice boxes, and cable. In the past five years, we have experienced damage to substation equipment.

A settlement study was performed by Muser Rutledge Corporation to determine if settlement will continue or if we have reached the end of the settlement issue. Their report states that the ground surface settlement will continue to occur as the result of secondary compression of organic, marsh soils immediately underlying site fills, but at a decreasing rate. Due to expected continued settling, installation of trenches is the first required action to allow for the replacement of existing control cables impacted by the current settlement. This trench system is required to mitigate the problem created by equipment foundation settlement. To ensure that the new trench will not settle, helical screw piles and continuous concrete-grade beams will be used to support it.

### \* Alternatives:

Increase the size of the existing footings to further spread out the structural loads in the surrounding soil. This alternative will only decrease the rate of settlement, but not prevent it, therefore this alternative was rejected.

\* Risk of No Action: The stabilization of the pothead stands is required to prevent further bending and damage to the existing electrical conduit risers that connect to the pothead. If the potheads are not stabilized, the existing electrical conduit risers that connect to the pothead will continue to bend and will eventually:

- Feeder or pothead could fail; this could force unscheduled outages at the station, jeopardize the integrity of the equipment and the station, and create safety issues for the employees working at the station.

- Feeder or pothead could leak oil causing environmental issues and clean-up.

Current Status: 2010 Completed Work:  
 Stabilized the pothead stand structures for feeders 18184 and 34185  
 Stabilized the pothead stand structures for feeders 18001 and 18002

2011 Planned Work:  
 Stabilization of Disconnect Switches 9N8, 9N9, 10N9, and HF8

**Funding: (\$000s)**

<b>Funding Cost</b>	2010	2011	2012	2013	2014	2015	2016	2017	Total
	684	1785	1000	1000	1000	1000	1000	0	7469

- \* **2007 to 2011 Budget in Thousands-** \$2,469
- \* **2012 to 2016 Budget in Thousands-** \$5,000
- \* **Authorization-** \$9,900,000
- \* **Appropriation-** \$4,191,000

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Disturbance Monitoring Equipment Program
<b>Project Number</b>	various
<b>Work Plan Category</b>	Reg - Agency Mandated
<b>Priority</b>	47
<b>Project Manager</b>	A. Bykov
<b>Project Engineer</b>	Peter Chan
<b>Budget Reference</b>	1ES6400
<b>Project Status</b>	On Going
<b>End Date</b>	Dec 31 2016
<b>ERM Addressed</b>	Oper Risk 07 Prolonged Transmission Substation Loss, Oper Risk 08 Prolonged Area Substation Loss

### Work Description:

This program will increase the amount of Disturbance Monitoring Equipment (DME) deployed throughout the Con Edison transmission and sub transmission system. DME includes Digital Fault Recorders, Sequence of Event Recorders, and Dynamic Disturbance Recorders. The scope of the program includes:

- Installation of new DME at 21 transmission substations.
- Installation of new DME at up to 63 area substations.
- Expansion and upgrades of the existing DME capability at 18 transmission substations.

The details of the final scope are contingent upon the final approved NERC Reliability Standard PRC-002-NPCC-1, and upon the final definition of the "Bulk Electric System" as it applies to NPCC and to Con Ed.

- Units Per Year: The current plan is to start the start expansion/upgrade this year at Rainey substation. Then complete approximately 25% of the required work each year, for the next 4 years.
- Mandatory:
- High-Level Schedule: Start in 2011, complete in 2016.

### Justification:

This program is required to comply with the new regional NERC Reliability Standard PRC-002-NPCC-1. This standard has been approved by NPCC Membership (January 2010), NPCC Board of Directors (February 2010) and by NERC Board of Trustees (November 2010). Final approval by FERC and Canadian entities is expected in the near future. Upon their approval, a NERC Implementation Plan becomes effective.

### \* Alternatives:

There is no alternative, as compliance with approved NERC Reliability Standards is legally mandatory.

- \* Risk of No Action: Fines for each day of non-compliance.
- \* Non Financial Benefit Explanation: Increased ability to analyze system disturbances and determine root causes of incorrect relay operations. Increased ability to validate dynamic models of power system equipment.
- \* Project Relationships: Implementation will not require extensive power system outages.

**Current Status:** The FERC has not yet approved the NERC reliability standard PRC-002-NPCC-1. Engineering developed scoping documents for the following substations: Rainey, Ladentown and East 13<sup>th</sup> Street. These substations have no fault and sequence of event recoding capabilities. The plan for 2012 is to purchase the equipment for the stations listed.

**Funding: (\$000s)**

Funding Cost	2011	2012	2013	2014	2015	2016	2017	2018	Total
	1100	8000	8000	8000	8000	0	0	0	33100

- \* **2007 to 2011 Budget in Thousands-** \$1,100
- \* **2012 to 2016 Budget in Thousands-** \$32,000
- \* **Authorization-** \$20,000,000
- \* **Appropriation-** \$0

## 2013 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Geomagnetic Induced Currents (GIC) Monitoring Project
<b>Project Number</b>	24165-11
<b>Work Plan Category</b>	Reliability
<b>Project Manager</b>	L. Finer
<b>Project Engineer</b>	J. Mooney
<b>Project Status</b>	On Going
<b>End Date</b>	May 2013
<b>ERM Addressed</b>	Oper Risk 07 Prolonged Transmission Substation Loss, Oper Risk 08 Prolonged Area Substation Loss

### Work Description:

Solar storm or geomagnetic disturbance (GMD) events have demonstrated their ability to disrupt the normal operations of the power grid. The most recent example in North America occurred in March 1989, when a GMD led to the collapse of the Hydro-Quebec system, leaving more than six million people without power for nine hours.

Geomagnetic induced currents (GIC), interact with the power system, are produced when a large coronal mass ejection (CME) at the sun occurs and is directed at Earth. Charged particles from the CME interact with Earth's magnetosphere-ionosphere and produce ionosphere currents, which perturb Earth's geomagnetic field, inducing voltage potential at the Earth's surface, resulting in GIC. Long transmission lines can act as a conducting path allowing quasi-DC currents to enter and exit the power system at transformer grounds, disrupt the normal operation of the power system and in some cases, cause damage to the equipment.

There are two risks that result from the introduction of GICs to the bulk power system:

- 1) Damage to bulk power system assets, typically associated with transformers.
- 2) Loss of reactive power support, which can lead to voltage instability and power system collapse.

Currently there is limited GIC monitoring and no comprehensive GIC monitoring equipment installed at the Con Edison transformers.

**Justification:**

This project proposes the installation of comprehensive GIC monitoring equipment for the vulnerable transformers selected based on a detailed GIC study and the design of the transformers. This monitoring equipment will be installed for 14 transformers located at 10 substations. The equipment will send indication and alarms to Energy Control Center (ECC).

Installation of the GIC equipment in the substation will allow for continuous monitoring of several parameters by the ECC and will allow System Operators to take appropriate action in the event of GIC affecting any of the transformers. This will enhance the overall reliability of the Con Edison system during major solar storms.

\* Current Status:

- Engineering complete.
- Appropriation complete.
- Equipment procurement complete.
- Construction in various stages of completion. On schedule for May 2013 final completion for all affected substations.

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012 (actual)	2013	2014	2015	2016	2017	2018	Total
	0	\$1121	TBD	0	0	0	0	0	

\* **2008 to 2012 Actuals in Thousands-** \$1121

\* **2013 to 2017 Budget in Thousands-** \$TBD

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Jamaica - Install Fall Protection System
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - Public & Employee Safety
<b>Priority</b>	41
<b>Project Manager</b>	N. Graham
<b>Project Engineer</b>	K. Davis
<b>Budget Reference</b>	2ES8700
<b>Project Status</b>	Not Started
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	Oper Risk 03 Fatality Due to Safety Negligence

### **Work Description:**

Fall protection for the Jamaica switchgear sections can be provided by means of overhead cables supported by the existing roof beams in the station. Steel cables are to be attached to existing roof beams by means of an I-beam bottom flange clamp or an I-beam bottom flange trolley. Worker's harness lanyards can then be attached to the steel cable as a means of fall protection. Engineering's initial review has determined that due to the loading conditions created by the equipment on the roof, modification to the existing beams may be required to meet OSHA fall protection loads.

If the roof beam cable option cannot be implemented due to overhead obstructions, fall protection can also be provided by a system of overhead cables, strung between columns above the switch gear cubicles. The cables can be anchored between two existing columns. Connections to the columns will be provided by means of a pad eye welded to the column. Worker fall protection lanyards would then be attached to the overhead cable with the ability to slide laterally along the cable.

Lanyards must be secured above the point of operation whenever a safety harness is used and anchored to a structural member capable of supporting a minimum dead weight of 5,000 pounds. The lanyard must have a maximum length to provide for a fall of no greater than 6 feet that would not contact any lower level (as per CEHSP 18.00).

### **Justification:**

In Jamaica Substation, access to the top of the 27 kV switchgear, bus enclosures, conduit, wire raceway trays and roof is challenged by safe access and fall protection issues. Due to additional equipment installations on the roof as well as the age and exposure to the elements, weather damage to the roof has caused it to develop multiple leaks and there is a need

to maintain tarps to contain and divert leaks away from equipment. There is a need to safely access the top of switchgear equipment, wire raceway trays and ducts as well as the roof. There currently is no safe way to easily access these areas.

\* Alternatives:

Mezzanine Option A

In order to address the access issue to the top of the switchgear equipment, wire raceway trays and ducts, an engineering study was conducted for installing a mezzanine platform system around the interior of the station. This option includes installing a steel grating catwalk to be hung from the roof steel framing. This catwalk would be installed above the bus level. Additionally, temporary supports are needed in order to access different levels at which the equipment is located. This option is not recommended since it only provides access to a level above the bus work, but not to all levels which would require temporary platforms or ladders to access. Also, this option has a high cost associated with it and engineering believes that the fall protection cable system is a more cost effective option.

This option is estimated to cost approximately \$6.5 million (loaded) and expected to be ruled capital. It should be noted that this \$6.5 million cost includes \$2.75 million for a fall protection system for the entire station.

Mezzanine Option B

Another option would be to provide access to the switchgear sections only. This option includes installing steel grating catwalks on top of the switchgear cubicles, and would be installed at the level just below the existing ducts. This system would be hung from the existing steel roof framing or from supplementary steel, if necessary. In order to access the catwalk, new staircases would also need to be installed. Engineering does not recommend this solution as it does not address the access problem to the wire raceway trays and ducts, only the switchgear sections. Also, this option has a high cost associated with it and engineering believes that the fall protection cable system is a more cost effective option.

This option is estimated to cost approximately \$6.4 million (loaded) and expected to be ruled capital. It should be noted that this \$6.4 million cost includes \$2.75 million for a fall protection system for the entire station.

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	1000	1000	0	0	0	0	0	0	2000

- \* **2007 to 2011 Budget in** \$0  
**Thousands-**
- \* **2012 to 2016 Budget in** \$2,000  
**Thousands-**
- \* **Authorization-** \$0
- \* **Appropriation-** \$0

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Switchgear Enclosure Upgrade Program
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	49
<b>Project Manager</b>	J Dorn
<b>Project Engineer</b>	W. Ziminski
<b>Budget Reference</b>	8ES1200
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	Oper Risk 06 Prolonged Electric Outtage Impact Customers

### **Work Description:**

This program will modify and upgrade selected outdoor switchgear enclosures throughout the system ensuring the switchgear cubicles are weatherproof.

### **Justification:**

The switchgear cubicles in a number of substations require upgrading. These outdoor switchgear housings are typically about 40 years old. They have been weathered by the years of exposure to the elements. Their construction is typically a sheet metal enclosure resting on a concrete slab. Many steel components are corroded. The exterior doors no longer close and seal correctly. Many slabs are deteriorated and do not allow proper drainage accelerating corrosion of the housings. The roofs leak. The upgraded enclosures will reduce weather intrusion related trip outs, unscheduled outages, and alarms.

\* **Alternatives:**

An alternative is to replace the switchgear. This is not a reasonable consideration because the high cost and significant outage requirements of replacement

\* **Risk of No Action:**

The locations scoped into this program have been included due to the fact that the enclosure conditions present a risk to the reliable operation of the equipment housed within the switchgear. The risk of no action is a higher probability of unanticipated equipment failures and outages.

### **Current Status:**

Planned work for 2011:  
W42nd St, East 63<sup>rd</sup> St, and East 75<sup>th</sup> St Substations will have their switchgear enclosures upgraded to prevent weather intrusion.

Planned work for 2012:  
 East River, Leonard St, Parkchester No.1 and Jamaica  
 Substations will have their switchgear enclosures upgraded  
 to prevent weather intrusion.

**Funding: (\$000s)**

<b>Funding Cost</b>	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
	19	86	123	1100	1000	1000	1000	1000	1000	6328

- \* **2007 to 2011 Budget in Thousands-** \$1,328
- \* **2012 to 2016 Budget in Thousands-** \$5,000
- \* **Authorization-** \$4,500,000
- \* **Appropriation-** \$945,000

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Circuit Switcher Replacement Program
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	52
<b>Project Manager</b>	M. Galantich
<b>Project Engineer</b>	P. DiIillo
<b>Budget Reference</b>	9ES3200
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2014
<b>ERM Addressed</b>	

### Work Description:

We have identified 4 circuit switchers on our system where maintenance activities have become increasingly more challenging. The S&C Mark 2 and the S&C type G are no longer supported by the manufacturer with parts or service. This program will replace one (1) circuit switcher per year with a reliable upgraded model at a unit cost of \$600K per circuit switcher. As this program proceeds, additional circuit switcher makes/models may be identified as challenges to maintenance effectiveness. As these are identified they will be scoped into this program for future years of the program.

In 2008, a circuit switcher was purchased for the replacement of one associated with Gowanus Substation Reactor 18. Due to system constraints, an outage to perform the replacement could not be obtained in 2008 and unit was subsequently replaced April, 2009. In addition to this replacement, the circuit switcher associated with Gowanus Reactor R6 was planned for replacement in the fall of 2009 but an outage could not be obtained. Due to a failure of Rainey CSW 5W, the kit for R6 was used to rebuild this failed switch. A new kit has been received and R6 is scheduled to be replaced in 2011. Beyond 2011, the plan is to continue to replace one circuit switcher per year from the following list of circuit switchers presently scoped into the program:

- Millwood TA1
- Sprain Brook CS-49

As the program progresses, other circuit switchers will be considered for replacement based on concerns such as performance, reliability, and difficulty in procuring replacement parts.

### Justification:

A failure of these circuit switchers would compromise the reliability of the equipment that it is associated with and, consequently the system as a whole. Since the equipment is no longer manufactured, part procurement is increasingly difficult. Delays in procuring replacement parts could translate into extension of outage times and consequently a decrease in system reliability. Replacing these circuit switchers will ensure the ability to properly maintain the equipment and their continued reliability.

- \* Alternatives: The alternative is to take no action. This is not recommended as the unavailability of spare parts increases the risk of extended outages and increased maintenance costs in the event of equipment failure.
- \* Risk of No Action: This is not recommended as the unavailability of spare parts increases the risk of extended outages and increased maintenance costs in the event of equipment failure.

**Funding: (\$000s)**

<b>Funding Cost</b>	2008	2009	2010	2011	2012	2013	2014	2015	Total
	367	470	0	700	1000	1000	1000	0	4537

- \* **2007 to 2011 Budget in Thousands-** \$1,537
- \* **2012 to 2016 Budget in Thousands-** \$3,000
- \* **Authorization-** \$3,000,000
- \* **Appropriation-** \$700,000

## 2012 Capital - Central Operations/Transmission & Substation Operations

<b>Project Name</b>	Goethals - VFT Project Oversight
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	
<b>Project Manager</b>	
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2014
<b>ERM Addressed</b>	Oper Risk 07 Prolonged Transmission Substation Loss, Oper Risk 08 Prolonged Area Substation Loss

**Work Description:**

Project oversight costs for the VFT project, which is installing new breakers and bus sections at Goethals S/S, to support VFT's interconnection to the Con Edison system.

**Justification:**

- \* Alternatives:
- \* Risk of No Action:
- \* Non Financial Benefit Explanation:
- \* Technical Evaluation and Analysis:
- \* Project Relationships:

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$1,500	\$1,000	\$800	\$0	\$0	\$0	\$0	\$0	\$3,300

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$1,500
- \* **2013 to 2017 Budget in Thousands-** \$1,800

\* **Authorization-**

\* **Appropriation-**

**2012 Capital – Electrical Operations**

<b>Project/Program Title</b>	Targeted Primary DBC Replacement
<b>Project Manager</b>	Christopher Jones
<b>Project Engineer</b>	Christopher Jones
<b>Status</b>	Ongoing
<b>Estimated Service Date</b>	
<b>Work Plan Category</b>	System and Component Performance

**Work Description (Includes units per Year and a high level schedule):**

This program targets primary and secondary Direct Buried Cable (DBC) cables to be replaced with cable-in-conduit (CIC) to improve the reliability of Underground Residential Distribution (URD) customers and to reduce burnout expenditures incurred to repair DBC cables. Candidate cables for replacement usually experienced two or more failures at different spots along the cable section where often the insulation is found to be cracked or split. These candidate cables for replacement will be prioritized appropriately to address the highest urgency replacements.

**Justification (Technical Evaluation/Analysis):**

Based on historical records, approximately 60% of all URD customer interruptions were due to insulation breakdown of DBC primary and secondary cables. These interruptions result in an increase in SAIFI by an average of 22 outages/year and 46 outages/year for Westchester and Staten Island, respectively. On average, it takes 20% longer to locate and repair a fault when it occurs on DBC than it does to repair a fault that occurs on the same cable installed in a conduit. From 2002 to 2007, an average of 1,250 URD customers each year in Westchester and Staten Island (98% of all URD customers) experienced a service interruption due to problems with DBC. Targeted installation of URD cable-in-conduit for both primary/secondary sections and services will reduce the amount of DBC on the system thereby reducing URD customer outage frequency (SAIFI) by approximately 60% and reducing annual repair expenses.

**Alternatives:**

URD Cable Rejuvenation Rehabilitation and Fault Indicator Program

**Risk of No Action:**

Continued customer interruptions due to URD cable failure

**Summary of Benefits (financial and non-financial):**

**Project Relationships (if applicable):**

**EH&S Overview:**

**Analysis of Prior Year Funding Request Versus Actual:**

**Data Reports Issued that Support Program:**

**Specifications & Procedures Pertaining to Program/Project:**

**Is this a mandated program? If yes, include verbiage associated with mandate:**

**Funding Forecast (Capital or O&M):**

<b>Actual 2008</b>	<b>Actual 2009</b>	<b>Actual 2010</b>
2,409	310	992

	<b>2011 CWE</b>	<b>2012 Request</b>	<b>2013 Request</b>	<b>2014 Request</b>	<b>2015 Request</b>	<b>2016 Request</b>	<b>5 yr (12-16)</b>
<b>Funding (\$000s)</b>	600	524	520	500	463	449	2,456

## 2013 Capital – Electric Operations / Distribution Engineering

<b>Project/Program Title</b>	Modernization Program for CECONY Transformer Vault Distribution Structures
<b>Priority Number</b>	
<b>Project Manager</b>	Joe Somma
<b>Project Engineer</b>	Jane Raba
<b>Budget Reference</b>	
<b>Project Number</b>	
<b>Status</b>	On-going
<b>Estimated Service Date</b>	On-going
<b>Work Plan Category</b>	Reliability/Performance Enhancement, Life Extension, Safety
<b>ERM Addressed</b>	Potential Structural Collapse – Prevention of harm to personnel, general public, and equipment

### **Work Description:**

The Modernization Program for CECONY’s Electric Distribution Transformer Vault Structures is a proactive program to mitigate public and system safety concerns from structures that have been identified as requiring major/non-routine upgrades. These upgrades encompass significant **rebuilt**s of walls, floors, and roofs of subsurface vaults , involving steel, concrete and masonry components, along with the associated required excavation, waterproofing, inspection, and backfill/restoration tasks. This program will provide increased reliability and extend the useful life of existing structures by making the property affected more useful, more efficient, and provide for greater durability, while creating safer environments for personnel, the general public, and in general, underground infrastructure.

Transformer Vault locations requiring major upgrades are primarily identified and recorded by field forces as part of Electric Distribution Information System (EDIS) inspections. Occasionally, customers and municipalities also notify Con Edison of inferior structures. Structural deficiencies may include, but are not limited to: settled structures, cracked concrete, spalled concrete, collapsed walls, collapsed ceilings, corroded steel beams and columns, and corroded rebar.

Unattended deficiencies may lead to:

- Employee injuries and trip/fall incidents
- System impacts including damaged transformers and cable from falling debris and delays in restoring system outages due to temporary work stoppage
- Settled structures and cracked concrete that generate fines by the City of New York as part of the NOV/CAR system
- Damage to customer premises due to water intrusion at customer service take-offs, since structural damage prevents adhesion of waterproofing materials.

The company has developed several protocols and procedures to provide direction for implementing a major structural reconstruction program, from structural deficiency reporting to final rebuild. The latest engineering materials including epoxy-coated rebar, concrete roof waterproof membranes, embedded steel beams, anti-corrosive galvanizing paint over beams and welds, and fiber-reinforced concrete have been incorporated into protocols for complete structural modernization. On-the-Job Training (OJT) has been developed to guide proper construction techniques for concrete, asphalt, and soil. Special inspections and laboratory testing are specified in accordance with local municipal requirements.

**Justification:**

Attention to structural deficiencies deemed severe by Con Edison specifications are mandatory as part of EDIS, in accordance with a mandate set by the PSC.

- Alternatives: No other alternative has been identified.
- Risk of No Action: Not addressing locations of deteriorated structures will, over time, result in increased structural damage, increased water damage, increased spending at times of feeder-restoration emergencies (due to employee work stoppages), increased damage to transformers and equipment, , and potential for injury. At locations where temporary measures such as steel plates are installed, trip/fall hazards and potential fines by the city will exist. Steel plates prevent air-flow to structures reducing the capacity of equipment.
- Summary of Financial Benefits and Costs: The cost of altering a vault roof post-incident can cost up to ten times the cost of altering a vault pre-incident. Three pre-incident case studies are listed below:

**Case Study 1 – Roof Replacement:**

Cost to Upgrade Vault Roof and to Replace Transformer:

Description	Unit Cost	Units	Cost
Roof Replacement	\$50,000	1	\$50,000
Install Primary Cable	\$37,912	1	\$37,912
Install Secondary Cable	\$27,984	8	\$223,872
Remove Primary Cable	\$24,890	1	\$24,890
Remove Secondary Cable	\$15,530	8	\$124,240
Install Transformer	\$14,712	1	\$14,712
Remove Transformer	\$5,069	1	\$5,069
Transformer Replacement	\$47,000	1	\$47,000
Total Cost:			\$527,695

**Case Study 2 – Wall Replacement:**

Description	Unit Cost	Units	Cost
Wall Replacement	\$30,000	1	\$30,000
Install Primary Cable	\$37,912	1	\$37,912
Install Secondary Cable	\$27,984	8	\$223,872
Remove Primary Cable	\$24,890	1	\$24,890
Remove Secondary Cable	\$15,530	8	\$124,240
Install Transformer	\$14,712	1	\$14,712
Remove Transformer	\$5,069	1	\$5,069
Transformer Replacement	\$47,000	1	\$47,000
Total Cost:			\$557,695

**Case Study 3 – Floor Replacement:**

<b>Description</b>	<b>Unit Cost</b>	<b>Units</b>	<b>Cost</b>
Floor Replacement	\$50,000-\$150,000	1	\$50,000–\$150,000
Install Primary Cable	\$37,912	1	\$37,912
Install Secondary Cable	\$27,984	8	\$223,872
Remove Primary Cable	\$24,890	1	\$24,890
Remove Secondary Cable	\$15,530	8	\$124,240
Install Transformer	\$14,712	1	\$14,712
Remove Transformer	\$5,069	1	\$5,069
Transformer Replacement	\$47,000	1	\$47,000

Total Cost: \$577,695 - \$677,695

- Non-Financial Benefits: Employee safety, public safety, increased reliability, extension of useful life, and mitigation of customer-related water damage complaints are all significant benefits. Additionally, this program would assist in building better relationships with key external stakeholder organizations such as the NYC DOB, NYC DOT, Mayor’s Office, and the PSC.
- Technical Evaluation/Analysis: Damage reports resulting from inspections performed as part of the 5-year EDIS cycle, are further analyzed by Distribution Structural Engineers to determine patterns in structural damage based on structure type, construction time period, and environmental impacts. Based on this analysis, structural alterations are prioritized taking into account a combination of factors including safety impact, customer service impact, and system impact.
- Sensitivity Analysis (if applicable):
- Project Relationships: Structural work must be performed in conjunction with customer and system outages, requiring coordination between Distribution Engineering, Electric Operations, Energy Services, and Construction Management.

**Estimated Completion Date:**

On-going

**Status:**

On-going annual program

**Current Working Estimate (if applicable):**

**Funding Forecast (Capital or O&M):**

<b>Actual 2009</b>	<b>Actual 2010</b>	<b>Actual 2011</b>
0	0	0

	<b>2012 Budget</b>	<b>2013 Request</b>	<b>2014 Request</b>	<b>2015 Request</b>	<b>2016 Request</b>	<b>2017 Request</b>	<b>5 yr (13-17)</b>
<b>Funding (\$000s)</b>	5,000	5,000	5,000	5,000	5,000	5,000	25,000

**2012 Capital – Electric Operations**

<b>Project/Program Title</b>	Joint Pole Use Software
<b>Project Manager</b>	Richard Benkwitt
<b>Project Engineer</b>	Kenneth McDonagh/John O’Neill
<b>Status</b>	In Progress
<b>Estimated Service Date</b>	June 2013
<b>Work Plan Category</b>	

**Work Description (Includes units per Year and a high level schedule):**

Verizon and Con Edison jointly use poles that are owned by each company. This project will establish a “Pole Lifecycle Management” system that will reconcile and maintain pole ownership records in a common database and maintain, track and communicate pole projects. We intend to jointly survey the estimated 350-400,000 (~250k each year) telephone, electric, and foreign poles in the Company’s service area so that all poles are captured in one web-based database of poles and attachments. We expect to use 10-20 inspectors and administrative help to correct and reconcile records into our new database. The “Pole Lifecycle Management” system will be shared with all attachers, municipalities and owners. Other benefits are use of a common pole badge; GPS/GIS map capability, tracking hit poles and double wood poles, centralization of pole inspections, and joint use communication and tracking. We jointly (Verizon/CECONY) reviewed several software vendors and selected InQuest PLM for the flexible and modular system that can be extended to other utilities. We intend to connect to Verizon’s Pole Record System (PRS) and CECONY’s WMS in 2013 or later to automate processes between owners.

**Units per Year:** ~250,000 poles (total estimated poles are 400k of various ownership)

**Justification (Technical Evaluation/Analysis):**

As per our 1982 Joint Use Agreement (JUA) and 2008 Agreement contract between Verizon and Con Edison, CE has agreed to improve the joint use notification and pole ownership tracking.

From the 2008 Agreement between Verizon and Con Edison, both parties “shall cooperate in seeking to find and jointly use appropriate software to track future pole ownership under the JUA; develop a single pole badge for use in the Con Edison service territory; improve lines of communication and overhead planning work; and continue to field verify and update the Joint-Use Pole Ownership Survey”.

NYS PSC Proceeding 6-5-2008: SAFE-T 08-M-0593- Order approved 5/19 and issued 5/25/2011

“The order mandates that NY State pole owners develop software that will aid in identifying and eventual reduction in double wood conditions across the State. Electric and Telephone company pole owners as well as third party attachers met with the PSC to finalize the software to be used by all parties.” SAFET staff recommended InQuest SAFET (Part of PLM) to track DW statewide which was approved 5/19/2011. PLM was delayed until April 2011 pending this PSC decision. This is a 2 year collaborative on-going “pilot” with 4 additional years for determining IQ-SAFET (InQuest Technologies) viability. Our PLM is built on the same platform as IQ-SAFET.

PLM and new survey will determine ownership and collect double wood for SAFET and Verizon contract settlement agreement to comply with 08-M-0593. Once ownership is determined then correct billing for pole attachments by third parties will be solved complying with 2003 order 03-M-0432 for correct billing of third party attachments.

**Alternatives:**

Breach of contract and non-compliance with the Verizon JUA, PSC Order 03-M-0432 for third party billing, and on-going PSC Proceeding 08-M0593 for SAFE-T double wood and pole tracking.

**Risk of No Action:**

Breach of contract and non-compliance with Pole Attachment and SAFET PSC mandates and Verizon contractual obligations.

**Summary of Benefits (financial and non-financial):**

Avoids \$341/pole annually in annual carrying charges (O&M). Avoids double pole fines. Avoids \$2,200/pole capital expenditure on 40% of pole population. Ensures accurate records of utility assets (poles). To date the 2008 settlement financial return has been over \$22 million from Verizon back to CECONY and ratepayers and reduced over 3.5 million in annual carrying charges.

Better work process and planning of overhead pole line projects. A Detailed analysis of how the process should work indicates first a survey of existing records between the two majors owners is needed, and a reconciliation of those records into one single asset repository for correct and on-going tracking of utility pole assets by both Verizon and Con Edison. Incorrect or disputed records lead to poor planning and extra expenses. Pole line project planning is affected adversely by poor records. A survey would ensure a better planned process and joint use of poles leading to planning efficiencies. Correct pole ownership records would ensure correct attachment billing after the initial survey is reconciled by both owners in compliance with PSC 3<sup>rd</sup> party billing order 03-M0432. Double wood would be identified and transfer costs assembled for a better plan to reduce or eliminate DW. More joint use of poles through cooperative planning would lead to reduced future requests for pole project funding. A single PLM system would connect all users of the poles and ensure correct ongoing data for accurate recordkeeping. Using experienced local utility inspectors with knowledge of the Verizon and Con Edison system for survey purposes ensures more accurate results. Future enhancements may lead to combining 5 year overhead inspections and possibly stray voltage inspection into one visit would reduce the need for multiple visits. One problem is the timing required by the different needs, stray voltage being annual. An ongoing effort and review will lead to a possible reduction in total survey needs. Working together with Verizon, we choose InQuest leading to one supplier of a pole lifecycle management system for joint owners/users to ensure better and more coordinated approach to the management of the pole lines by the major owners and users. SAFET caused delays in Verizon committing to InQuest, but in January 2011 Verizon committed to use InQuest. NGRID and Iberdrola also want to use InQuest since PSC staff recommended InQuest IQ\_SAFET in 2011 and approved by the full commission on 5/19/2011 and issued 5/25/2011. Connecting to existing CECONY & Verizon PRS and proposed WMS systems to make the system more useful is part of the overall strategy, and will be researched as the project moves along. The plan is to have one solution in a modular format so each utility in the rest of NY State can also use the system. A proposed new single badge state-wide is being worked towards as a viable solution to no duplicate of pole badges anywhere in NYS. Verizon has committed to the single badge solution we designed which allows for GIS/GPS.

\*\*Funding was developed and the financial benefits of the project.(Cost reductions, Increased revenues, Analysis of costs & cost/unit, Explanation of variance from historical year(s)Units and Cost per Unit, Payback period, Breakeven point, net present value, Main drivers of increase or decrease, Mandates, Procedures, Impact on performance, etc. Detailed description of steps the company has taken to ensure the cost effectiveness of the project. Include prior cost reduction and process improvement efforts.)

**Project Relationships (if applicable):**

Verizon pole projects. All overhead pole layout work. WMS and Verizon Pole Record System (PRS). Mapping project.

**EH&S Overview:**

PSC order 03-M042 to correct pole ownership and ensure correct billing to Third Party requires ownership to be correct first. PSC SAFE-T proceeding reviewed Double Wood (DW) (old pole/new pole same location) problem and recommended need for a Pole Lifecycle Management type system concerning the joint use of poles by multiple joint owners and attachers, is being submitted to the full commission. DW is a problem throughout the utility industry in overhead areas where multiple users and owners of the pole lines creates recordkeeping nightmare. PSC is looking to utilities to come up with a statewide initiative and solution. DW leaves old poles behind which is unsightly and a maintenance problem. Municipal fines and other actions are occurring more frequently to force a resolution. Cost is \$340 annually per pole in O&M expense to maintain a pole so ownership records and timely removals would ensure funding is going towards new poles and not poles that should be retired or owned otherwise. New PLM system would ensure Verizon's pole treatment would be identified before we swap pole into our plant property. Verizon's pole failures due to lack of formal inspection program cause outages to customers. PLM will track inspections between all owners and users and identify poles not inspected in a timely manner.

**Analysis of prior year funding request versus actual:**

Compare last years funding request versus actual and provide explanation for variance.

Due to purchase orders not processed, delay obtaining Verizon final commitment until Jan. 2011, SAFET proceeding delay, and additional survey work requested, need to move project end date up to Dec. 2013.

2010-11 (Subtotal 2010 - \$2,312k) (move from 2009 to 2010 due above delays)

1a) Joint Use Software (Delivered Jan. 2010)	
InQuest Vendor & IR support	\$562k (paid)
1B) Survey Tool (2011)	
Walkout (Field Collection Device) Tool	\$275k (paid)
1C) Data Center (Changed to external support) 2011	
Hosting, Licensing, M&S 6 years	\$676k (paid)
2) Field & Office survey works (Start ~July 2011)	
21,000 poles/month Plus QA (4 months Sept-Dec)	\$672k (pending)
IR/InQuest Mods/Support Joint Use	\$100k (pending)

2012 (Subtotal 2011 - \$2,312k) (move from 2011 to 2012 due to PO delays)

1) Joint Use Software	
InQuest Vendor & IR support - enhancements	\$195k
2) Field & Office survey work	
21,000 poles/mo for 12 months	\$2,000k
3) QA by CECONY mgmt of vendors work (10k/mo)	\$120k

**2013 Request**

Remaining Funds for Reconciliation  
 Ownership with Verizon Work \$1,303k

Project Approved Total 6,500k

Verizon coordination of InQuest Pole Lifecycle Management (PLM) internal PRS system will be linked to CECONY WMS.

**Data Reports issued that support program:**

2003 scientific survey indicated pole ownership ratio imbalance see June 2010 Verizon Parity report below, 2005 asset survey indicated additional data problems emanating from aggressive load relief and FIO’s projects by both companies and the need for better coordination. 2008 settlement papers attached below in (2) PDF files contract. 2008 Settlement white paper.

OH planning will provide planning going forward beginning with 2009, however, the proposed survey will reconcile both parties records and collect new data for proposed CECONY-Verizon joint use software tracking system for past pole ownership and third party attachment record keeping problems.



2008 Settlement White Paper.doc... SKMBT\_420080418 SKMBT\_420080418 June 2010 Verizon Parity Report.msg  
 14000.pdf (103 ... 14001.pdf (219 ...

**Specifications & procedures pertaining to Program/Project:**

(Include spec number and title) 1982 Joint Use Agreement and March 2008 settlement contractual obligations.

**Is this a mandated program? If yes, include verbiage associated with mandate:**

Yes.

**Funding Forecast (Capital or O&M)**

Actual 2008	Actual 2009	Actual 2010
22	360	1,089

	2011 CWE	2012 Request	2013 Request	2014 Request	2015 Request	2016 Request	5 yr (12-16)
<b>Funding (\$000s)</b>	1,400	2,315	1,303	0	0	0	3,618

## 2012 Capital – Electric Operations

<b>Project/Program Title</b>	Engineering Dashboard
<b>Project Manager</b>	Michelle Devlin
<b>Project Engineer</b>	Michelle Devlin
<b>Status</b>	
<b>Estimated Service Date</b>	
<b>Work Plan Category</b>	Strategic IT Enhancements

### **Work Description (Includes units per Year and a high level schedule):**

The Engineering Dashboard will provide a platform that brings together various data sources, present predetermined data graphically for reporting and tracking purposes, and help to eliminate the data discrepancies. Users will be able to view, access, and manipulate data of interest without having to rely on their knowledge of databases and/or queries. The Engineering Dashboard Application will provide users with a tool to evaluate distribution events in a timely manner and data obtained from it could also be used to expand or contract reliability programs.

The Engineering Dashboard will accomplish these goals by creating a data warehouse containing information from multiple data sources on three subject areas: feeder performance, stray voltage and inspections. The data sources included are: CAJAC, Contingency, FRA, Splice Ticket Database, Manual SV Testing, TblESR, and EDIS. In the creation of the data warehouse we will utilize a bottom-up approach where the warehouse is specifically designed to provide reporting and analytical capabilities for specific subject areas; the design will also allow for additional data sources to be incorporated in the future. The data warehouse will support the needed reporting and analysis as well as make the data appear consistent, integrated and consolidated to the extent possible given the quality and integrity of data in the underlying source systems. The presentation layer of the Engineering dashboard will leverage our existing investment in the data visualization software, Tableau. Tableau will provide a user friendly way to run ad hoc queries. In addition, Tableau has the ability to graphically analyze the populated data and produce charts, graphs, and reports, which will assist in providing insights to the data. To leverage the graphic ability of Tableau, dashboards will be created for the three subject areas. The dashboards will contain information that is required on a routine basis in order to inform all level of management of the Company's performance.

### **High Level Delivery Plan**

- A two-phased delivery is planned for the two subject areas. In 2011 the Feeder Performance subject area will be developed and in 2012 the Inspections and Stray Voltage Testing subject area will be completed.

### **Justification (Technical Evaluation/Analysis):**

In order ensure that data analysis is thorough, it requires an understanding of relationships, causes and effects and having that understanding spread throughout the organization. To do this requires a tool, such as the Engineering Dashboard, which will provide the ability of self service to evaluate, investigate and share.

Engineers and specialists are often required to interact with various applications and disparate data sources to gather information for analysis and studies. For example, in order to complete an analysis on system performance, it might be necessary to access data from Excel spreadsheets, databases, SQL servers and text files which can be time consuming and laborious. The Engineering Dashboard will

streamline these existing processes and create greater efficiency. Often times a report, chart, or analysis is requested that requires data from databases or sources that only a select few have access to and/or knowledge of. In this case and in every such case the availability of these select few are essential in completing the task. Another issue that is sometimes encountered with using multiple data sources with same or similar data is the discrepancies in which data that should match up does not. As a part of the data convergence in the data warehouse, the data will be standardized, redundancy issues resolved and the integrity of the data will be verified based on business rules. No data quality remediation will be performed on the existing data in the source systems.

As the company moves toward a strategic budget process, transparent analysis of past performance becomes increasingly important. The Engineering Dashboard will provide the ability to track specific performance metrics by converting data into information to be used for improved decision making on program funding. The analysis capabilities provided by the Engineering Dashboard will assist in the ability to quantify the merits of major reliability and safety programs in an effort to determine whether a program should be expanded, contracted or eliminated.

**Alternatives:**

The alternative is to continue to utilize numerous disparate data sources in order conduct system performance analysis and continue to depend on the select few resources that have knowledge of these systems and data.

**Risk of No Action:**

The creation of the Engineering Dashboard satisfies recommendation #3 of the Operational Audit 11-04: Broadway/Hart St. Incident Action Plan. If the Engineering Dashboard is not completed, Electric Operations will be in non-compliance.

System performance analysis information will not be available to larger group of people. The possibility for improved efficiency of system performance reporting will be lost.

**Summary of Benefits (financial and non-financial):**

- Provides access to users currently unable to view or unaware of the existence of this performance data. This supports the effort to provide transparency of data utilized for performance and budget review purposes.
- The data warehouse created will provide a common data model for all data of interest regardless of the data's source. This makes it easier to report and analyze information than it would be if multiple data sources were used to retrieve information. As a result, the time dedicated to the production of visuals and reports on performance will be greatly diminished. This will allow engineers to spend more time on the actual analysis instead of the compellation of material.
- Because the data warehouse is separated from operational systems, it will allow the user to retrieve information without slowing down operational systems.
- Prior to loading data into the data warehouse, inconsistencies are identified and resolved. This greatly simplifies reporting and analysis.
- The integration of different data sources on one platform opens up the possibility of drawing new conclusions from the data which previously were not clear due to the multitude of data sources.

**Project Relationships (if applicable):**

**Analysis of prior year funding request versus actual:**

### Funding Forecast (Capital or O&M)

Actual 2008	Actual 2009	Actual 2010
0	0	0

	2011 CWE	2012 Request	2013 Request	2014 Request	2015 Request	2016 Request	5 yr (12-16)
<b>Funding (\$000s)</b>	<b>575</b>	<b>675</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>675</b>

A review of the work required for the production of the Engineering Dashboard was completed and is outlined below.

#### Work Estimate

	Days work	Feeder Performance	Inspections & SV Testing
<b>Detailed Analysis &amp; Design (Data)</b>	<b>144</b>	<b>69</b>	<b>75</b>
Detailed analysis of existing reports	25	10	15
Data Source Analysis	18	10	8
Data Modeling	20	10	10
ETL – Operational Data Store	18	9	9
ETL – Data Mart	50	24	26
Other	13	6	7
<b>ETL Development &amp; Testing (data validation, rules, loading)</b>	<b>319</b>	<b>159</b>	<b>160</b>
Operational Data Store	180	90	90
Data Mart	110	55	55
Other	29	14	15
<b>Reports</b>	<b>122</b>	<b>42</b>	<b>80</b>
Design	46	19	27
Development and testing	76	23	53
<b>UAT and Deployment – Delivery 1</b>	<b>70</b>	<b>30</b>	<b>40</b>
Integration Testing	10	5	5
Integration Testing Remediation	10	5	5
User Acceptance Testing	15	5	10
UAT Remediation	15	5	10
Deployment	10	5	5
Documentation and training	10	5	5
<b>UAT and Deployment – Delivery 2</b>	<b>70</b>	<b>30</b>	<b>40</b>
Integration Testing	10	5	5
Integration Testing Remediation	10	5	5

User Acceptance Testing	15	5	10
UAT Remediation	15	5	10
Deployment	10	5	5
Documentation and training	10	5	5
<b><i>Total Work (days)</i></b>	<b>725</b>	<b>330</b>	<b>395</b>
ETL Architecture & Lead (20%)	145	66	79
Project Mgmt (20%)	145	66	79
<b>Grand Total</b>	<b>1015</b>	<b>462</b>	<b>553</b>

### Cost Estimate

- **Development Team:**
  - Includes funding for one Tableau developer (154 person-days)
- **Hardware & Software**
  - Production: 1 Windows server (8 cpu, 2x quad-core), SQL Server Enterprise Edition (2 sockets), 2 TB of storage
  - Existing IR infrastructure to be used for development and testing
  - DE will provide Tableau server and licenses for development, testing and production

## 2012 Capital – Electric Operations

<b>Project/Program Title</b>	Power Quality (PQNodes) System Upgrade
<b>Project Manager</b>	Cristiana Dimitriu
<b>Project Engineer</b>	Griffin Reilly
<b>Status</b>	Engineering
<b>Estimated Service Date</b>	2013
<b>Work Plan Category</b>	Strategic IT Enhancements

### **Work Description:**

Power Quality is addressing “any power problem manifested in voltage, current, or frequency deviations that result in failure or misoperation of customer equipment.” In 1993 Con Edison Power Quality group started the installation of PQ monitors (PQNodes) at the network level, and then in substations. The last Node was installed in July 2006. The data collected from these 122 monitors became very important for our Con Edison system. Distribution engineering, Relay Protection engineers, PQ, Equipment Engineers, Customer Reps and technicians, are using the PQ data to confirm, check, and analyze events and trends. In 2005 the PQ data started to be used for a new application, the Reactance-to-Fault application. The original Substation Power Quality Node Installation project specified one PQNode and one PQPager per station. The PQPager monitors only voltage, so there is no RTF based on the PQPager data, only based on that one PQNode monitoring one transformer. This project work, meant to make the PQ system more reliable and faster, will include:

- Replacement of the existing power quality pagers in forty six (46) substations with new DataNodes
- Installation of one more node (DataNode) on a second transformer in each station
- Enhancements of the reactance-to-fault (RTF) software / website
- Development of an interface between the monitoring data management / analysis system (PQView), and substation monitors (DataNodes)
- Server upgrade

Units per Year: 16

Mandatory: N/A

High-level schedule: N/A

### **Justification:**

In 2005 Distribution Engineering and the Power Quality group developed an application, **Reactance-To-Fault (RTF)**. It uses power quality data collected from substations during feeder faults and automatically indicates a fault location, to reduce fault-locating time on the primary feeder system. PQView software together with PVL impedance data is used to assist our Control Centers personnel with fault locating. This program, initiated in Manhattan, has demonstrated the capability of narrowing the location of feeder faults by utilizing data from the existing PQNodes and calculating distances to the faults based upon the reactive impedances.

Fault locating consumes precious time, manpower and prolongs the feeder outage; any reduction in fault locating time is therefore extremely beneficial, especially during the summer months when feeder restoration is key for system reliability. The results from this effort have been very impressive. The project reduced fault-locating time during the summer months by more than one hour. RTF is an important tool for improving our company reliability.

### **Alternatives:**

No alternative.

**Risk of No Action:**

Fault locating time could increase, and that means longer feeder outages, less reliable system.

**Summary of Financial Benefits and Costs:**

The project reduced fault-locating time during the summer months.

**Non-financial Benefits (if applicable):**

RTF is an important tool for improving our company reliability.

**Technical Evaluation/Analysis:**

In 1993 Power Quality group started the installation of PQ monitors (PQNodes) at the network level, one monitor per network. In 1997 the group initiated another project, installation of PQNodes in substations. The last Node was installed in July 2006. The data collected from these 122 monitors became very important for our Con Edison system. Distribution, Relay Protection, PQ, Equipment Engineers, Customer Reps and technicians, are using the PQ data to confirm, check, and analyze events and trends.

For PQ data (RTF included) to be more reliable there are improvements to be made.

1. The original Power Quality Substation Project specified one PQNode and one PQPager per substation. The PQPager monitors only voltage, so there is no RTF calculation based on the PQPager data. So each substation has one Node monitoring one transformer. If that transformer has an outage, the Node cannot provide any information on the network(s) fed from that station. Replacing the Pager with a new DataNode (the PQNode is now obsolete - the manufacturer, Dranetz-BMI, designed and produced a new version, the DataNode, more powerful, with Ethernet communication that would offer faster, real-time data) and installing one more DataNode on a second transformer in each station will be very beneficial.
2. Further enhancements of the RTF software / website are required, to improve accuracy from a more detailed model, a refinement in the error range estimation, development of a graphical representation to ease operator interface, and development of an automated fault type/signature recognition feature.
3. The need for more timely monitoring data from the monitoring equipment has become very important. When the system is providing information such as fault location directly to operations, the information becomes very critical and it must be available as quickly as possible. New methods of interfacing with the actual monitoring equipment are needed. The new methods must be extremely reliable and they must be able to obtain the data immediately following disturbances or some other alarm condition. What's needed is an interface between the monitoring data management and analysis system (PQView), and substation monitors (DataNodes) that provide information for real time applications.
4. A server upgrade is required to handle and store the increased volume of data to be collected from the 200 PQ monitors

**Sensitivity Analysis (if applicable):**

Fault locating consumes precious time, manpower and prolongs the feeder outage; any reduction in fault locating time is therefore extremely beneficial, especially during the summer months when feeder restoration is key for system reliability. For the time being a lot of the substations have one PQNode monitoring one transformer. If that transformer has an outage, or the Node is defective, the RTF program can not provide any information on the network(s) fed from that station.

**Project Relationships (if applicable):**

**Status:**

Engineering

**EH&S Overview:**

**Financial Overview/Cost Efficiency:**

The approved \$4,950,000 is not sufficient to cover the expenses for the expanded installation of PQ monitors in 46 substations.

	<b>Original Estimate</b>	<b>Re-estimate based on real expenditure</b>	
* Cost of DataNodes and hardware	\$624,000	\$624,000	
* Estimated cost of miscellaneous materials:	\$300,000	\$300,000	
* Overheads associated with the two items above:	\$300,000	\$1,476,336	(see Note 1)
* Cost of preparation/revision of existing station drawings	\$276,000	\$403,650	(see Note 2)
* Estimated labor cost to complete project:	\$2,300,000	\$3,068,568	(see Note 3)
* Software and server enhancements	\$800,000		
* Development of an interface between PQView and Node (EPRI)	\$100,000	\$1,147,216	(see Note 4)
* Contingency:	\$250,000	\$250,000	
 Estimated Total Cost (For 46 Area Substations):	 \$4,950,000	 \$7,269,770	

NOTES:

1. The Overhead increased dramatically - \$481,414 for 15 substations, \$32100 per station
2. The estimation was based on previous work, but designer rate went up
3. The estimation (50k per station) was based on previous work, but labor rate went up
4. The original estimate is not enough to complete the software enhancements

**Analysis of Prior Year Funding Request Versus Actual:**

	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>Original request (\$000s)</b>	1,650	1,650	1,650	795
<b>Actual (\$000s)</b>	467	434	1,544	906 (May)

**Data Reports Issued that Support Program:**

**Specifications & procedures pertaining to Program/Project:**

**Benefits/Outcome of Program/Project:**

The data collected from these area substation monitors is very important for our Con Edison system. Distribution, Relay Protection, PQ, Substation Equipment engineers and technicians are using the PQ data to analyze system events. The RTF project reduces fault-locating time by more than one hour, and is predicting feeder faults within 1 manhole for 68% of the events. RTF is an important tool for improving our system reliability.

**Is this a mandated program? If yes, include verbiage associated with mandate:**

**Funding Forecast (Capital or O&M):**

<b>Actual 2008</b>	<b>Actual 2009</b>	<b>Actual 2010</b>
467	434	1,544

	<b>2011 CWE</b>	<b>2012 Request</b>	<b>2013 Request</b>	<b>2014 Request</b>	<b>2015 Request</b>	<b>2016 Request</b>	<b>5 yr (12-16)</b>
<b>Funding (\$000s)</b>	1,706	1,559	1,560	0	0	0	3,119

## 2012 Capital – Electric Operations

<b>Project/Program Title</b>	Electronic Distribution Feeder Sign On
<b>Project Manager</b>	Maggie Chow
<b>Project Engineer</b>	Maggie Chow
<b>Status</b>	Planning
<b>Estimated Service Date</b>	3/31/2013
<b>Work Plan Category</b>	Strategic IT Enhancement

**Work Description (Includes units per Year and a high level schedule):**

A new Electronic Feeder Sign On system will be developed by IR using the business case, scope and detailed user requirements developed by Edison Project with all operating regions in 2007 to interface Rapid Restore and Mobile dispatch to allow qualified employees to sign on to feeders effectively and safely, this will reduce the phone call traffic to the Control Centers and accelerate the current "call in" sign on process. Three Sign On modules will be incorporated into this application: Crews signing on to perform spearing/clantech & cutting, pulling, and splicing of cable. The Rapid Restore system will be extended to support the following business requirements:

1. Allow splicing instructions jobs to be sent electronically from the Feeder Control Representative (FCR) to a “queue”, where it can be assigned by the operating supervisor to a qualified Distribution Splicer for work completion.
2. Allow spear and cut jobs to be sent electronically from the Feeder Control Representative (FCR) to a “queue”, where it can be assigned by the operating supervisor to a qualified Underground crew, Cable crew or Distribution Splicer for work completion.
3. Allow cable pulling jobs to be sent electronically from the Feeder Control Representative (FCR) to a “queue”, where it can be assigned by the operating supervisor to a qualified Cable crew for work completion.

Items which fall within the scope of the Feeder Sign On application include, but are not limited to:

- Both Scheduled and Troubled work which falls under jurisdiction of a FCR remains within the Scope of Project
- Identify and Validate users for authentication and authorization
- Provide interfaces to System Users (Schedulers and FCRs) for populating values and defining Scope of Work (SoW)
- Provide interfaces in order for FCRs to approve SoW (Scheduled and Troubled)
- Provide interfaces (questionnaire) to valid Users so that they can request a Sign On
- Replace the current manual process of getting a Sign On authentication; Devise a mechanism for declaring a match (or no match) for user defined SoW against System Data and eventually issue (or no issue) a work permit
- Send out notifications to eligible recipients in the events of Sign On and/or Sign Off authorizations
- Provide interfaces and manage Sign Off Processes
- Provide Assignment related graphical interfaces and later validate users during Sign On for Feeder Process Assignments
- Validate Feeder related information provided by users; this requires interfacing with an existing Source of Feeder Data

**Concept –: automated sign-on**

The automated sign-on system includes a series of carefully coordinated questions designed both to test the worker’s understanding of the situation and to seek worker’s assent to specific conditions to ensure safety checks and balances.

Such a system would function as a filter, granting sign-on only in cases where there is clear verification, and failing over to the existing system (verbal interview and confirmation) in all other cases. In this way, the system would confine its authority to only those cases for which automatic sign-on can be considered both effective and safe. A team of regional SMEs was assembled for almost a year to develop the coordinated questions and corresponding answers for our field situation. A SharePoint with mock screenshots and project related documents was also developed to support this initiative.

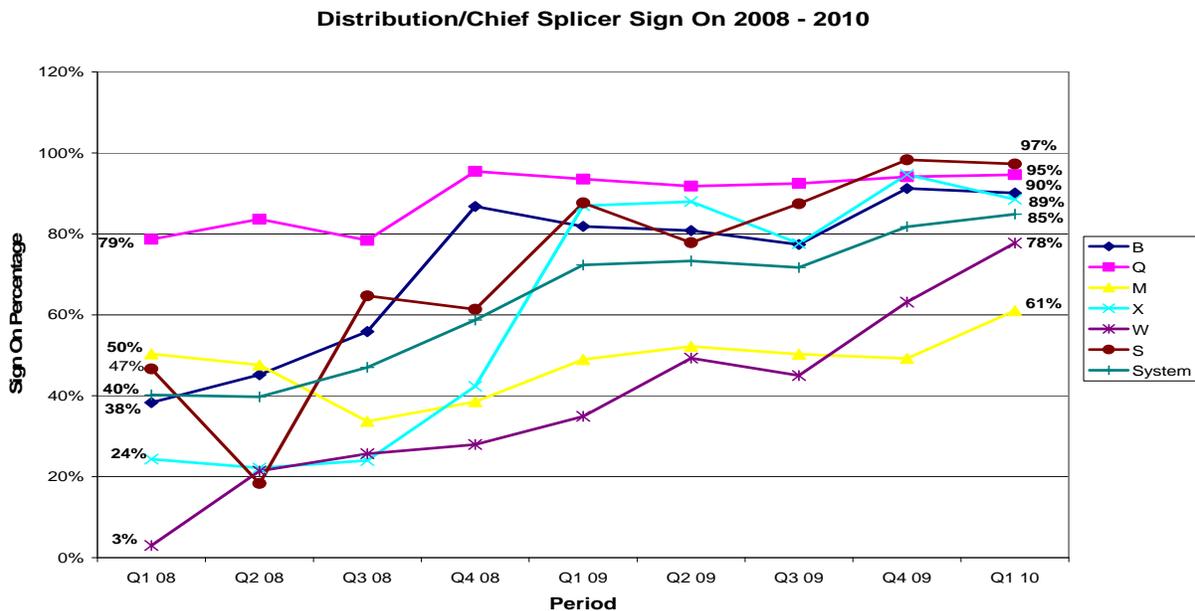
The Feeder Sign On committee has met frequently with IR to develop the scope and estimate of the application. The mock screenshots and project related documents in the Feeder Sign On SharePoint are carefully organized to anticipate funding budget. Once funding is established development of the application can begin right away.

**Justification (Technical Evaluation/Analysis):**

**Alternatives:**

Currently there are no alternatives being considered for expediting the Splicer sign on process. In June 27, 2004, the Company reached an agreement with the Union to expand the range of positions and job categories authorized to sign on to electrical work. This includes the set of workers known as “Distribution Splicers”. The reasoning is that when more individuals have the necessary authority, sign on could become easier, yet significant challenges exist: More people signing on also means greater load on the sign on system, thereby creating additional workload for the Control Center staff and adding Distribution Splicers would require training and experience. Figure A. shows the significant increase in the Distribution Splicer sign on rate from 23 % in 2007 to 85% in 2010. The human elements of getting involved to sign on by the union employees was carefully addressed by the Edison Project Team, in preparation to get the regional folks ready for the Electronic sign on application.

**Figure A.**



### Inconsistency of sign on authorization and procedure

One goal and benefit of a more efficient sign-on process would be to create and enforce consistency across the organization in how workers are authorized to sign on, how they are trained, and the sign on procedure itself.

### **Risk of No Action:**

Currently, the process by which Con Edison workers sign on to perform repair work is a manually-driven process involving direct two-way verbal communication with the Control Center in all cases. Delays occur as crews wait their turn to sign on and this can often take a long time. Delays are exacerbated by the interdependent nature of the work itself – downstream delays result when work is not completed on time, on shift, or in time for other work to begin on schedule. As indicated in Figure A, with the efforts from the Regional Management Team, the number of Distribution Splicers signing on to feeders has been steadily increasing from 23% (in 2007) to 85% (today). Each control center has one regional FCR on a shift to sign the worker on manually. This effort highlights the need for an Automatic Electronic Feeder sign on application. Schedule gains (time for completion), schedule improvement (ability to meet expectations) and resource utilization could all be improved if the sign on process could be made more efficient.

### **Summary of Benefits (financial and non-financial):**

#### Cost

The Electronic Feeder Sign On application is estimated to cost \$1.675 M.

#### Savings

In 2009 there were 36995 DS sign on and sign off total events (multiple sign on locations per feeder). Since all authorized personnel (Underground crews, Cable crews, Distribution Splicers) sign on and sign off are currently processing via one FCR at each of the Control Center, and they are mostly concentrated at first 2-3 hours of the beginning of a shift and the last 2 hours before the end of the shifts. This created a major traffic jam on the phone line of the FCR.

By using the queuing theory calculation, the estimated waiting time is 22.5 min per sign on/off event.

Crew is typically made up to two workers.

Man-hour rate is \$100

Savings (only includes DS)

- Sign On/Sign Off events in 2009: 36995
- Queuing theory, average wait time = 22.5 minutes
- Man-hr rate = \$100, 2-man crews
- Estimated percentage of Electronic sign on/off = 60% (excluded some complex job that might route to phone call directly to FCR)

$$\text{Savings} = 2 \times 100 \times 36995 \times (22.5/60) \times 0.6 = \$1,664,775$$

This translated to Return of Investment in 23 months. This also will provide COST SAVINGS of \$1.66 mil the years after the application is completed.

Increased benefit can be achieved if the “Electronic Sign on/off” is combined with the GPS system. This will provide for real time monitoring of crew arrival verses “sign on” and presents the opportunity to more effectively manage crew productivity. As an additional benefit, more efficient “sign on/off” results in expediting the processing of a feeder back into service. Reducing feeder outage times is a critical component in reducing the potential for multiple contingencies.

One of our main goals has been to reduce the feeder processing times; by reducing the time the feeder is kept out of service the occurrence of cascading feeder outages is also reduced. The bottleneck that occurs during sign on also occurs during sign off, after the crew is done with their work. The Electronic Sign On application will allow crews to sign off within a few minutes of completing their jobs. Increased crew productivity is also one of our main targets; by reducing the waiting time for sign on and sign off events we increase the availability of crews to perform additional work before the end of their shift.

The Feeder Sign On application will eliminate most of this delay by automatically alerting the FCR that sign off is complete so they can review the package and send it to the DO so the feeder restore process can begin. Thresholds will be established to ensure that this review takes place in a timely manner.

**Project Relationships (if applicable):**

**EH&S Overview:**

**Analysis of prior year funding request versus actual:**

In 2010, the ISM budget was totally eliminated in order to secure funding for the Corporate Work Management System. In the first 6 months of 2011 IR dedicated resources to completing work on HUD which was to be delivered before the summer. As a result IR anticipates spending \$405K out of the budgeted \$ 1 mil for this year.

**Data Reports issued that support program:**

**Specifications & procedures pertaining to Program/Project:**

**Is this a mandated program? If yes, include verbiage associated with mandate:**

**Funding Forecast (Capital or O&M)**

Actual 2008	Actual 2009	Actual 2010
0	2,776	0

	2011 Forecast	2012 Request	2013 Request	2014 Forecast	2015 Forecast	2016 Forecast	5 yr (12-16)
Funding (\$000s)	533	1,149	473	323	312	305	2,562

**2012 Capital – Electrical Operations**

<b>Project/Program Title</b>	SCN Replacement Program
<b>Project Manager</b>	Mofid Gerges
<b>Project Engineer</b>	Mofid Gerges
<b>Status</b>	
<b>Estimated Service Date</b>	2016
<b>Work Plan Category</b>	

**Work Description (Includes units per Year and a high level schedule):**

Currently there are 239 unit and multibank substations in the 4kV distribution system. 34 units are equipped with Network Terminal Unit (NTU) data concentrators from EFACEC ACS (also known as ACS units) that poll either GE Multilin microprocessor relays or RTUs from SATEC. These stations utilize DNP 3.0 as the communication protocol. 206 units are equipped with Station Control Node (SCN) data concentrators from PoweCom. The SCN units poll older RTUs that utilize an outdated HDLC protocol. These older RTUs cannot communicate using the DNP protocol an open source protocol which is widely used by other utilities and the standard communication protocol on our Con Edison distribution SCADA systems.

This project plans to replace the 206 SCN data concentrators with NTX data concentrators (manufactured by EFACEC ACS) which will be able to communicate using multiple protocols: the original communication protocol HDLC for the old RTUs, DNP 3.0 protocol and Modbus protocol to communicate with any new IEDs (Intelligent Electronic Devices). The plan is to replace the 205 in two phases over 5 years schedule:

Phase I: this phase will include developing a prototype data concentrator and replacing the first 21 units.

Phase II: upon successful completion of phase I, Distribution Engineering and Tech services will start ordering and replacing 185 data concentrator according to the schedule.

**Schedule:**

	2012	2013	2014	2015	2016
Material	Ordering 21 units for phase 1 & 21 units for phase 2 to be installed in 2013	Ordering 41	Ordering 41	Ordering 41	Ordering 41
Labor	Testing 1 <sup>st</sup> 2 units & installing the 1 <sup>st</sup> 20 units for phase 1	Starting phase 2 by Installing 62 units	Installing 41 units	Installing 41 units	Installing 41 units

**Justification (Technical Evaluation/Analysis):**

In order to ensure a reliable, durable and cost effective communication method to and from the 4kV Unit substations, the vintage SCN data concentrator must be replaced with a modern data concentrator that is equipped with up-to-date technology. The SCN data concentrators were originally installed in 1997 in the 4kV USS to provide SCADA communication to our 4kV USS. The SCN failure rate is increasing every year (in 2009 was 1 failure/month, 2010 was 2 failures/month, 1<sup>st</sup> 6 months of 2011 was 2.2 failures/month) making the SCN a highly unreliable device which affects the reliability and the availability of the 4kV SCADA system. The SCN devices are getting older and we anticipate 36 – 40 failures per year for the upcoming years.

In addition to the failure rate, the SCN manufacturer is no longer in business, so there is no new SCN devices available in the market to replace the failed units, SCN repairs are done in house in conjunction with three outside companies which makes the predicted reliability for the repaired units unknown.

On the technical side, the SCN data concentrator is a slow, single task device that cannot perform more than one task at a time which results in slow communications between the control center and the unit substations. The average down time of a unit substation due to SCN failure is between 24 – 48 hours, during which there is no remote control for the station and no data collection. Furthermore, SCN communicates with the station RTUs in HDLC protocol, this protocol is old and not utilized by other T&D companies. The support for the HDLC protocol is very limited. The experience within Con Edison in this protocol is also very limited. All new IEDs are using either DNP 3.0 or Modbus communication protocols. Since the SCN communicates using the HDLC protocol, it is incapable to communicate with any new IEDs.

**Alternatives:**

Upgrading the old system is not an option because the SCN is using an obsolete technology and the manufacturer is out of business. Tech services department is just managing the repairs by replacing the old vintage parts with an exact match.

**Risk of No Action:**

The existing system is becoming unreliable due to aging data concentrators. The high failure rate of the SCN causes loss of SCADA to these associated stations for extended periods of time. Also, there is limitation on using new SCADA devices since the new IEDs do not use the outdated HDLC protocol. The amount of data that can be collected from the station is limited due to the old SCN & RTU units. In other words, the old system has limited capacity that cannot be upgraded, and the system cannot accommodate new data points needed to serve new applications.

Keeping the existing system will lead to increasing failures, making repairs more challenging because of limited availability of the older components and because the original SCN manufacturer is out of business.

**Summary of Benefits (financial and non-financial):**

This project will improve the 4kV SCADA system: the new data concentrator unit will be a multitask device with much faster components; it can perform many tasks at the same time. The high communication speed will help improving the performance of many critical Control Center applications like the Load Shed and Restoration program (LSR) in XA21 system. Also, it will be able to communicate with all IEDs via the latest communication protocol like Modbus and DNP 3.0.

This feature will allow replacing the old RTU and the electromechanical relay with a new microprocessor relay with no restrictions because of the communication protocol. The microprocessor relays are more accurate, faster, and more reliable; provide more data points for the SCADA system which can be used in many engineering applications.

The project will enhance the reliability of the SCADA system because the new data concentrator will reduce the down time of the stations and the number of failed units will be reduced as well.

**Project Relationships (if applicable):**

**EH&S Overview:**

**Analysis of prior year funding request versus actual:**

**Data Reports issued that support program:**

**Specifications & procedures pertaining to Program/Project:**

**Is this a mandated program? If yes, include verbiage associated with mandate:**

**Funding Forecast (Capital or O&M)**

<b>Actual 2008</b>	<b>Actual 2009</b>	<b>Actual 2010</b>

	<b>2011 CWE</b>	<b>2012 Request</b>	<b>2013 Request</b>	<b>2014 Request</b>	<b>2015 Request</b>	<b>2016 Request</b>	<b>5 yr (12-16)</b>
<b>Funding (\$000s)</b>		1,000	1,000	862	854	842	4,558

## 2012 Capital – Electrical Operations

<b>Project/Program Title</b>	PQView System Upgrade
<b>Project Manager</b>	Cristiana Dimitriu
<b>Project Engineer</b>	Cristiana Dimitriu
<b>Status</b>	Engineering
<b>Estimated Service Date</b>	2014
<b>Work Plan Category</b>	Strategic IT Enhancements

### **Work Description (Includes units per Year and a high level schedule):**

Con Edison currently uses PQView 3 with power quality monitors at area substation transformers to locate faults on its primary distribution underground network. The power quality monitors serve as the voltage and current sensors in an automatic fault location system. Fault measurements captured by the monitors are downloaded automatically, integrated into a PQView 3 database, and processed by PQView 3 for impedance calculations. PQView 3 combines impedance calculations with up-to-date distribution circuit models and geographic information system data to build estimated fault location tables and map displays. The systems are integrated on Con Edison’s intranet and used in real time by numerous groups within Con Edison including operations, system protection, and power quality. The system can detect and locate incipient and permanent single-phase and multi-phase faults. PQView 3 also sends email alerts when subcycle faults and magnetizing inrush current transients are detected. For single-phase faults, the system’s accuracy regularly exceeds 80% success in estimating the fault location within 5% or less of the total number of the feeder structures (attachment 1). In 2008, the system was expanded to incorporate data from feeder relays and in 2009 it was expanded to include data from transmission digital fault recorders. In 2009, data from the PQ monitors, microprocessor relays, and digital fault recorders was integrated with operations data from the SCADA historian (PI) using PQView 3.

Analysis provided by PQView 3 is also has been integrated into control center and operations systems including the Heads Up Display (HUD), Visual Distribution Information System (VDIS) and the Feeder Management System (FMS). Integration in these systems has provided operators with automated decision support in key areas such as fault locating and determination if a Cut-In-Open-Auto is due to a fault or magnetizing inrush. Data analyzed by PQView 3 is also being integrated into an automated bus fault analysis and correlation tool for System and Electric Operations.

In addition to the information described above, PQView 3 also analyzes and provides critical operating information including fault duration, overvoltage conditions, relay targets, digital fault recorder oscillography, and smart meter data (from High Tension metering project). PQView has also been enhanced to analyze “follow on faults” which cause cascading in networks, and development is underway to analyze capacitor switching transients, breaker restrike, and breaker fault duties which can help drive asset management decisions. Additionally, as additional devices such as microprocessor relays and PQNodes are installed at our 4KV unit substations; they will be immediately and fully integrated with the same PQView 3 functionality that is used to analyze data at area and transmission substations.

Attachment 2 shows the relationship between the intelligent electronic devices, other data sources, PQView 3, the analysis performed, and major functionalities and systems in Con Edison supported by PQView.

PQView 3 is the primary analysis tool which allows long term characterization of the Harmonic Distortion Levels on the primary and secondary distribution systems as well as the development of voltage sag and momentary interruption performance indices.

PQView 3 is also playing a key role in our large scale, 10-network conservation voltage optimization (CVO) pilot project which is demonstrating MWhr and MVHr savings for customers. By integrating data from the PQNode and other intelligent electronic devices in our area substations and secondary networks, and federating data into the SCADA historian (PI), we are developing analysis tools in PQView centered around statistical process control theory that will facilitate full monitoring and improved performance reporting and control for the voltage and var control systems (VVC) at our area substations.

One of the primary reasons that Con Edison has chosen to build its fault location, inrush detection and other asset health diagnostic systems on the PQView 3 architecture is because of the wide variety of sensors and other instruments that can be integrated into a PQView system, and its demonstrated ease of use and access. As described above PQView 3 integrates data from power quality monitors, digital fault recorders, electronic relays, revenue meters, data historians, and SCADA systems. First and foremost, Con Edison uses PQView because it is a highly advanced system for processing IEEE Std 1159.3-2003 PQDIF files and IEEE Std C37.111-1991/1999 COMTRADE files. However, it also includes functionality for integrating devices using generic communication protocols such as Modbus. Furthermore, PQView has a large number of drivers for integrating data from many proprietary systems. This is critical as we evolve into a smarter grid with more and more intelligent electronic devices.

**Justification (Technical Evaluation/Analysis):**

Con Edison plans to expand the number of intelligent electric power system monitors by about 300% in less than five years. PQView is a critical component to provide automatic data gathering and analysis of measurements from these sensors for prognostics, diagnostics, analytics, and system restoration. Many of the PQView 3 libraries are based on enterprise development tools that have passed out of mainstream support by Microsoft . These PQView 3 design limitations make it a weak link in the overall goal of having greatly expanded data acquisition of grid parameters that focus on disturbance prevention and reliability improvement. Therefore, reengineering PQView is a critical need for a smarter, more reliable Con Edison electric delivery system.

Expansion of the number of intelligent electronic devices on our systems makes the upgrade of PQView by the creation of the PQView 4 platform more urgent: features such as PQView 4's scalability, its ability to import and process data more autonomously and reliably, its greater support for various device integration standards (e.g., IEC 61850), and its extensibility via a software development kit, make PQView 4 a key component to moving forward in this arena.

## ***PQView 4***

This project will reengineer and extend the domain models, database schema, software libraries, algorithms, services, and applications used in PQView 3 into a new application suite that will be known as PQView 4.

## ***New Technology Platform***

As powerful and flexible as it is, the PQView 3 architecture is based on dated, deprecated, and superseded technologies. Many of the PQView 3 libraries are based on enterprise development tools that have passed out of mainstream support by Microsoft. These older technologies are not the best fit given the current state of technology and current and future needs of PQView. Moving to a new technology platform is a primary and critical driver for PQView 4, and is required in order to ensure PQView's longevity and to allow it be a host for diverse smart grid prognostic and diagnostic applications, which are both critical capabilities for sustaining reliability of our electric transmission and distribution system. This new platform would be a key enabler that would allow for improved features, flexibility, performance, availability, and scalability. PQView 4 will be based on Microsoft's modern development platforms: .NET Framework, Silverlight, and SQL Server, using the latest Visual Studio development tools. PQView 4 will employ a Service Oriented Architecture (SOA) and leverage "smart client" and "rich Internet application" (RIA) technologies. It will include built-in support for modern versions of Microsoft Windows, including support for 64-bit processing architectures.

## ***User Interface***

While very functional, the PQView 3 user interface (UI) has a twenty-year history, and in places appears cluttered and unintuitive. For PQView 4, the UI will be reengineered to improve ease of use and consistency. The PQView 3 user interface and controls appear dated in their look and feel; PQView 4 will provide a fresh, modern interface. The current user interface is monolithic from the perspective of functionality and layering; the PQView 4 user interface will be more layered and modular, facilitating consistency, flexibility, maintainability, and extensibility. A powerful, highly interactive PQView 4 user interface will be available via a lightweight deployment and update option, extending application reach and ease of use, and greatly facilitating maintainability. In addition, specific types of functionality will have significantly enhanced visualization capabilities. For example, fault location modules will provide integrated, interactive GIS map and aerial imagery to expedite fault understanding and remediation.

## ***Data Federation and Enhanced Integration***

For the most part, PQView 3 only analyzes and reports on data that has been imported into a PQView database. Additionally, a single instance of PQView 3 can work only with one PQView database at a time. However, there is a growing need to integrate the power systems measurements imported into a PQView database with large external data stores such as SCADA systems, data historians, and more. Integration of all of these data stores is important in order to provide a comprehensive solution for analyzing all of the assets needed to ensure reliable grid operations. Importing this data for each prognostic analysis is not efficient because it duplicates a massive database.

PQView 4 will add support for a generic model for “federating” with external data stores. This functionality will allow a user to access data from one or more supported external data stores without first moving that data into a local PQView database; PQView will present the user with a unified view of the federated stores. Since each constituent data store remains autonomous, such a federated data system is an attractive alternative to the daunting task of merging together several disparate data stores. An example of a federated system would be if one or more native PQView databases are combined with a SCADA database or an OMS database that could be accessed simultaneously using the same PQView 4 domain model. A single PQView 4 instance will be able to access data from both integrated and federated data stores, including multiple PQView databases.

### ***Enterprise-Class Features and Performance***

Although PQView 3 stores its power systems measurements in a powerful SQL Server 2005 or 2008 database system, its data management module runs a single-threaded, desktop application. PQView 3 does not utilize well-proven, more-robust modules such as Windows services, which are better for enterprise-class processes. Instead, imports occur within an interactive process, mostly without failure recovery. Although in many cases importing has been optimized, PQView 3 instances poll their data sources, rather than being driven by events such as the availability of new electric systems faults or feeder energizing transients. Single, database-wide locking makes portions of all data import occur serially. PQView 3 does not have generalized, multi-threaded, multiple processor, multiple machine high scalability and availability features to process instantaneous work load as part of its architecture. Web versions of PQView do not have provisions to support multiple web servers, which is needed for scalability and availability. The lack of a service-oriented architecture limits integration of PQView into an enterprise environment.

Key goals of PQView 4 will be to embrace key enterprise-class server features to improve performance and availability. Its architecture will support reliable, long-running, recoverable, unattended data import and server processing. It will have the built-in processing ability to effectively utilize multiple threads, processors, and machines to distribute and handle dynamic work load. Its architecture will support high availability operation, allowing the automatic shift of workload to currently available systems. PQView 4 will provide modularized processing pipelines to durably do more work in parallel, allowing modules to be distributed to multiple computers. PQView 4 will make better use of cached precomputed values such as reliability indices, voltage sag indices, transformer or capacitor diagnostics, and fault event details. It will provide stateless, well-factored services to clients where possible to allow services to most effectively scale, and allow for more enterprise integration scenarios. Many of these enterprise enhancements are critical components for enhancing electric system reliability, since a reliable system requires reliable prognostics and diagnostics. Furthermore, as more distributed sensors are added to the monitoring system, high scalability will become more critical for system operation.

### ***Improved Standards Support***

PQView 3 currently allows integration with smart grid standards including IEEE 1159.3 PQDIF and IEEE C37.111 COMTRADE. It also offers indirect integration with open industry standards such as Modbus. PQView 4 will have deeper, better-aligned integration with numerous industry standards; such as IEC 61970 Common Information Model (CIM), MultiSpeak for Distribution Modeling, IEC 61968 Information Exchange between Distribution Systems, and IEC 61850 Electrical Substation Automation. PQView 4 will offer real-time and historical data exchange via OPC. Software standards such as WSDL, SOAP, WS-\*, and XML will be key to service-oriented systems. Integration with some of these standards will require redefinition of the domain model used by PQView itself. Embracing such standards will greatly facilitate the much needed interoperability that the smart grid objectives demand.

### ***Richer, .NET-Based Developer Framework/Software Development Kit***

The PQView 3 architecture allows third-party software development using ActiveX libraries and Component Object Model (COM) interfaces. Some third-party developers also directly query a PQView database using SQL statements. PQView 4 will be built on a “PQView platform” that uses the .NET framework and concepts such service orientation, loose coupling, and modularization. Much of the same framework will be exposed and available in the form of a .NET-based developer framework/Software Development Kit (SDK). Additionally, since many server-focused modules will be packaged as services that will be surfaced as XML web services, they will be accessible using many tools that can work with XML web services, even when not using .NET. The resulting PQView 4 platform will provide an extensible framework for building additional advanced applications for both proactively maintaining the grid and responding to failures.

### ***Security***

PQView 3 supports a certain degree of database-level authorization support when used with SQL Server, which can use SQL Server or Windows authentication. It supports file-based authorization when used with Microsoft Access. PQView web applications support a custom role-based authorization mechanism using Basic and Windows authentication.

PQView 4 will move to a capability/role based user authorization scheme implemented at the service layer. It will function and provide security independently of any database-based security mechanisms, providing access consistently, even across federated data stores. By leveraging the power of .NET’s Windows Communication Foundation (WCF), PQView 4 should be able to provide flexible and powerful security functionality

### ***Prognostic Health Management and Distribution Sensing using PQView 4***

The sensors that can be integrated by PQView monitor the equipment critical to ensuring electric system reliability, including transformers, switchgear and feeders. PQView 4’s enhanced enterprise features will allow it to reliably scale to collect and efficiently process the even larger volumes of data that come with extended distribution system sensing. PQView 4’s added support for both distribution system interoperability standards such as IEC 61850 and enhanced security

will securely extend its reach further into areas critical for improving grid reliability, efficiency, and security. The algorithms developed for PQView 3 will be migrated to PQView 4 and will be enhanced and extended. These algorithms and applications focus on monitoring grid assets for signatures of forthcoming failure, such as self-clearing and intermittent faults, unbalanced regulator operation, unbalanced reactive power delivered by capacitors, incorrect regulator setting based on load level, detection of tap changer degradation, and abnormal switching of circuit breakers. The PQView 4 platform is being designed to be an open system that will allow other companies to design their own asset diagnostic and prognostic applications using open, documented software development kits.

**Alternatives:**

Remains “As Is” and continue to maintain PQView 3.

**Risk of No Action:**

The current PQView 3 platform was developed 20 years ago. Characteristics of the system such as the database structure, user interface, scalability, inability to acquire data directly from intelligent electronic devices, and security concerns will make the system more and more difficult to maintain. Meanwhile the number of devices from which it will have to manage and analyze data for automation, decision support and engineering analysis will continue to increase. Not upgrading the PQView 3 system will put at risk the ability to support such basic applications as the reactance to fault for feeder fault processing, automated inrush detection, bus fault/trip out analysis, and the voltage regulation statistical process control analysis which is supporting Conservation Voltage Optimization Pilot.

**Summary of Benefits (financial and non-financial):**

Benefits include the long term ability to handle increasing numbers of intelligent electronic devices while sustaining:

- Reactance to Fault Analysis by PQView (Reduces Fault Locating time, especially in the critical summer period)
  - Fault Locating Accuracy approaching 80% within 1-3 manholes
  - Fault Locating time trending to 50% of values before RTF introduced
  - Key factor in reducing feeder processing time and cascading network event risk
- Automated inrush detection (allows rapid restoration of CIOA feeders which are not faulted)
  - 45 CIOA Feeders restored promptly after PQView detected and analyzed inrush currents in 2009 and 2010. (Attachment 3 -, data presented to operators via email notifications and the HUD system.) This represents savings of approximately \$1.125M annually in avoided repairs.
  - Key factor in reducing feeder outage time and cascading network event risk. (Harder to quantify but no less valuable.)
- Incipient fault detection on underground and overhead circuits ( will allow proactive repairs on the distribution feeder)
- Transmission Event DFR analysis and automated notifications

- Bus Section Trip Out/Bus fault correlation analysis and decision support
- Asset Management applications for transformers, breakers, capacitor banks and other equipment
- Statistical Process Control Analysis to support optimized voltage regulation at area substations
  - Conservation voltage optimization which has the potential for over \$100M in annual energy savings

**Project Relationships (if applicable):**

- Smart Grid Investment and Demonstration Grants
- Electric Control Center Upgrade project.
- PQNode System Upgrade

**EH&S Overview:**

**Analysis of prior year funding request versus actual:**

**Data Reports issued that support program:**

**Specifications & procedures pertaining to Program/Project:**

Various control center applications and systems including portions of HUD, VDIS, FMS, and operating procedures including EO-4095.

**Is this a mandated program? If yes, include verbiage associated with mandate:**

**Funding Forecast (Capital or O&M)**

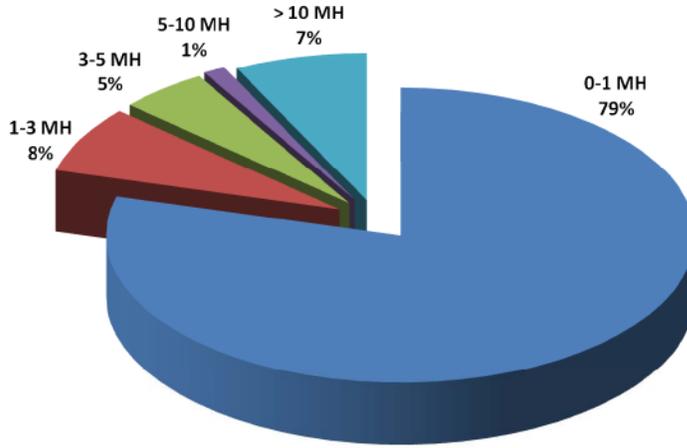
Actual 2008	Actual 2009	Actual 2010

	2011 CWE	2012 Request	2013 Request	2014 Request	2015 Request	2016 Request	5 yr (12-16)
Funding (\$000s)		650	950	1,150			2,750

## Attachment 1

Summer 2010 Manhattan RTF Accuracy and 2006-2010 Feeders Processing Trends Highlighting Reductions in Feeder Fault Location Time Since 2006

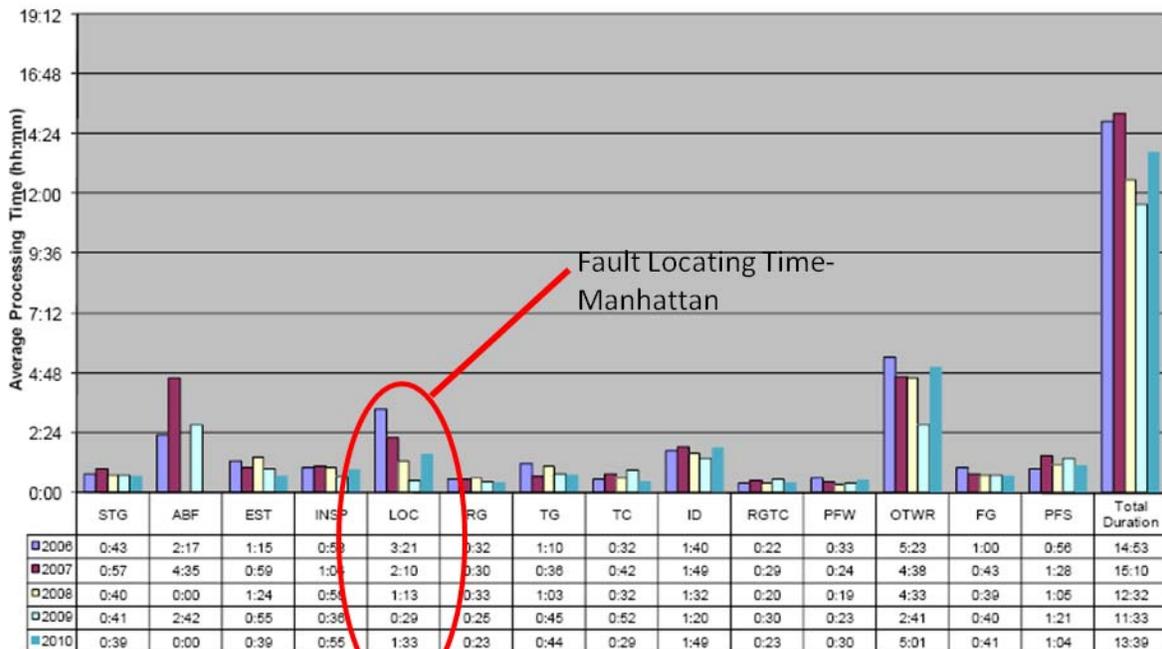
**Manhattan RTF Performance  
Summer 2010 (June 1st - August 31st)**



### Feeder Processing Steps

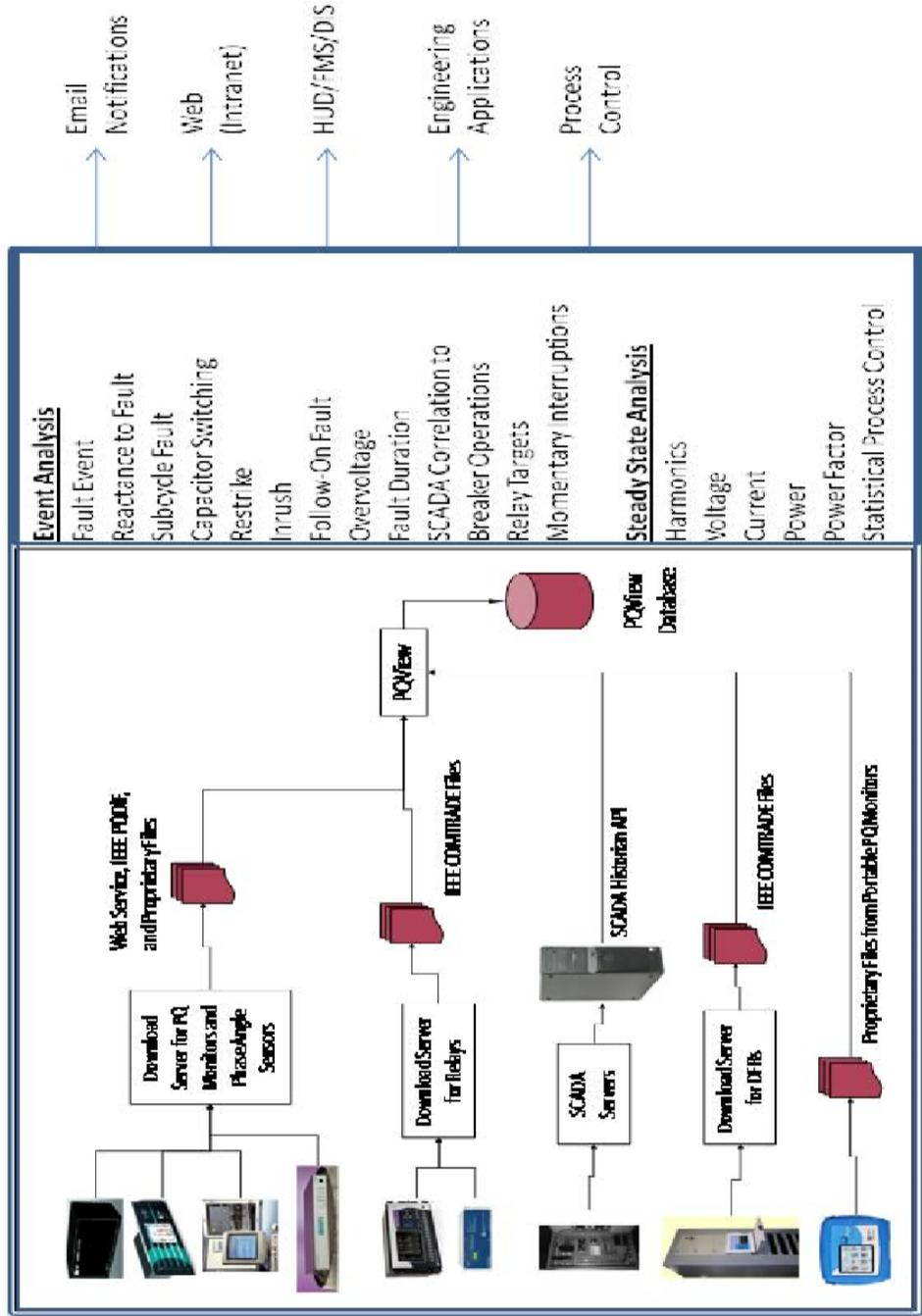
2006 to 2010

Feeder Failures on days with a Temperature Variable  $\geq 82$



**Attachment 2**

**Simplified Diagram of Con Edison systems showing relationship between electronic devices and SCADA (PI), and PQView 3 which provides event and steady state analysis, and functionalities supported for end users**



### Attachment 3

#### 2009 and 2010 CIOA Feeders Restored after Inrush Conditions (non- fault) were analyzed by PQView

2009 Data										2010 Data														
2M41	CIOA	Closed	West 110th St. # 1	HARLEM	12-15-2009	23:49	12-16-2009	02:13	12-15-2009	23:49	33R08	CIOA	Closed	Fresh Kills	33/13kV	01-05-2010	17:09	01-05-2010	19:03	01-05-2010	17:09	<a href="#">Details</a>	non Fault	
6M42	CIOA	Closed	East 29th St.	SQUARE	12-09-2009	13:21	12-09-2009	15:55	12-09-2009	13:21	1B56	CIOA	Closed	Plymouth h St.	BORO HALL	01-22-2010	12:52	01-22-2010	13:17	01-22-2010	12:53	<a href="#">Details</a>	non Fault	
2M41	CIOA	Closed	West 110th St. # 1	HARLEM	10-18-2009	07:22	10-18-2009	12:55	10-18-2009	07:22	1B56	CIOA	Closed	Plymouth h St.	BORO HALL	01-22-2010	13:18	01-22-2010	14:13	01-22-2010	13:17	<a href="#">Details</a>	non Fault	
2M41	CIOA	Closed	West 110th St. # 1	HARLEM	10-18-2009	05:38	10-18-2009	07:22	10-18-2009	05:38	1Q21	CIOA	Closed	North Queens # 1	ISLAND CITY	02-10-2010	21:50	02-10-2010	22:11	02-10-2010	21:50	<a href="#">Details</a>	non Fault	
23M59	CIOA	Closed	West 65th St.	LINCOLN SQUARE	06-13-2009	14:19	06-13-2009	16:38	06-13-2009	14:33	6M38	CIOA	Closed	East 29th St.	MADISO SQUARE	02-16-2010	05:23	02-16-2010	06:13	02-16-2010	05:26	<a href="#">Details</a>	non Fault	
7M56	CIOA	Closed	Avenue A	COOPER SQUARE	04-06-2009	17:17	04-06-2009	18:17	04-06-2009	17:31	1B65	CIOA	Closed	Plymouth h St.	BORO HALL	03-27-2010	23:06	03-27-2010	23:17	03-27-2010	23:05	<a href="#">Details</a>	non Fault	
7M56	CIOA	Closed	Avenue A	COOPER SQUARE	04-06-2009	15:46	04-06-2009	17:31	04-06-2009	16:29	1B65	CIOA	Closed	Plymouth h St.	BORO HALL	03-27-2010	23:18	03-28-2010	02:54	03-27-2010	23:18	<a href="#">Details</a>	non Fault	
4M67	CIOA	Closed	East 40th St. # 1	GRAND CENTRAL	01-31-2009	22:54	02-01-2009	00:54	01-31-2009	22:54	8B84	CIOA	Closed	Greenwo od 27kV -	BAYRIDG E NWK	04-03-2010	11:14	04-03-2010	11:21	04-03-2010	11:14	<a href="#">Details</a>	non Fault	
9B10	CIOA	Closed	Brownsvi lle # 2	RICHMO ND HILL	12-31-2009	21:18	01-01-2010	04:01	12-31-2009	21:20	1B93	CIOA	Closed	Plymouth h St.	BORO HALL	04-21-2010	22:06	04-21-2010	01:30	04-21-2010	22:06	<a href="#">Details</a>	non Fault	
8B87	CIOA	Closed	Greenwo od 27kV -	BAYRIDG E NWK	12-07-2009	17:15	12-07-2009	23:11	12-07-2009	17:17	2M41	CIOA	Closed	West 110th St. # 1	HARLEM	05-30-2010	15:33	05-30-2010	16:44	05-30-2010	15:35	<a href="#">Details</a>	non Fault	
1B52	CIOA	Closed	Plymouth h St.	BORO HALL	11-26-2009	01:48	11-26-2009	05:54	11-26-2009	01:48	8B80	CIOA	Closed	Greenwo od 27kV -	BAYRIDG E NWK	06-06-2010	03:31	06-06-2010	04:31	06-06-2010	03:31	<a href="#">Details</a>	non Fault	
8B80	CIOA	Closed	Greenwo od 27kV -	BAYRIDG E NWK	09-07-2009	04:42	09-07-2009	05:22	09-07-2009	04:41	8B90	CIOA	Closed	Greenwo od 27kV -	BAYRIDG E NWK	06-08-2010	04:42	06-08-2010	05:22	06-08-2010	04:41	<a href="#">Details</a>	non Fault	
6B44	CIOA	Closed	WILLIAM Water St.	SBURG	08-21-2009	17:34	08-21-2009	17:47	08-21-2009	17:34	9B12	CIOA	Closed	Brownsvi lle # 2	RICHMO ND HILL	06-22-2010	18:51	06-22-2010	19:29	06-22-2010	18:52	<a href="#">Details</a>	non Fault	
2B09	CIOA	Closed	Greenwo od 27kV -	PARK SLOPE	08-19-2009	18:28	08-19-2009	18:49	08-19-2009	18:34	9B09	CIOA	Closed	Brownsvi lle # 2	RICHMO ND HILL	06-22-2010	15:54	06-22-2010	16:21	06-22-2010	15:53	<a href="#">Details</a>	non Fault	
6B44	CIOA	Closed	WILLIAM Water St.	SBURG	07-05-2009	21:30	07-05-2009	21:35	07-05-2009	21:29	25M41	CIOA	Closed	East 63rd St. # 2	TURTLE BAY	07-28-2010	05:52	07-28-2010	07:05			<a href="#">Details</a>	non Fault	
8B90	CIOA	Closed	Greenwo od 27kV -	BAYRIDG E NWK	06-24-2009	00:22	06-24-2009	01:01	06-24-2009	00:23	6M31	CIOA	Closed	East 29th St.	MADISO SQUARE	10-25-2010	11:46	10-25-2010	12:14	10-25-2010	11:47	<a href="#">Details</a>	non Fault	
1Q14	CIOA	Closed	North Queens # 1	ISLAND CITY	05-06-2009	18:19	05-06-2009	18:54			10B67	CIOA	Cut In	Bensonhurst # 1	SHEEPSH EAD BAY	11-22-2010	03:00	11-22-2010	10:41	11-22-2010	02:59	<a href="#">Details</a>	non Fault	
9B12	CIOA	Closed	Brownsvi lle # 2	RICHMO ND HILL	04-25-2009	00:21			04-25-2009	00:21	2B91	CIOA	Closed	Greenwo od 27kV -		12-15-2010	03:37	12-15-2010	12:45	12-15-2010	03:37	<a href="#">Details</a>	non Fault	
1B56	CIOA	Closed	Plymouth h St.	BORO HALL	03-03-2009	22:48	03-04-2009	14:40	03-03-2009	22:59	2B91	CIOA	Closed	Greenwo od 27kV -		12-15-2010	11:58	12-16-2010	14:02	12-15-2010	12:45	<a href="#">Details</a>	non Fault	
5Q42	CIOA	Closed	Jamaica 127kV	JAMAICA NWK	01-13-2009	11:21	01-13-2009	12:25	01-13-2009	11:21	2B91	CIOA	Closed	Greenwo od 27kV -		12-16-2010	14:02	12-18-2010	07:59	12-16-2010	14:02	<a href="#">Details</a>	non Fault	
7Q66	CIOA	Closed	Corona # 127kV	FLUSHIN G NWK	01-10-2009	08:44	01-11-2009	10:38	01-10-2009	08:44	5Q30	CIOA	Closed	Jamaica 127kV	JAMAICA NWK	2010	18:54	2010	22:16	2010	18:54	<a href="#">Details</a>	non Fault	
7Q66	CIOA	Closed	Corona # 127kV	FLUSHIN G NWK	01-10-2009	05:06	01-10-2009	08:44	01-10-2009	05:06	5Q30	CIOA	Closed	Jamaica 127kV	JAMAICA NWK	2010	02:18	2010	03:03	2010	02:20	<a href="#">Details</a>	non Fault	
7Q66	CIOA	Closed	Corona # 127kV	FLUSHIN G NWK	01-10-2009	03:49	01-10-2009	05:04	01-10-2009	03:54														

## 2012 Capital – Electrical Operations

<b>Project/Program Title</b>	System Enhancements to Support Conservation Voltage Optimization
<b>Project Manager</b>	Elie Chebli
<b>Project Engineer</b>	Chris Comack, Leeman Hong
<b>Status</b>	Engineering
<b>Estimated Service Date</b>	2013
<b>Work Plan Category</b>	Strategic IT Enhancements, System and Component Performance

**Work Description (Includes units per Year and a high level schedule):**

Con Edison is currently conducting a pilot program designed to gain experience in operating our network distribution system in a Conservation Voltage Optimization (CVO) mode to reduce real and reactive energy supplied to and consumed by customers, and to decrease demand as well. This pilot encompasses four major areas of focus including:

- Voltage Control Methods and Optimization, including statistical process control techniques
- Energy and Demand Savings Measurement
- System Testing and Modeling
- Economic Analysis

As of June 2011, the CVO pilot has been successfully implemented in nine (9) area substation and eleven (11) networks as follows. The area substation listing is followed by the respective networks in ( ):

- Bruckner (West Bronx and Randall’s Island)
- Astor (Herald Square)
- Hell Gate (Yorkville)
- East 29th Street (Madison Square)
- Plymouth Street (Boro Hall)
- Seaport #2 (Fulton)
- Seaport #1 (Bowling Green and Cortlandt)
- Cherry Street (City Hall)
- Mott Haven (Central Bronx)

Preliminary results from the pilot group using several energy and demand savings measurement approaches indicate an aggregate energy savings of 1.94% to 2.19% (Attachment 1). Extending the measured savings from the pilot to the system, using the 2010 system energy delivered as a basis, gives a range of savings of between 1,140 GWhrs and 1,290 GWhrs annually (Attachments 2 & 3). Using the range of the monthly supply charge over the last six years for large commercial customers (\$85/MWhr to \$140/MWhr) gives an energy supply cost savings range of \$97M to \$180M per year. In addition, the program will most likely generate further customer savings due to reduction in reactive power usage. Also, efforts are underway in a collaborative effort with NYU/Poly to test customer end use equipment, field survey various customer facilities in different rate classes to catalog equipment usage, and update our PVL models with the objective of having an 8760Hr/Year model for CVO energy savings. Another effort of the pilot in addition to quantifying the economic savings for our customers would be to calculate the environmental benefits such as carbon footprint and greenhouse gas reductions achieved by implementation of CVO. First order estimates range between 350,000 and 400,000 metric tons of carbon per year.

It is envisioned that the pilot, which will run through the end of 2011 will be successful. Full scale deployment of CVO will require the following enhancements to the system:

- Deployment of statistical process control systems for area substation voltage regulation and other automated reporting systems
- Installation of end of line monitors in the secondary distribution network and overhead system. Data supplied by these monitors and process control systems are necessary to assure proper delivery voltage to our customers.
- Selected upgrades to local voltage control equipment at area substations which are identified by the process control system as candidates for upgrade, and upgrades to the computer programs performing Voltage/Var Control.

**Justification (Technical Evaluation/Analysis):**

Electric utilities (Con Ed included) typically deliver more voltage than customers need, to ensure that the customer at the very end of the distribution line gets enough. There are many reasons in history for this practice, but in general and as is the case here, supply voltage can be reduced and still be within the range for providing safe and reliable service. Generally, power consumption varies linearly with supply voltage, i.e. higher voltage results in higher consumption. In this CVO program, voltage optimization is achieved through the operation of substation voltage regulators in order to regulate the voltage at specific end of line points within a prescribed range. In this way annual energy consumption is reduced as is peak demand. Implementation of CVO calls for an average reduction of 2.25% to the bus voltage regulation schedules which are applied via engineering standards to the Voltage Var Control system in the Energy Management System (EMS). Additionally, settings are applied locally at area substation power transformer Contact Making Voltmeter (CMVM) controls. The CMVM provides transformer voltage control when the voltage cannot be controlled from the EMS. It is critical to providing adequate customer supply voltage via CVO that a system be developed which will properly identify times at which the voltage regulation goes “out of control” so that that these excursions can be tracked down, and the root causes identified and corrected. Three process control variables have been identified which are key to maintaining control:

- Deviation from scheduled voltage – which will be tracked against an upper and lower control limit
- MVAR range – out of balance of reactive power flows among area substation banks which will be tracked against an upper control limit
- Tap Range – maximum spread of taps among transformer banks in service which will be tracked against an upper control limit

The control limits will be designed to identify times when the voltage regulation process is “out of control”. This will help identify design, maintenance or operational issues with the system so that corrective action may be taken. It is likely that some transformer CMVM and other equipment at substations will exhibit control issues which cannot be addressed via normal maintenance and will need to be addressed by upgrading the local control system.

Presently, data to help validate the voltage regulation process are available from existing substation monitoring, and from “masterpoint” and other transformer secondary buses in the network. This project will also select representative locations in each low voltage network which represent the electrical “end of line” and install a high resolution monitoring device to monitor voltage regulation impacts down through the secondary mains and to the service conductor level. Similar monitoring will be installed at the “end of line” locations on the overhead system.

These enhancements are required to support full scale deployment of CVO in an efficient manner, realize the estimated MWhr and other savings described and sustain quality of service to customers.

**Alternatives:**

Remain as is

**Risk of No Action:**

The risk of not implementing these system enhancements may result in CVO not being fully implemented in each of the distribution networks and load areas, and the potential energy conservation, customer bill savings and carbon and greenhouse gas reductions will not be achieved.

**Summary of Benefits (financial and non-financial):**

A range of estimated monthly supply charges has been determined by extension of the CVO pilot results. For a typical network (as an example Fulton Network), the estimated annual CVO energy savings is approximately 11,000 MWhr and 3,500 metric tons of carbon emissions. Using yearly average range of energy supply costs from 2005 to 2010, potential monthly supply charge savings for customers for this one network would range from \$940K to \$1.535M. System wide, the range of estimated savings for the customer monthly supply charges for energy ranges from \$97M to \$180M and annual carbon emission reductions from 350,000 to 400,000 metric tons annually. We expect additional savings from reduced reactive power demand and from other greenhouse gas reductions, but these have not been calculated.

**Project Relationships (if applicable):**

Electric Control Center Upgrade Project  
RMS Data Acquisition System  
High Tension Monitoring Data Acquisition System  
Heads Up Display  
Power Quality (PQ Nodes) System Upgrade  
PQView System Upgrade  
Unit Substation Automation

**EH&S Overview:**

Distribution system total carbon footprint is directly reduced by the estimated energy savings. This benefit has not yet been fully quantified.

**Analysis of prior year funding request versus actual:**

**Data Reports issued that support program:**

Some of the pilot data analysis is shown in the attachments and detailed analysis, presentations and supporting material is on the project sharepoint site:

<http://ceintranet/sites/electricops/DistEngineering/ConservationVoltageOptimization/Pages/default.aspx>

**Specifications & procedures pertaining to Program/Project:**

Voltage Var Control system, various substation feeder bus voltage and capacitor switching schedules, engineering procedures and instructions relating to CMVM operations, EO-2065 “Low Tension A.C. Service Voltage Limits”

**Is this a mandated program? If yes, include verbiage associated with mandate:**

**Funding Forecast (Capital or O&M)**

<b>Actual 2008</b>	<b>Actual 2009</b>	<b>Actual 2010</b>

	<b>2011 CWE</b>	<b>2012 Request</b>	<b>2013 Request</b>	<b>2014 Request</b>	<b>2015 Request</b>	<b>2016 Request</b>	<b>5 yr (12-16)</b>
<b>Funding (\$000s)</b>		500	500				1,000

## 2012 Capital - Facilities

<b>Project Name</b>	Astoria Outfall B (Consent Order)
<b>Project Number</b>	50578-09
<b>Work Plan Category</b>	Reg - Agency Mandated
<b>Priority</b>	
<b>Project Manager</b>	Leo Palmer * *
<b>Project Engineer</b>	Donald Azzolini
<b>Budget Reference</b>	TBD
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	

### Work Description:

Consolidated Edison prepared a work plan for the southwest storm water system to address the New York State Department of Environmental Conservation's (NYSDEC) proposed Consent Order requirement to submit a plan for repair or replacement of the Astoria storm sewer system associated with Outfall B. The system collects storm water from approximately 18 acres of the southwest portion of the Astoria, New York facility, and discharges to the East River via Outfall B. The system originates on Con Edison property, although the lower 800 feet of piping and Outfall B are located on US Power Gen's property. Some portions of the system are believed to have been constructed more than one hundred years ago. As the site developed and changed over time, portions of the storm water system were expanded while others were abandoned. Currently, the storm water system contains broken pipes and leaking plugged connections to abandoned pipes which allow groundwater to enter the system and cause a steady flow of approximately 30 gallons per minute (gpm). On February 26, 2010, Con Edison submitted to the NYSDEC an engineering report for installation of a 100 gpm dry weather discharge treatment system.

The following is provided regarding the condition and function of the southwest storm water system:

- The storm water system at one time included several more catch basins and pipes that have since been abandoned.
- The main trunk line contains cracked and plugged lateral connections that allow infiltration of groundwater.
- The existing pipe liner between MH5 and MH6 is sagging and is likely catching sediments and inhibiting flow in the system.
- The system is tidally influenced up to and beyond Con Edison's sampling location, MH 2.
- The existing pipes are undersized, and flooding (including localized ponding) is likely.
- Sediment collects in the storm water system.

Based on the existing condition analysis, the focus of improvements is on improving the drainage and conveyance of the system and providing opportunity for sediments and oil/grease to separate out from storm water

flow. It is recommended to replace the storm water pipes to eliminate groundwater infiltration, eliminate connections to abandoned systems, and reduce flooding. In the process of replacing these pipes, connections to existing structures would be replaced. Construction specifications will include requirements for water tight seals between pipes and structures. It is also recommended to upgrade the pipe size to reduce flooding during replacement.

**Solution from Project Appropriation:**

Remove the existing Astoria Outfall B system pipes, manholes and catch basins and replace with new corrugated (smooth interior) high-performance polypropylene pipes and associated concrete structures. Existing abandoned lateral branches of the drainage system will not be connected to the new pipe and will be cut and/or plugged in place. To mitigate ground water infiltration, the new drainage system will utilize double gasketed bell & spigot high performance piping connections; per appropriate ASTM standards extensive pipe testing will also be performed to insure water tightness. The drainage system will be outfitted with two oil/grit separators for catching and detention of accidental oil spills and contaminated runoff sediment and solids. The Outfall B replacement will begin after remediation of the yard north of the Transformer Shop has been completed to prevent the major source of PCBs in storm water runoff from entering the new pipe. It is anticipated that the NYS DEC will no longer require operation of a dry weather treatment system for Outfall B after the replacement storm sewer system is installed.

**Justification:**

Various inspections of the existing Astoria Outfall B storm water drainage system over the last decade identified dry weather water infiltration and numerous deteriorated sections of drainage pipes and structures. The most recent video inspections of internal surfaces of the drainage system confirmed that many pipes are actually cracked and most connections to the system's branches are leaking groundwater into the system. These inspections and subsequent engineering analysis also concluded that the existing pipes are undersized and that a potential for flooding is likely. Several attempts have been made in the past to locally repair the drainage system by applying an internal pipe lining but that method has failed; this has actually worsened the performance of the system as the repair materials have warped and partially blocked the pipe. In April, 2010 Con Edison entered into a NYS DEC Consent Order requiring the Company to install and operate a 100 gpm treatment system to treat groundwater infiltration and a small amount of storm water runoff. The Consent Order also required the Company to implement a NYS DEC approved work plan to replace/repair the Outfall B storm sewer system and to implement a NYS DEC-approved Best Management Practices to prevent sediments containing PCB from entering the storm sewer discharging at Outfall B.

This work is a requirement of the DEC Consent Order, Appendix A - Corrective Action Plan signed 4/21/2010 in order to eliminate ground water (which contains various contaminants including oil, PCB, cyanide) infiltration into the outfall B storm water conveyance system and thus the discharge of these contaminants into the East River.

- \* Alternatives: At this point there are no alternatives other than replacing the pipe as that was the scope of work agreed to in the above Consent Order.  
  
Construct a permanent water treatment facility for the Outfall B drainage system in order to comply with NYS DEC discharge requirements. The treatment facility construction will require a comparable time and cost but will not address the deteriorated drainage system piping condition. This alternative is not recommended.
- \* Risk of No Action: The above Consent Order and dates are enforceable. The projects 75% construction package was due and completed by 7/31/10 and the applications for the various permits were due and submitted by 8/31/10. The final construction package is due 2 months after receiving all regulatory agency comments and the construction package must be awarded 4 months from then. The contractor will submit a construction schedule 2 months after being awarded the contract.  
  
Note - This project will start after completion of the North Storage Yard Remediation project and thus construction will most likely begin around mid to late 2012. The consequence of not performing any action is potential fines associated with not meeting the dates established and committed to by the Company in this Consent Order.
- \* Non Financial Benefit Explanation: In addition to mitigating the environmental effects of conveying pollutants to the East River, this project address flooding and other issues associated with the operation of a 100 year old brick & clay based sewer system which is experiencing failures. Besides site flooding, breeches in the pipe are allowing water to escape from the system and wash away surrounding soil leading to sink holes, which have occurred most recently in heavily trafficked site roadways.
- \* Technical Evaluation and Analysis: Based on the existing condition analysis, the focus of improvements is on improving the drainage and conveyance of the system and providing opportunity for sediments and oil/grease to separate out from storm water flow. The storm water pipes and catch basins/manholes will be replaced to eliminate groundwater infiltration, eliminate connections to abandoned systems, and reduce flooding. In the process of replacing these pipes, connections to existing structures would be replaced. Construction specifications will include requirements for water tight seals between pipes and structures. It is also recommended to upgrade the pipe size to reduce flooding during replacement.
- \* Project Relationships: This project will affect operations on the site and movement of equipment such as spare transformers and also will affect Major Overhauls at US Power Gen.

**Current Status:** Specs/drawings have been developed by AECOM. The 100% design package and subsurface, watertable and groundwater investigation reports have been completed. Five large test pits were also constructed in 2011 in order to better identify any subsurface utilities/structures that may interfere with the construction of the Outfall B sewer system. These test pits allowed completion of the engineering design package.

**Current Working Estimate:** \$20,000,000.

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	534	7000	13000	0	0	0	0	0	20534

**Benefit: (\$000s)**

Benefits	2011	Total
	\$0	\$0

\* **2007 to 2011 Budget in Thousands-** \$534

\* **2012 to 2016 Budget in Thousands-** \$20,000

\* **Authorization-**

\* **Appropriation-**

Main project appropriated. \$500,000 appropriated in 2011 for test pits investigations in order to identify subsurface utilities.

\$534,000 was spent on the test pit investigations instead of the appropriated \$500,000, because the pits needed to be made wider in certain situations once subsurface utilities were discovered. Once discovered, the utilities could not be properly identified until a larger area was excavated. This information provided necessary and valuable input for engineering design.

Historical elements of expense (EOE's)

EOE	2007	2008	2009	2010	2011
Labor					\$10,680
M&S					
*A/P-Labor					\$523,320
Contingency					
<b>Total</b>					<b>\$534,000</b>

Forecast

EOE	Approved 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Approved/Forecast Total 2012-2016
Labor	\$350,000	\$650,000				\$1,000,000
M&S						
*A/P-Labor	\$6,650,000	\$12,350,000				\$19,000,000
Contingency						
<b>Total</b>	<b>\$7,000,000</b>	<b>\$13,000,000</b>				<b>\$20,000,000</b>

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

## 2012 Capital - Facilities

<b>Project Name</b>	Construction Relocation Build-outs for QB and Farrington Street Gowanus Trailers
<b>Project Number</b>	tbd
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Leo Palmer
<b>Project Engineer</b>	Donald Azzolini
<b>Budget Reference</b>	tbd
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	

### Work Description:

Facilities Engineering is currently working with Corporate Real Estate to review and determine suitable sites for relocating the Construction Department from the Queens Boulevard site and from existing trailers at Farrington Street and the Gowanus locations. The sites are currently being evaluated and test fits are being generated. None have been finalized at this point.

A lease is presently being negotiated to relocate the Queens Boulevard operations to 59-17 Junction Blvd, Queen. The fit up will include the demolition of existing space and the creation of newly renovated space suitable for the operations (including team/muster/conference rooms, storage space, printer and plotter areas and new furniture).

A lease is presently being negotiated to relocate the Gowanus Trailer operations to 788 Third Ave., Brooklyn. The fit up will include the demolition of existing space and the creation of newly renovated space suitable for the operations (including team/muster/conference rooms, and new furniture and also bathrooms and locker rooms for men/women).

The Farrington Street Trailer operation will be relocated to the Astoria Main Warehouse, requiring minor renovations to create the appropriate muster space. New lockers will be added to the existing locker rooms and existing bathrooms will be used.

### Justification:

The existing lease for the Queens Blvd location will be ending in the fall of 2012 and thus employees need to be relocated. The existing trailers at the Farrington Street and Gowanus locations are not permitted per the NYC Building Code and must be vacated as soon as suitable alternative facilities are fit up.

- \* Alternatives: None.
- \* Risk of No Action:
- \* Non Financial Benefit

Explanation:

- \* Technical Evaluation and Analysis:
- \* Project Relationships:

**Current Status:** In lease negotiation and design.

**Current Working Estimate:** Queen Boulevard Relocation ~ \$3,425,000  
Gowanus Trailer Relocation ~ \$1,200,000  
Farrington Trailer Relocation ~ \$ 375,000

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	2000	1000	0	0	0	0	0	0	3000

**Benefit: (\$000s)**

- \* **2007 to 2011 Budget in Thousands-** \$0
- \* **2012 to 2016 Budget in Thousands-** \$3,000
- \* **Authorization-**
- \* **Appropriation-** To be prepared.

Historical elements of expense (EOE's)

<b>EOE</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	
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					<b>2011</b>
Labor					
M&S					
*A/P-Labor					
Contingency					
<b>Total</b>					

Forecast

<b>EOE</b>	<b>Approved 2012</b>	<b>Forecast 2013</b>	<b>Forecast 2014</b>	<b>Forecast 2015</b>	<b>Forecast 2016</b>	<b>Approved/Forecast Total 2012-2016</b>
Labor	\$80,000	\$40,000				\$120,000
M&S						
*A/P-Labor	\$1,920,000	\$960,000				\$2,880,000
Contingency						
<b>Total</b>	<b>\$2,000,000</b>	<b>\$1,000,000</b>				<b>\$3,000,000</b>

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

<b>Project/Program Title</b>	Mapping Systems Replacement
<b>Status</b>	
<b>Estimated Service Date</b>	December 31, 2017

**Work Description:**

A GIS based mapping application will be purchased to replace existing mapping applications. Some of these mapping applications (VISION, Netmap, MAPS website) do not work without Microsoft’s Server 2003 operating system which is scheduled to be retired by Microsoft at the end of 2015. Microsoft has quoted a cost of \$1.6M for extended support for year 2015 and \$3.2M for 2016. After 2016, the price for extended support remains a variable but is estimated to be >\$5M for 2017. There are six core mapping applications dependant on this operating system used company wide that are described below:

1. Electric and Gas in multiple regions (VISION)
  - Electric Secondary mapping for Bronx, Westchester, Brooklyn, Manhattan and Queens
  - Gas for Bronx, Westchester, Manhattan and Queens
2. Conduit and Duct Occupancy Maps for Bronx, Westchester, Brooklyn, Manhattan and Queens
3. Staten Island Mapping for Electric Primary, Secondary and Conduit (EDFIS)
4. Feeder Mapping for Bronx, Westchester, Brooklyn, Queens, Manhattan, and Brooklyn (in progress)
5. Steam mapping (SOMIS)
6. Electric Transmission maps (currently AutoCAD drawings only in Metaphase)

This project willto be divided into two main phases. Phase one is a tactical project that will ensure business continuity. While it is not necessary to execute Phase two of the project, only business continuity will be accomplished in Phase 1, few business efficiencies will be gained unless Phase 2 is executed.

As part of phase one, we will address the high risk mapping softwares (VISION, Netmap, and the MAPS website) which will become unsupported or prohibitively expensive to support by 2015. A software vendor will be selected for the replacement and implementation of these high risk softwares. Completion of this phase is critical for business continuity.

The second phase of the project will focus on the long term goals and will be strategic towards achieving business benefits. This phase of the project will include evaluating and implementing an enterprise GIS solution. Implementing a GIS enterprise solution will help us achieve a common platform and landbase across divisions and commodities. Implementation plans will be defined to integrate engineering design, work across commodities, communication with external stakeholders, maps & records, and engineering analysis.

The overall project goal is to transition to a new GIS application, base map and design tools that will accommodate all mapping applications and functional requirements. An order of magnitude for this project is between \$75M to \$160M.

## **Justification:**

The mapping applications currently used by Electric Gas and Steam are dependent on Microsoft's two operating systems Server 2003 and XP. Microsoft has deemed that these operating systems have reached the end of their standard support and will cease to support them with patches and security updates. Current mapping applications are not upgradeable and not work with the replacement operating systems Server 2008 and Windows 7. In order to continue full mapping and design functionality beyond 2015, it is necessary to pay for extended support to Microsoft. The pricing schedule from Microsoft for extended support starts at \$1.6M, doubles for 2016, and is anticipated to be even greater for 2017. Replacing with software that is compatible with the new operating systems is the only solution other than paying for escalating extended support for the old software. Phase one of this project will address the immediate need of the business continuity past 2015. Some additional risks that must be evaluated before a final recommendation can be made include: licensing, compliance, performance, costs, full functionality and disaster recovery planning.

The known costs to support the six core mapping application exceeds \$4.1M annually and includes software licensing, labor, vendor services and special projects. There are 38 existing related applications. The current suite of mapping applications still limits the business units with a lack of functionality regarding the issues of multiple land bases, proprietary coordinates, integration, and capability easily exchange data with external stakeholders. This translates into inefficiencies and greater man-hours needed to issue work, where Phase two implementation offers the potential in business process improvements:

- 1) Data between these six core applications has limited interchangeability and displayability. When new assets are added to the system (i.e new electric manhole) current process is to record it multiple times including adding it to the M&S, C&DO and then the primary. Having all data on a standard platform, will simplify and reduce the time require to record new assets to the maps.
- 2) On a GIS platform with a single base map, the company can house all of its Electric including Transmission & Distribution, Gas, Steam and Telecommunications assets. The current mapping applications maintain multiple base maps and proprietary coordinates. The only way to share and map data across commodities is to do repeated data conversions. This makes it prohibitively time consuming to share data across commodities, between electric regions, within electric maps (C&DO, M&S and Primary maps) and with external stakeholders (city water & sewer and communications facilities).
- 3) A GIS system offers the functionality and features for identifying mapped assets to a specific geographic location in the field.
- 4) Establish standards for our 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.
- 5) Reduction in time and research needed issuing layouts adding any type of structure requiring street excavation.
- 6) 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.

- 7) A standard platform will enable the Company to share data with internal and external stakeholders. This has been difficult to do in the past because the data has been of limited usefulness due to proprietary coordinate systems, duplication of facilities on our maps and the efforts required to convert and maintain these coordinates. A significant time savings can be realized by having the functionality to display city water and sewer facilities and included on our layouts.
- 8) Emergency response will become more streamlined and reduce time and man-hours spent reacting to these events. During any type of natural disaster (hurricane, storm or flooding event) the company will quickly have the ability to locate assets in areas that the government tells us are in the affected areas. In addition, the company response to a company initiated emergency in one commodity or any city emergency (i.e water main break, building collapse or security issue) can be streamlined. The GIS platform will also allow for the quick identification of all company facilities in any of these affected areas.
- 9) Provide Logica Asset Management compatibility.

Within Electric Operations the following known issues within mapping require a resolution.

- 1) Existing data needs to be consolidated into a single data model, and data standards must be established and adopted across all operating regions.
- 2) Existing landbases must be replaced with spatially accurate base maps available from New York City and Westchester County; existing electric data must be registered to these base maps, inheriting “real-world” coordinates in the process.
- 3) Existing systems need to be replaced with contemporary technology, with an eye towards reducing the long-term cost of ownership.
- 4) Conduit maps currently reside in a raster format. These maps need to be converted to a digital format and referenced to a common base map.

### **Risk of no Action:**

Con Edison will not have a working mapping software past 2015 (VISON, Netmap, MAPS website) as Microsoft’s support for both Windows XP and Server 2003 will be ending. If we choose to continue and pay high maintenance costs, there will also be a lack of mapping strategy that leverages the current investment in work management which is supported on the most current computer operating systems. In the absence of direction, it is possible both time and money is spent in implementing a solution that will have no bearing on a GIS based mapping application solution and will have an extremely short production life to bridge the gap.

### **Summary of Benefits:**

Achieve business continuity for critical applications by 2015. Reduce risk of paying for Microsoft’s extended support for Server 2003. Price schedule runs the risk of volatility due to

obsolescence of the software and Microsoft's reluctance to continue supporting the product even when the company is willing to pay for an extended service agreement.

The Company will see efficiencies resulting from defining data and process standards and consolidation of software products. Business efficiencies include time to issue layouts, map updates and reconciliation of Edison facilities with external entities such as the City.

Offer greater flexibility in training and interchangeability of personnel working with existing multiple platforms.

Enhance company response and reduce time spent preparing for system emergencies and natural disasters.

**Estimated Completion Date:**

Phase one estimated completion date: June 30, 2015

Phase two estimated completion date: December 31, 2017

**Status:**

New Project, not yet initiated

**Funding (\$000)**

Forecast 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Forecast Total
2,500	31,500	31,500	31,500	31,500	31,500	160,000

## 2011 Capital – Business Unit/ Division

<b>Project/Program Title</b>	PowerPlan Provision System Implementation Phase II
<b>Priority Number</b>	
<b>Project Manager</b>	Joe DePiano, Finance/Tax Department
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC
<b>Project Number</b>	
<b>Status</b>	New
<b>Estimated Service Date</b>	2011
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	

### Work Description:

To perform the following PowerPlan Provision System Implementation Phase II functionality enhancements:

- **PowerTax Interface:** Configure the Integration between PowerTax and Provision,
- **Non-Regulated (CEI, Clove, ORDEVCO and RECO, LLC) Provision Implementation:** Convert, Integrate CR Mapping, Integrate GL Mapping, Verify and Test new company Non-Regulated in Provision and
- **InSource Interface:** Configure the interface between Provision and InSource

### Justification:

This process will (1) automate the depreciation entries from PowerTax to Tax Provision, (2) automate the Tax Provision and return interface and (3) automate the Tax Provision for the Non-Regulated businesses except for the Competitive Energy Businesses. With the implementation of PowerTax module, the Company's Tax Provision calculations will be fully automated thus increasing the tax processes and controls. This methodology includes pulling the data from PowerTax module into Provision and pulling the data from Provision into InSource for the return.

One of the key requirements for implementing the new methodology includes completion of deferred tax reconstruction and PowerTax conversion activities. At the time when tax provision team was re-baselining the project plan and schedule in March 2010, scheduled end dates for deferred tax reconstruction and PowerTax conversion were not confirmed. So, the tax provision team proceeded to implement the old methodology for tax provision calculations for January – August 2010 and deferred the introduction of new methodology to a later date after deployment in August 2010.

One of the key pre-requisites for implementing the new methodology would include completing and validating PowerTax conversion (including deferred tax reconstruction). This is part of the PowerPlant/PowerTax go-live activities planned during July and August 2010.

Implementing the new methodology would include the following steps –

- Complete the projection for future periods (including book depreciation for 2010 and beyond)

- Define, configure PowerTax to Tax Provision interface and pull data from PowerTax
- Define, configure Provision to InSource interface and pull data from Tax Provision
- Convert, Integrate CR Mapping, Integrate GL Mapping, Verify and Test new company Non-Regulated in Tax Provision
- Complete required calculations – reconcile results from the new methodology to results from the old methodology
- Deploy the new methodology in Production

This is estimated to take 8 – 10 weeks and would require support from PowerTax and Tax Provision consultants, IR, Tax and a Project Manager. The Project Manager would require about .5 FTE and additional ConEd resources would require 0.5 – 1 FTE from ConEd during this period.

Tax stakeholders would initiate this request and work with IR team to plan and execute this project using the IR ChangeTrac process.

- Alternatives/Risk of No Action:

Under the Case that this project is not pursued, the following risks would be applicable:

- Decreased control environments from manual calculations due to systems not interfacing,
- Decreased control environments related to Non-Regulated businesses manual tax calculations,
- Decreased accuracy in financial reporting related manual calculations and
- Inefficiencies related to timeliness of manual calculations.

- Non-financial Benefits (if applicable):

Under the Case that this project is completed, non-financial benefits include:

- Reduced audit risks through improved process and controls and
- Increased financial reporting accuracy.

- Technical Evaluation/Analysis:

These enhancements will improve the processes and controls of the overall provision process both at an individual business level and at a consolidations level. The PowerTax Provision Module calculates and records monthly tax liability, both current and deferred, and produces effective tax rate calculations as well as other reports and analysis. This involves both fixed assets related items and adjustments which are not related to fixed assets. The system has complete regulated and non-regulated capacity. The accrual process can accommodate multiple state tax jurisdictions and apportionments. The user can control all Schedule M processing and the determination of deferred taxes by M-item. Flexible routines perform estimates, spreads, and monthly true-ups. M-Items and monthly income amounts are linked directly from the general ledger, PowerTax, or other spreadsheets to simplify the monthly update process. The module accommodates multiple tax cases to simplify comparative analysis as well as the return-to-accrual true up. Income tax calculations are provided including regulatory asset and liability determination. Unlike most accrual systems, the PowerTax Provision module handles the requirements of companies who have regulated business segments and the associated deferred tax requirements.

- Project Relationships (if applicable):

The CEI implementation will improve the overall provision process for both the individual businesses and the CEI consolidations process. The implementation will also facilitate accuracy and completeness of both the regulatory and financial reporting requirements.

**Estimated Completion Date:**

Commencement of analysis work in 2010. This program is not dependent on any other software project in other proceedings. The project is scheduled for completion by February 28, 2011, with the roll-out in the first quarter of 2011.

**Status:** Not started.

**Current Working Estimate (if applicable):** Not Applicable.

**Funding: (\$000s)**

	Request 2010	Request 2011	Request 2012	Request 2013	Request Total
		200,000			

## 2012 Capital – Business Unit/ Division

<b>Project/Program Title</b>	ALLOC – Allocation and Demand Analysis
<b>Priority Number</b>	
<b>Project Manager</b>	Patricia Valente
<b>Project Engineer</b>	
<b>Budget Reference</b>	0XC1700
<b>Project Number</b>	
<b>Status</b>	
<b>Estimated Service Date</b>	2012
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	

### **Work Description:**

The Demand Analysis, like its companion Embedded Cost of Service Study, is submitted as a rate case exhibit as part of each rate filing. The Demand Analysis report presents a detailed disaggregation of system peak responsibility by service classification using 5 summer and winter peak day averages which forms the basis for allocation of various company operating costs and rate base items in the Embedded Cost of Service (ECOS) study.

ALLOC is a replacement of, Computer Electric Demand Study system (COEDS), which can not accommodate the 8,760 hour output of the DLS (Dynamic Load Shaping) system, a format that is critical to load and rate analysis and other energy pricing and management studies. In its current form, COEDS is inflexible both as an analyses tool and as a report-writer. Without significant effort by staff, it can no longer meet the growing number of rate case filings and the pressures for more flexibility and scenario analyses required for rate case support.

The total project cost is \$400K.

### **Justification:**

- **Alternatives/Risk of No Action:**

COEDS has two primary functions – balancing and extrapolating class and strata load shapes to system levels for representative winter and summer peak days and a report writer which summarizes the class data by season. The last pages contain a short report containing class allocation strings (thus the name) used in disaggregating various system costs and expenses in the ECOS.

COEDS, which went into production in late 1984, requires an 80 position card wrap-around format for its input. Each class and strata require manual inputs of 48 6-decimal numbers for each half-hour in a seasonal one day load shape. These and other manual inputs involving system shapes and other adjustments to sales, make any scenario analysis arduous and time-consuming. Prior attempts at modifications – including a direct feed from the LSS (Load Study System) which has been replaced by DLS, required significant reprogramming efforts.

No action will just put increased pressure on limited staffing to do repetitive inputs and checking. New staff find the repetitive clerical punch card-format inputs burdensome, error-prone and demotivating.

- **Non-financial Benefits (if applicable):**

The need for 8760 hour data for rate design support (Case E-0523) and settlement shapes at the customer's meter have been addressed by DLS. ALLOC will take these electronic outputs as its input and complete the disaggregation analysis for rate case support. By expanding and allowing for flexibility in input data flows from existing systems, it will also expand its scenario analysis capability by adding other variables like zonal shapes in the disaggregation of loads.

The Demand Analysis report is limited by its source code (RAMIS, Cobol). It is inflexible with fixed formats, limited descriptive text and non-user friendly non-consecutive page numbering (report numbering restarts within sections).

While the analysis benefits and rate case support do not easily fit into evaluation guidelines, any improvement in analysis of disaggregation of costing ultimately improves the customer satisfaction and the competitiveness of our pricing of our services and our financial wellbeing.

- **Technical Evaluation/Analysis:**

Because of programming effort required and the limitations of the underlying code, interim modifications were delayed pending completion of the LSS replacement and better understanding of 8,760 hour analysis requirements.

Although the requirements analyses have not been completed, the possibility of expanding the Dynamic Load Shaping to include one or more SAS-based software modules will be considered as an alternative to any in-house development plan.

- **Project Relationships (if applicable):**

Other changes of inputs to DLS like the rewrite of Rate Engineering and System Planning Integrated System (RESPIN) and the phase-in of Meter Data Management System functionality will enhance ALLOC functionality.

Estimated Completion Date: 2012

**Status:**

Not started

**Current Working Estimate (if applicable):**

**Funding: (\$000s)**

Request 2012	Request 2013	Request 2014	Request 2015	Request 2016	Request Total
400					400

## 2012 Capital – Business Unit/ Division

<b>Project/Program Title</b>	Oracle Hyperion Disclosure Management (XBRL)
<b>Priority Number</b>	
<b>Project Manager</b>	Joseph Miller/Joseph Cunha
<b>Project Engineer</b>	
<b>Budget Reference</b>	MXC1500
<b>Project Number</b>	None
<b>Status</b>	Vendor Selection
<b>Estimated Service Date</b>	2014
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	

**Work Description:** With increasing frequency and complexity in SEC reporting requirements, the Financial Reporting Section has been investigating platforms to manage and record the entire financial reporting process from period close to SEC filing. A requirement that has hastened the importance of this investigation is the filing of interactive financial data or extensible business reporting language (XBRL).

XBRL is an international information format standard designed to help investors and analysts find, understand, and compare financial and non-financial information by making this information machine-readable. This means giving investors quicker access to the information they want in a form that is easily used. Its goal is to enable companies to better control how their financial and non-financial information is presented and disseminated and reduce reporting costs by integrating their operating data with their financial reporting disclosure.

XBRL is a computer language, which uses standardized eXtensible Markup Language (XML) technology and permits the automation of what are now largely manual steps for access, validation, analysis, and reporting of disclosure. XBRL uses standardized definitions of terms. The standardized terms are then arranged in a logical structure called a taxonomy. A GAAP financial statement itself, in that its underlying details are summarized in the line items of a balance sheet is a taxonomy.

FRS's current process is to have the Company's filing agent, RR Donnelly translate financial statements and footnotes into this XML technology and submit the document with the regular SEC EDGAR filing. The review process is time consuming and any last minute changes from Audit Committee discussions can delay a scheduled filing.

By implementing a platform (including an XBRL module) to manage the reporting process, FRS can better control the document and any changes that need to be made to the filing as it gets closer to its scheduled date. It would allow users to enter data, report and interactively analyze information using the Microsoft Suite. It can also provide an end-user reporting tool with highly formatted, production quality reports in either HTML or Pdf.

### **Justification:**

- **Alternatives:** In the absence of a Disclosure Management platform, more manual review and hands-on activity is required.
- **Risk of No Action:** The risk of no action is a manual error in an SEC filing or a filing delay necessitated by a late XBRL change that cannot be processed quickly.
- **Summary of Financial Benefits and Costs:** TBD

- Non-financial Benefits (if applicable): Mitigates financial reporting risk; Ownership control of document enhances confidentiality and filing times.
- Technical Evaluation/Analysis: Integration with the new Oracle financial reporting tools
- Sensitivity Analysis (if applicable):
- Project Relationships (if applicable):

**Estimated Completion Date:** December 2013

**Status:** Reviewing Oracle product, which is new. FRS is waiting to see real world experience from other customers.

**Current Working Estimate (if applicable):**

Oracle Disclosure Management License:	\$81,000
Integrator (4 weeks @ \$325/hour)	52,000
Integrator expenses (25%)	13,000
Hardware fees/server	37,000
IR Support (4 weeks)	14,400
1 <sup>st</sup> year Training and Support	18,000
Miscellaneous (10%)	<u>22,000</u>
Implementation	\$237,400 or \$250,000 rounded

\*\*This Capital project was originally planned for 2012 but because of the implementation of the Finance and Supply Chain (Project One) System, this project has been deferred to 2014.

**Funding (\$000):**

Forecast 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Request Total 2012-2016
-	-	250-	-	-	250

- **Authorization -**
- **Appropriation -**

## 2010 Capital – Business Unit/ Division

<b>Project/Program Title</b>	Gas Rate Design and Analysis Systems (GAS CUS)
<b>Priority Number</b>	
<b>Project Manager</b>	Pat Valente / Steve Brennan
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9804
<b>Project Number</b>	
<b>Status</b>	Started
<b>Estimated Service Date</b>	2013
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	

### **Work Description:**

The RESPIN system is an updated version of a database originally created in response to special requirements of Rate Engineering and Energy Management/Forecasting, previously titled System Planning, for rate case and tailored customer usage analysis between rate cases. As this database was an extract from the CIS billing system, RESPIN included both electric and gas system versions.

Unique to RESPIN is the “snapshot” point in time extract of customer information from CIS that provides flexibility to do scenario analysis and also contains complex logic for aligning sales to time periods that would be too cumbersome to recreate on a query by query basis. This system also meets the need for data consistency for load research and rate design analysis from rate case to rate case and through the various stages of each case.

This project includes the rewrite of gas RESPIN, a flat file mainframe system that will be replaced by server-based relational database technology. It includes a front-end rate impact and analysis tool. It also addresses the need for software upgrades to support the Gas Load Research Program, approved in Case 06-G-1332.

The work required calls for a multi-stage approach.

- The first stage involves the analysis of data requirements required for the replacement of gas RESPIN.
- The second stage involves analyzing gas mainframe RAMIS-based rate design programs and creating rate impact and rate design analysis tools specific to gas system requirements. The rate impact analysis tool will utilize the same front-end systems used for electric rate analysis tool design and expand its functionality to accommodate special gas rate impact analysis and reporting requirements.
- The third stage creates links between the gas customer usage relational database and the gas interval data warehouse to the Dynamic Load Shaping (DLS) system, demand analysis and load shaping software. Included in this step are front-end changes to DLS to enhance data validation to include comparisons between gas billing data and gas 15-minute interval data.

High level schedule assumes a three year rate plan spanning October 1, 2010 through March 31, 2013. The first phase will begin in 2010. This is primarily an analysis step to ensure that the gas design is compatible with other rate case and load research software tools. The actual software

analysis and development will commence in 2011 and be completed by year end 2012, with the system roll-out scheduled for completion by Spring 2013

**Justification:**

• **Alternatives/Risk of No Action:**

There is real concern about gas RESPIN's ability to meet expanding rate case needs without considerable revision. As designed, RESPIN formats are not consistent with reporting and analysis needs, requiring considerable off-line data manipulation to combine and separate class data to meet requirements.

RESPIN mainframe databases rely on a RAMIS inquiry tool. This rate analysis front-end software replaces RAMIS queries that are inflexible and limit the breadth of analysis within rate case timelines.

Gas RESPIN's shortcomings will limit the functionality of DLS for gas, without time-consuming off-line data manipulation of gas usage data.

Most of the permanent gas load study installations will be completed by 2010 so the linkage of the gas interval data warehouse to load shaping software that includes a VEE (validation, editing and estimation) function will ensure optimum utilization of this data without taxing existing staffing.

• **Non-financial Benefits (if applicable):**

The RESPIN inquiry tool, RAMIS, is no longer supported with training and company personnel with RAMIS training has become limited, causing a shift of more inquiries to IR support staff to meet these increasing demands for additional data.

The standardization of rate case data and load shaping analysis tools support Company efforts for more integrated planning and optimizing of resources.

• **Technical Evaluation/Analysis:**

Required changes not currently in place in gas RESPIN:

- Identifier for Distributed Generation Customers (SBLI Code)
- Identifier for Purchase of Receivables (POR) customers
- Identifier for company accounts
- Identifier for Public authority accounts
- Separate field for customer charge indicator
- Increase billing information for SC1 from 13 to 26 months

• **Project Relationships (if applicable):**

As noted, DLS, which relies on customer usage and interval data inputs, replaced the Load Survey System in 2009. Gas RESPIN, or its successor system, is an input to the DLS system. Enhancing this load research software tool to include gas data will improve the benefits of DLS.

Both CECONY and ORU have parallel but not identical systems for storage of interval data and efforts are underway to standardize all interval data warehouse software. Software upgrades to support gas interval data are consistent with these plans.

Efforts which facilitate analysis between and among services and provide common analysis tools improve the quality and breadth of analysis, minimize training requirements and optimize utilization of these analysis tools by existing staff.

**Estimated Completion Date:**

This program is not dependent on any other software project in other proceedings. The project is scheduled for completion by December 31, 2012, with the roll-out in the first quarter of 2013.

**Estimated Completion Date:**

2012

**Status:**

Started.

**Current Working Estimate (if applicable):**

**Funding: (\$000s)**

Approved 2011	Request 2012	Request 2013	Request 2014	Request 2015	Request 2016	Request Total
522	\$582					\$1,104

## 2012 Capital – Business Unit/ Division

<b>Project/Program Title</b>	Repair Tax Expense
<b>Priority Number</b>	
<b>Project Manager</b>	Paul Poplawski / / Dmitry Kovalenko / Joseph DePiano
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Number</b>	1XC9716
<b>Status</b>	Started
<b>Estimated Service Date</b>	09/01/2012
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	

### **Work Description:**

The US Treasury Department re-proposed regulations in March of 2008 which sought to clarify and reduce controversy in determining whether amounts paid with respect to the potential improvement (repair allowance project) of tangible property must be capitalized by providing some bright line tests, simplifying conventions, and safe harbor elections. We hired Ernst & Young to determine the Company's repair allowance deduction for tax years 2010 and prior and on the 2009 return we took a deduction of \$568 million for CECONY and ORU. The 2010 amount has not been determined. For tax year 2011 (filing of return in September 2012) we are seeking an automated solution to replace Ernst & Young (E&Y) effort in determining the repair allowance deduction. The repair allowance project has been discussed with the Public service Commission.

E&Y's repair allowance methodology is to use high value statistical sampling of work orders. This is a manual effort which does not consider total allowance eligible assets. In addition, the IRS sometimes requests a settlement due to the fact that the data is not easily supported.

The automation of repair allowance will allow every single work order to be evaluated, not just the big dollar value ones, and supporting documentation will be readily available. The automating will increase the tax benefit from an estimated double to triple the current repair allowance deduction, which is estimated to be around \$30-90 million per tax year generating an incremental tax savings of \$12 to \$36 million. The benefit in 2009 had a retroactive component. In addition, there will be an additional estimated cost savings of approximately \$100K yearly from E&Y consulting fees, although we are not certain they are willing to do this work on a perpetual basis.

Many natural gas transmission and distribution companies, including Coned, have requested permission from the Internal Revenue Service ("IRS") to change their tax accounting method for expenditures to replace property. Many of these costs were historically capitalized, but under the new method of accounting they will be currently deducted as repairs. This change in method of accounting does not change the company's book or regulatory accounting method, and provides substantial economic benefits for customers, (accelerated deduction of \$567 million in 2009). The IRS has granted Coned permission to change their method of accounting subject to an important proviso -- the determination of the IRS Director responsible for utilities that the method of accounting clearly reflects income. Thus, while the IRS has granted permission for companies to change their method of accounting, the IRS has not yet determined the method of accounting to which the companies are permitted to change.

Most of the assets involved are wires, pipes, etc. which are considered "network assets" under currently pending proposed Treasury regulations. The proper treatment of network assets is not provided by the proposed regulations.

Departing from book processing by introducing tax units of property for repairs impacts the entire asset life cycle from CWIP construction to retirement. It introduces significant calculation and record-keeping requirements, timing issues, audit concerns, and adjustment activity. These are all covered in Version 10.2, of PowerPlant which is currently being installed.

It is important that tax unit repair expensing be processed within the PowerPlant Fixed Asset System:

- To provide a consistent and auditable process. The expensing must be consistent with retirement processing, deferred tax treatment, other tax transactions such as capitalized interest, bonus depreciation, benefit capitalization, etc.
- **To eliminate the dependence on E & Y to perform the calculation.**
- To provide the ability to make tax capitalization decision changes after year end but before the return is finalized or on audit.
- To provide automatic current adjustments to the calculations of tax-basis overheads (capitalized tax interest, SSC, PRA etc.) when making or changing a repairs election.
- Allowing for network assets and generation assets to be automatically accommodated if elected by the taxpayer.
- To provide flexibility to accommodate changing interpretations or tax positions and book accounting standards; differing book or tax data (e.g. differing work order structure or closing processes for blankets vs. specifics).
- To provide current month information for the provision accrual. This is the only way to accurately calculate estimated payments. To provide consistency and the ability to re-evaluate bonus and expensing assumptions; providing the ability for the tax department to optimize its deductions and perform critical tax planning functions.

### **Justification:**

- **Alternatives/Risk of No Action:**

If Repair Allowance is not generated directly from the PowerPlant software asset database, the tax benefit could be reduced or eliminated. Currently, the tax benefit is being calculated manually by E&Y but they have never indicated that they planned to continue to do a manual calculation going forward. Initial charges were \$600,000, to perform the initial “Repair” study including 2010. Going forward, we will need to contract with E&Y (estimated \$100,000 annually) to calculate the “Repair Tax Expense” deduction..

- **Summary of Financial Benefits and Costs:**

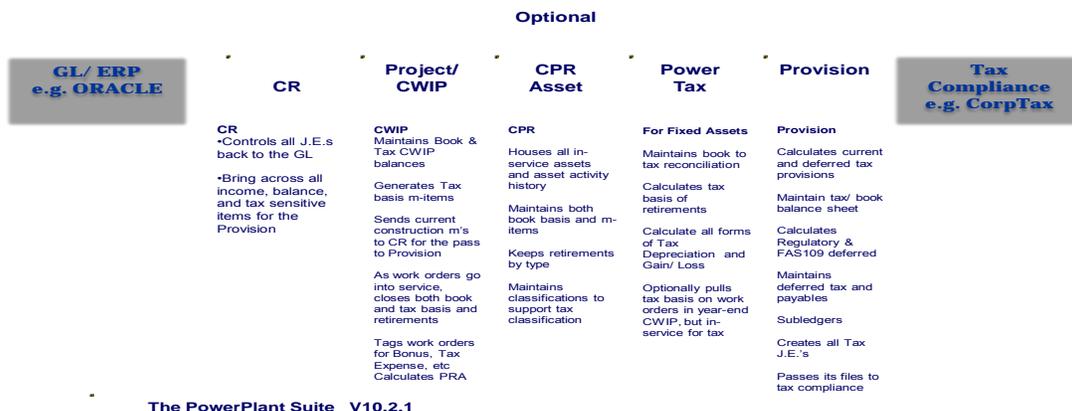
Repair Allowance increases the tax benefit from an estimated double to triple the current repair allowance deduction, which is estimated to be around \$30-90 million per tax year generating an incremental tax savings of \$12 to \$36 million. The benefit in 2009 had a retroactive component.

- **Non-financial Benefits (if applicable):**

Currently “Repair Tax Expense” is calculated on an excel spreadsheet in conjunction with legacy system data dump provided by the Property Records Department. Implementation of the “Repair Tax Expense” module within, PowerPlant fully processes repair expense options and maintains tax units of property directly on its book unit catalog. PowerPlant explicitly maintains a book and tax basis CWIP balance. Driving further

into basis differences, PowerPlant calculates avoided cost tax interest on the tax basis, taking into account de minimus rules. The following exhibit shows the overall Tax Flow of Processing in PowerPlant:

## Overall PowerPlant Tax Flow



Proprietary Information of PowerPlan Consultants, Inc.



- **Technical Evaluation/Analysis:**

*Include a summary of the analysis that was conducted, specifically if Information Resources will be required to implement.*

- **Project Relationships (if applicable):**

**Estimated Completion Date:**

Start in August 2011 and complete by April 2012

**Status:**

*Not started.*

**Current Working Estimate (if applicable):**

Based upon estimates we received from PowerPlan Consultants', we estimate the cost to be \$850,000 for consulting fees including out of pocket expenses, plus any additional IR, IT and employee labor cost to cover the work effort required by conEd technical and business analyst. We need to determine Ernst & Young's cost if any.

**Funding: (\$000s)**

Request 2011	Request 2012	Request 2013	Request 2014	Request 2015	Request Total
340	\$510	\$0	\$0	\$0	850

**2011 Capital – Business Unit/ Division**

<b>Project/Program Title</b>	Contact and Investigation Tracking System
<b>Priority Number</b>	
<b>Project Manager</b>	
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Number</b>	
<b>Status</b>	
<b>Estimated Service Date</b>	4 <sup>th</sup> quarter 2011
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	Provide accurate information to the Board and Satisfy PSC (CRA) recommendation to improve communication and synergy among the various investigative groups.

**Work Description:**

- The objective of this project is to create a single system to capture (intake), manage and report on investigation activities for the various organizations that conduct and participate in investigations. The system will have a central repository that will enable Auditing to satisfy the requirement to provide the Board Audit Committee, investigation statistics of significant investigative findings by individual investigating groups as well as an aggregated summary.

**Justification:**

- Alternatives: Since all the affected investigative groups have their own unique tracking system, we cannot reasonable assume that all the contacts and investigations will be properly followed-up and properly recorded.
- Risk of No Action: Inaccurate reporting and initiation of duplicate or multiple investigations for the same issue.
- Summary of Financial Benefits and Costs: Reduced use of manpower for duplicate investigations, time and effort involved in obtaining and recording of contacts, and investigations for the Board and satisfying the PSC (CRA) recommendation to share data with all groups for more effective investigative process.
- Non-financial Benefits (if applicable): We have been reporting this information manually to the Board and have been criticized by the PSC consultant (CRA) that we do not share or utilize investigative information for a more timely and thorough investigation of the issues or utilize this information to develop patterns for individuals or contractors used by the Company.
- Technical Evaluation/Analysis:
- Sensitivity Analysis (if applicable):
- Project Relationships (if applicable):

**Estimated Completion Date:** 4<sup>th</sup> quarter 2011

**Status:** A high level requirements gathering has been performed.

**Current Working Estimate (if applicable):**

- A high level estimate has been reviewed by the various organizations associated with this effort.

**Funding: (\$000s)**

2 <sup>nd</sup> Review 2008	Request 2009	Request 2010	Request 2011	Request 2012	Request 2013	Request Total
			260	52		272

- **Authorization**
- **Appropriation**

**2013-2017 Capital  
Business Unit/ Division**

<b>Project/Program Title</b>	Case Management System
<b>Priority Number</b>	
<b>Project Manager</b>	Paul Hammer (Application Services), Cynthia Perez (Law)
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Number</b>	
<b>Status</b>	Planning Stage (Phase 0)
<b>Estimated Service Date</b>	Fourth Quarter 2012 (Initial Implementation)
<b>Work Plan Category</b>	
<b>ERM Addressed</b>	Technology in computer systems becomes unsupported

**Work Description:**

Units per Year: N/A

Mandatory: No

High-level schedule:           Anticipated Start – Fourth Quarter 2012  
  Anticipated Completion – Third Quarter 2014

The existing Case Management System contains the following modules supporting CECONY and O&R claims and litigation processing:

Docket management subsystem - records litigation documents served on or by the company and maintain the schedule and assignment of appearances.

File Room/Library subsystem - tracks claim and litigation files maintained by the Law Department in its Central File Room

Case Tracking subsystem - tracks of claims, lawsuits and memo bills

Time allocation subsystem - records attorney, paralegal and investigator time spent on projects, claims or lawsuits.

Notes – records notes related to projects, claims or lawsuits

Process Service – accepts and tracks activity of subpoenas and information requests received by CECONY and O&R

Outside Legal System – processes payments and tracks activity of law firms and consultants retained for various legal matters.

- Summary of Financial Benefits and Costs:

The Medicare, Medicaid, and SCHIP Extension Act of 2007 (MMSEA) imposes a new duty on companies identified as “primary payers” (any entity with liability for medical payments). The Act imposes a mandatory reporting requirement to provide the government with the knowledge of all settlements, awards, judgments or other payments for personal injury cases involving a Medicare beneficiary and gives Medicare the absolute right of recovery of payments made on behalf of recipients. The Act requires us to electronically submit quarterly reports of tort liability matters, workers’ compensation and no-fault cases. As of January of this year, we are required to report all workers’ compensation and no fault cases opened on or after January 1, 2010. Beginning January, 2012, there is an added requirement to electronically submit quarterly reports of total payments for personal injury matters paid on or after October 1, 2011. Failure to comply with these reporting requirements will result in a penalty of \$1,000 per day per claim.

To accommodate the electronic exchange of information, Medicare has developed a software product requiring very specific file formatting. We are currently working with Sedgwick (our workers’ compensation third-party administrator) to self-administer mandatory reporting using the software product (viaOne) they have developed to handle compliance in workers’ compensation cases. However, because there is no integration between Case Management and Sedgwick, the process is time-consuming and inefficient. Every personal injury claim or lawsuit must be manually entered on to viaOne and individually monitored for compliance apart from Case Management. The possibility of failing to enter a case or monitor it up until the time to report is a significant concern.

The purchase of a new case management system with the capability of transmitting data to Medicare would eliminate the duplication of entering data as well as reduce the possibility of missing reportable cases.

In addition to the mandatory legal reporting requirements described above, the system is a 16-bit application that uses a development language and communications gateway that is no longer supported by the vendor. The department relies on Information Technology to provide frequent enhancements to accommodate claim processing for major incidents or litigation involving multiple parties. It also lacks basic flexibility for ad hoc reporting, browsing and attaching files, photos and other supporting documentation for claims and litigation.

- Non-financial Benefits (if applicable):

Increased efficiencies to handle existing volume with anticipated attrition

- Technical Evaluation/Analysis:

- Sensitivity Analysis (if applicable):

- Project Relationships (if applicable):

**Justification:**

- **Alternatives:** Continue to use the company's third-party administrator system to manage mandatory Medicare reporting requirements.
- **Risk of No Action:** Failure to report medicare-eligible claims and litigation as required under the Medicare and Medicaid SCHIP Extension Act of 2007. System failure resulting in the inability of the Law Department to manage court appearances and status dates. System failure when managing claims and litigation against the Company including processing claims resulting from major system incidents.

**Estimated Completion Date:** Third Quarter 2014

**Status:** Planning State (Phase 0)

**Current Working Estimate** (if applicable): \$605,000

**Funding (\$000):**

<b>Actual 2011</b>	<b>Actual 2012</b>	<b>Actual 2013</b>	<b>Actual 2014</b>	<b>Actual 2015</b>
\$112,000	0			

<b>Approved 2011</b>	<b>Forecast 2012</b>	<b>Forecast 2013</b>	<b>Forecast 2014</b>	<b>Forecast 2015</b>	<b>Forecast/Approved Total 2013-2017</b>
\$105,000	\$605,000	\$1,500,000	\$500,000		2,710,000

- **Authorization - Pending**
- **Appropriation - Approved**

## 2012 Capital - Information Resources

<b>Project Name</b>	CCTN Facilities Improvements
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9805
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**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 savings. 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 commiserate with the criticality of the location
4. Grounding remediation
5. Swipe Card Access Upgrade

**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 service improvements based on the project upgrades:

**Year Trouble Tickets Reported**

2006	162
2007	213
2008	105
2009	89
2010	31

- \* 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:**

In Progress; since 2007 the following has been accomplished.

**Activity Completed Units**

1. HVAC systems 0 Locations
2. Cable replaced (fiber) 10,000 Feet
3. UPS/DC Power Systems 48 Rectifiers/Battery Stacks/UPS units
4. Grounding Remediations 0 Jobs
5. Swipe Card 1 Locations

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$589	\$561	\$532	\$532	\$532	\$532	\$532	\$0	\$3,811

**Benefit: (\$000s)**

<b>Benefits</b>	2013	2014	2015	2016	2017	Total
	\$0	\$0	\$0	\$0	\$0	\$0

- \* **2008 to 2012 Budget in Thousands-** \$1,150
- \* **2013 to 2017 Budget in Thousands-** \$2,661
- \* **Authorization-**
- \* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	CCTN Modernization - SONET Conversion
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9806
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**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. 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 delivers communications circuits using standard protocols called SONET & DWDM. Information Resources has recently 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. It is also estimated that the core trunk of the network will need to be replaced in 2015.

**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. 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.

This project identified in this white paper address 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 procure all communications from carrier services. This approach is not recommended due to failure rates associated with carrier circuits, the high costs, and construction costs and lead time associated with repair and new service delivery.
- \* 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 scarcity of replacements.
- \* 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
  - Can be scaled over time to increase capacity through circuit card replacements
  - Improved recovery time from communications failures
  - Ability to provide secure services outside of the Telco carriers
  - Avoid costs and delays associated with construction costs of carrier circuits
- \* 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; 35% of Lucent circuits have been converted to date

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$196	\$338	\$168	\$338	\$196	\$196	\$196	\$0	\$1,628

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	Total

	\$0	\$0	\$0	\$0	\$0
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\* **2008 to 2012 Budget in** \$534  
**Thousands-**

\* **2013 to 2017 Budget in** \$1,094  
**Thousands-**

\* **Authorization-**

\* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	CCTN Expansion Buchanan
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9807
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2012
<b>ERM Addressed</b>	

### 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 savings. There are over 100 Company locations which host the equipment used by CCTN. These locations, referred to as CCTN nodes, are equipped with power, cabling and cooling systems and provide for a redundant and diverse design for the network.

One of the CCTN nodes is located on the Buchanan property and consists of five disparate facilities with various telecommunications equipment. The scope of this work is to consolidate the equipment into a single pre-fabricated that will eliminate the duplication of common plant like HVAC and DC power, while providing back-up generator for all systems and a single point grounding plan, which altogether will enhance the overall reliability at this important telecom facility.

The following is a list of the equipment at the five facilities at the Buchanan Service Center & Substation:

#### Service Center -

Microwave Hut – 6 GHz CCTN microwave; DC System; Dish on pole at Entergy property.

SONET Room – OC48 & OC3 CCTN MUXes; 1 Ch.Bank; shared with Entergy & no b/up gen.

DC Room – 1 redundant rectifier; 1 battery stack with five 48VDC strings.

#### Substation -

Control Room – OC3 CCTN MUX; 1 Ch.Bank; Man-Down Radio (all on substation DC plant)

Deluge Room – Unlicensed CCTN wireless local loop microwave; 1

Rectifier; 1 battery stack Antennas – Microwave dish on 20 ft pole; Man down omni on control center roof.

The work includes:

- Engineering, Planning, Permitting for new hut.
- FCC re-licensing and tower structural analysis.
- Installation of conduit system for new hut.
- Installation of foundation for new hut with HVAC and AC power.
- Installation of new hut.
- Installation of new CCTN & radio eqpt and DC plant in new hut.
- Installation of backup generator with ATS switch in new hut.
- Installation on new dishes and omni antenna on transmission tower.
- Installation of new waveguide at new hut and tower, including ice-bridge.
- Implementation of single point grounding plan.

**Justification:**

CCTN at the new Buchanan hut 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. Additionally, critical fiber running connecting CECONY and O&R traverses the Buchanan property. CCTN at the new Buchanan hut will provide protection and data services to the service center and critical substation 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.

CCTN node at the new Buchanan hut will 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 improved grounding will eliminate disturbances to communications equipment caused by substation switching and the single point ground will eliminate current loops among the interconnected telecommunications systems.

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

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

\* **Alternatives:**

The alternative is to leave the site as is and respond to failures as they occur. This approach is not recommended due to failure rates associated with the existing conditions and the criticality of the location with respect to CCTN

\* **Risk of No Action:**

Risks include increased communications failures associated with

substation high-voltage switching, disparate HVAC systems, complicated cabling and power loss due to inconsistent back-up generator. 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. The duplication of common plant will perpetuate inefficiencies that result in higher O&M costs

\* 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
- Simplified operation and maintenance
- Simplified access control and physical security
- Enhanced remote monitoring
- Improved wireless communications reliability
- Greater resilience to lightning and substation switching disturbances

\* 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:**

Engineering, FCC re-licensing & permitting begun in 2011

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$0	\$507	\$0	\$0	\$0	\$0	\$0	\$0	\$507

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	2017	Total
	\$171	\$171	\$171	\$171	\$171	\$855

\* **2008 to 2012 Budget in Thousands-** \$507

\* **2013 to 2017 Budget in Thousands-** \$0

\* **Authorization-**

\* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	CCTN Expansion - Mobile WiMAX Access Network
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**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. There are over 100 Company locations which host the equipment used by CCTN. Since the late 1980's, over 400 miles of fiber optic cable has been implemented to provide CCTN communications services. In most cases, these fiber runs were done so in an efficient fashion by combining with electric distribution cable installations. As business requirements and interference requirements are addressed, expansion and rerouting of CCTN fiber paths are required each year. Additionally, alternate technologies to compliment and approve CCTN communications requirements are planned for the next 5 years. WiMAX wireless technology has demonstrated the promise to deliver high performance while not requiring line of sight. Projects planned include:

- Acquire licensed broadband spectrum to replace the unlicensed wireless local loops
- Design and implement a WiMax antenna at Brooklyn Tower
- Evaluate WiMAX solutions as alternatives and compliments to fiber

**Justification:**

Deployment of a highspeed mobile data network on the proven standard based WiMAX technology platforms 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 like the 2006 steam explosion that caused outages on all major carriers that sustained damage to their copper and fiber assets in the local area.

A high speed wireless data infrastructure can provide diverse backhaul

connections facilities affected by such incidents over the air as opposed to under the ground.

While unlicensed non-WiMAX 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 acquire broadband spectrum and to pilot a system on equipment that can be initially deployed on unlicensed spectrum and be easily reconfigured to operate on licensed spectrum.

The pilot will be deployed at one or more of Con Edison's leased radio facilities and form the seed network that can be expanded over time and as licensed spectrum becomes available.

A WiMAX network will not only provide guaranteed backhaul communications to existing facilities but also for the mesh networks that are currently being deployed for Smart Grid.

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 address 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

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

- Failure of critical business application
- Infrastructure constraints
- Safety
- Critical radio system infrastructure

\* Alternatives:

The alternative to WiMax is to continue to operate using expensive fiber construction wherever services are required. This approach is not recommended because opportunities to improve availability and reduce fiber construction costs would not be realized.

\* 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 a WiMax strategy the Company risks losing critical communications with field workers.

- \* 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

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$459	\$403	\$1,031	\$805	\$805	\$240	\$0	\$0	\$3,743

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	2017	Total
	\$0	\$0	\$0	\$0	\$0	\$0

- \* **2008 to 2012 Budget in Thousands-** \$459
- \* **2013 to 2017 Budget in Thousands-** \$3,284
- \* **Authorization-**
- \* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	CCTN Modernization - Mapping System
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	

**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 delivers 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 instantaneously 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 GIS software will provide for the day-to-day design, planning, and operation of the SONET, DWDM, Ethernet, OSP/ISP Fiber, Copper, CAT5, and COAX network infrastructures.

**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 anyone to quickly determine fiber routes to assist with repairing breaks or

designing new paths.

This project identified in this white paper address 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 manually input and static Circuit Layout Records (CLRs) to track the ever growing 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 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: IT projects, completed or future require and expect sufficient performance of the network.

**Current Status:** Product evaluations

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$506	\$195	\$0	\$0	\$0	\$0	\$0	\$0	\$700

**Benefit: (\$000s)**

<b>Benefits</b>	2013	2014	2015	2016	2017	Total
	\$0	\$0	\$0	\$0	\$0	\$0

\* **2008 to 2012 Budget in Thousands-** \$506

\* **2013 to 2017 Budget in Thousands-** \$195

\* **Authorization-**

\* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	Cyber Security - Info Resources
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**Work Description:**

Evaluate and implement technology to reduce the risk of unauthorized access to Con Edison resources by evaluating and implementing products to enhance security and control over all aspects of access. The following projects are planned to improve the security level in 2012:

- Evaluate and implement behavior based Intrusion Detection Systems
- Evaluate and implement Fraud Detection System
- Evaluate and implement multifactor authentication for remote access
- Evaluate and implement new IP Address assignment technology

**Justification:**

Cyber Security has been identified as one of the top Corporate risks in its risk profile 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 each day new techniques are identified to 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 technology in place at Con Edison today.

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 cyber security technology is to maintain the existing environment and limit accessibility from the Company to external resources and restrict access to Company resources from the outside
- \* Risk of No Action: Failure to maintain a proactive stance will create an unacceptable 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:
  - Improve perimeter defense and monitoring using behavioral network technology
  - Improved processes for server and application security administration
  - Improve 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 commiserate with best practices

**Current Status:** Firewall standards established in 2009; IDS systems updated in 2010; Two Factor authentication and remote access design updated in 2011

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$1,463	\$991	\$629	\$512	\$620	\$900	\$0	\$0	\$5,114

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	2017	Total
	\$0	\$0	\$0	\$0	\$0	\$0

- \* **2008 to 2012 Budget in Thousands-** \$1,463
- \* **2013 to 2017 Budget in Thousands-** \$3,651

## 2012 Capital - Information Resources

<b>Project Name</b>	Collaboration Tools
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9800
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**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 Status:** In Progress, OCS deployment; web conferencing upgrade, video conferencing solution, web servers recently upgraded to 2008.

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$375	\$500	\$0	\$259	\$512	\$512	\$250	\$0	\$2,408

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	2017	Total
	\$0	\$0	\$0	\$0	\$0	\$0

- \* **2008 to 2012 Budget in Thousands-** \$875
- \* **2013 to 2017 Budget in Thousands-** \$1,533
- \* **Authorization-**
- \* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	Desktop Infrastructure
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9803
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

### Work Description:

Introduce and maintain a standard desktop set of tools which incorporate the latest technology to create improve productivity and provide easy access to resources needed to perform business functions. The project will streamline the delivery and maintenance of third party tools such as Office, Visio and Project and client server business applications from any computer. Additionally, the project will create a library of virtual applications which will available for immediate downloads from any PC internal or external through remote access technology. User content and search engine will be available 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 initiatives:

- Application virtualization
- Application access through VDDI or Terminal services
- MEDV technology to allow virtual desktop images for locked down environments and restricted resources
- Video conferencing to the desktop
- Deployment of Windows 7
- Office 2010
- Data Retention requirement to identify owners of data and provide access to through an application which incorporates all content to one screen
- Software auditing control through central software streaming

### Justification:

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 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. In many cases, avoids the requirement to patch 14,000 PCs and disrupt the

operation in doing so. Enable employees to work anywhere access all resources. 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

- \* Alternatives: The alternative is to remain on the current desktop environment with limited options for software deployment. In 2013, in order to maintain a 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

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2011	2012	2013	2014	2015	2016	2017	2018	Total

	\$1,500	\$1,000	\$782	\$1,567	\$1,371	\$782	\$782	\$0	\$7,784
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**Benefit: (\$000s)**

Benefits	2014	2015	2016	2017	2018	Total
	\$850	\$850	\$850	\$850	\$0	\$3,400

\* 2008 to 2012 Budget in Thousands- \$2,500

\* 2013 to 2017 Budget in Thousands- \$5,284

\* Authorization-

\* Appropriation-

## 2012 Capital - Information Resources

<b>Project Name</b>	Business Systems Sustainability - Upgrade Applications to SQL Server 2008
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	O'Donoghue
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**Work Description:**

This is a business systems sustainability project necessitated by the end of Microsoft Extended Support for SQL Server 2000 on April 9, 2013. At that time, Microsoft will no longer provide security updates for SQL Server 2000, potentially exposing corporate data and assets to security breaches. Information Resources' Database Administration group is leading the SQL Server 2000 Upgrade Project to upgrade all SQL Server 2000 installations to later versions of SQL Server. In addition, many corporate systems will require remediation to accommodate for this change. Many of these systems also execute Data Transformation Packages (DTS). DTS is a set of SQL Server 2000 tools used to extract, transform and load data between one or more data sources, such as Microsoft SQL Server, Microsoft Excel, flat files, DB2, Oracle and other data sources accessible via OLE DB. These DTS packages will require upgrades to a new technology known as SQL Server Integration Services (SSIS) or must be replaced by another technology. Upgrading DTS packages to SSIS requires the re-coding of the package logic to the SSIS format and testing the converted SSIS package to ensure business logic is preserved.

- As part of a larger effort to upgrade server hardware, SAN and licenses (SQL Server and others), this project funding is needed for resources to perform the work to migrate systems to the newer technologies. Also included in this project are the following items: Training to deploy and maintain newer technologies
- Staffing for analysis, conversion, and test of the upgraded applications. At approximately two weeks staffing to convert and test DTS packages to SSIS, the effort requires detailed analyses for each system to formulate an upgrade path.
- Testing batch processes (other than SSIS) migrated to SQL Server 2008 R2, eg, stored procedures and Visual Basic executables.
- Purchase licenses for the PragmaticWorks DTS xChange tool to convert DTS packages to SSIS. The cost is \$50 per DTS package. This option does not obviate the need for training because the upgraded packages need to be supported (maintenance and business functionality enhancements)

**Justification:**

Critical systems will be running on unsupported technology. SQL Server databases not upgraded by the end of the SQL Server 2000 Extended Support period will be isolated from the corporate network as per corporate security policy. The primary purpose of this isolation is to apply additional security measures to protect these servers from outside contact. These measures may result in performance problems, loss of functionality and, most significantly, the potential loss of service in the event of a serious cyber event. SQL Server 2008 R2 delivers improved performance, scalability, availability, security and monitoring. In addition, Microsoft provides Extended Support for SQL Server 2008 R2 R2 through January 8, 2019.

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 R2 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: None. The only viable option to reduce inevitable downtime of information system assets is to be proactive in migrating to the new supported technology platform. Unsupported technologies would need to be isolated from the network to maintain corporate network security. Isolating systems with unsupported technologies will result in unpredictable and likely severe, system performance and data security issues
- \* Risk of No Action: For systems still able to run in isolation, the risk exists that a patch, operating system upgrade, database upgrade or simple changes in hardware technologies 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. As previously mentioned, no action will result in critical billing and other systems to run on an unsupported technology, forcing isolation from the corporate network as per corporate security policy, resulting in performance problems, loss of functionality and, most significantly, the potential loss of service in the event of a serious cyber event.

Failure to migrate to the new database technology platforms will result in:

- Reduced availability of critical business applications. Database security and access is critical to providing business support, where corporate data needs to be delivered to new consumer and corporate environments and a near-real time basis.

- Inability to securely integrate corporate data across systems. Unsupported database technologies cannot deliver on new business requirements, and the increased demands to integrate with external products and entities. This integration relies heavily on the standardization of platforms and security standards, where failures in an application data source will cause multiple system failures. In addition to loss of system availability, the complications caused by unsupported data sources dramatically increases system recovery time.

- The Company being unable to manage its information system portfolio due to data and computing technologies that are out of sync with the marketplace, and a lack of available skilled technical resources in the workforce.

- \* Non Financial Benefit Explanation: The loss of system and data availability to customer or other consumer entities would have costs associated with the negative publicity and protests from regulatory and other consumer advocacy groups. The loss of systems isolated from the secure network would cascade to all business areas in the Company. The secure, reliable delivery and storage of customer and other sensitive data is an obligation as a public utility.
- \* Technical Evaluation and Analysis: Analysis is done for each application to determine whether it would be more beneficial and cost effective to replace or remediate the system prior to mitigating to the supported technologies
- \* Project Relationships:

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$570	\$920	\$901	\$463	\$729	\$875	\$0	\$0	\$4,458

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	2017	Total
	\$200	\$400	\$800	\$1,600	\$3,200	\$6,200

- \* **2008 to 2012 Budget in Thousands-** \$570
- \* **2013 to 2017 Budget in Thousands-** \$3,888
- \* **Authorization-**
- \* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	Business Systems Sustainability - Upgrade Applications to Windows 7
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	O'Donoghue
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

### **Work Description:**

In order to upgrade our client PC operating system from Windows XP to Windows 7, we must rewrite and upgrade our client (PC) applications in order to sustain expected levels of performance and security in our computing environment. Older systems, such as those written in unsupported programming languages such as (Classic) Visual Basic 6.0, must be rewritten in the new Visual Studio development environment, and must be upgraded to the Visual Basic.Net platform in order to operate on the Windows 7 operating system.

Applications written in the unsupported Visual Basic 6 (VB6) language are rapidly approaching the point at which the cost to operate and maintain these applications will surpass reasonable budgetary allowances, and the risk to business support increases. These applications perform critical business functions across various departments. Sustaining these business systems requires they be rewritten in programming languages that can operate in more secure, supported operating systems. Extending the life of these systems is a strategic step that aligns with our technology roadmap and is vital to many critical business functions. Upgrading these applications will allow us to maintain and enhance systems to meet the business needs over the coming years in an efficient and cost effective manner

### **Justification:**

Windows 7 is Microsoft's premier flagship workstation operating system. It has proven itself to be more stable and more robust than our current operating systems – Microsoft XP which was released back in 2001. In addition, Windows 7 is more secure and more feature rich than its XP predecessor. Unfortunately, a number of company systems, especially the ones written using Microsoft's development platform Visual Basic 6 and prior, will actually suffer from the new O/S and some may not even be able to run.

Con Edison now has a plethora of VB6 applications that play a key role in a majority of systems around the company. VB6 applications are found in our call centers, help manage energy programs, are used to

perform billing functions and play a crucial role in expediting emergency tickets. They are found in almost every area of business we have today. Unfortunately, Microsoft stopped supporting the VB6 platform in April of 2008, and it is becoming increasingly more difficult to maintain. It is only a matter of time before a security patch or a new operating system such as the migration to Windows 7 disables the environment altogether and potentially causes mission critical systems to fail, risking impact to business operations. Microsoft stated in a recent post that although applications based on its own basic components may run on the Windows7 platform, it cannot guarantee the development environment will run, making maintaining these applications a risk in the near future. The development environment needed to maintain existing systems is definitely not supported on its newer 64bit operating systems.

The level of risk associated with these VB6 applications will increase exponentially as time passes. As developers learn new development platforms, the experience and knowledge of the older platform will diminish over time. Support costs for these applications will increase as the time to make changes is increased, and the risk to retain resources skilled in the obsolete technologies increases. Training will be required for some developers to learn older technologies adding to the overall cost of maintaining them.

VB.Net is a modern, more mature version of VB6. It's a feature rich development environment that uses - as well as consumes- the latest technologies. It probably uses the easiest, most simple language syntax than another language. When the apps are re-written, they will inherit VB.Net's features such as:

- 1) VB.Net code is "managed code". There is less chance of a badly written app to "crash" a user's machine.
- 2) VB.Net apps consume newer technologies natively. Standard industry web services are easier to consume, and security can easily be implemented within the call. Encryption algorithms to secure data (or access data) are native in the vb.net platform.
- 3) VB.Net apps perform better and can be written to be scalable
- 4) A developer can take advantage of all of OOP (Object oriented programming) methodologies, including inheritance, reflection, overloading, polymorphism and encapsulation – basically making the code more compartmentalized and simpler to read.
- 5) Programs can be re-written to take advantage of multi-threading capabilities of vb.net which was impossible in VB6. This means that an application can take half the time to do repetitive tasks
- 6) "NTServices" applications – applications that reside on servers – were complicated to write and set up using VB6. VB.Net now makes it easier for these applications to be written and seployed and natively supports server related features such as writing to event logs and accessing performance monitors.
- 7) Applications in VB.Net can be ported to other platforms as well, with minor work, so they can run on mobile platforms and pda's.

- \* Alternatives: None
- \* Risk of No Action: Failure to migrate to the new language platform will 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 VB6, ranging from \$200K to \$800K per year over the first 3 years.

- 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.
- In some cases, Windows 7 will not be able to be deployed exposing the Company Network to greater risk of security threats as the older operating system is no longer supported.

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

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$570	\$920	\$901	\$463	\$729	\$950	\$0	\$0	\$4,533

**Benefit: (\$000s)**

<b>Benefits</b>	2013	2014	2015	2016	2017	Total
	\$200	\$400	\$800	\$1,600	\$3,200	\$6,200

- \* **2008 to 2012 Budget in Thousands-** \$570
- \* **2013 to 2017 Budget in Thousands-** \$3,963
- \* **Authorization-**
- \* **Appropriation-**

## 2012 Capital - Information Resources

<b>Project Name</b>	New Technology
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	1XC9802
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**Work Description:**

.Introduce new technology to provide solutions for business requirements and improvements in productivity, 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. Products selections are done in conjunction with IR strategy drivers and vision statement and in many cases are selected for installation in the prior year.

**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 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 to begin to erode or fail to the point that a quick and less analytical technical decision is implemented reducing 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 unsupported and insecure by not introducing upgrades where necessary or when functionality that 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 will 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.

**Current Working Estimate:**

**Funding: (\$000s)**

Funding Cost	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$997	\$500	\$859	\$503	\$503	\$503	\$750	\$0	\$4,614

**Benefit: (\$000s)**

Benefits	2013	2014	2015	2016	2017	Total
	\$0	\$0	\$0	\$0	\$0	\$0

\* **2008 to 2012 Budget in Thousands-** \$1,497

\* **2013 to 2017 Budget in Thousands-** \$3,116

\* **Authorization-**

## 2012 Capital - Information Resources

<b>Project Name</b>	Computer and Communications Accounting System
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - System and Component Upgrades
<b>Priority</b>	
<b>Project Manager</b>	Denise Reid
<b>Project Engineer</b>	
<b>Budget Reference</b>	6XC9817 8XC9701
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Dec 31 2017
<b>ERM Addressed</b>	

**Work Description:**

TEMS (Telephone Equipment Management System) is the primary source of all telecommunication and computer cost chargebacks based on inventory and usage. Through several completed and planned enhancements, this will become a key part of an improved inventory, verification and chargeback process for CECONY, O&R and future companies.

We plan on making O&R invoice and chargeback processes the same as CECONY. This includes adding functionality for approving O&R invoices on-line and expanding O&R charge back capabilities to include land lines.

We also 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 chargeback infrastructure costs.

Telecom Central is an intranet web application that manages the workflow of wireless device requests and landline telecom device requests. Telecom Central is also the centralized repository to manage the inventory of Orange and Rockland wireless devices. Telecom Central will be enhanced to improve the process for maintaining landline inventory for Orange and Rockland. Also, a set of about 30 reports is being developed to manage billing and inventory exceptions for CECONY and O&R. This new functionality is key in maintaining accurate inventories for chargeback to the proper sections. Additional enhancements include creating workflow management for circuit ordering and procurement.

The Computer Cost Central (CCC) system provides a comprehensive repository of hardware and software inventory and charges back hardware maintenance and software costs to organizations based on inventory and installed information. Enhancements include adding more categories on inventory like plotters and digital senders etc. Additional reports will be developed on hardware and software inventory. The enhancements will allow users to monitor inventory status and software usage and facilitate the re-assignment of un-used licenses; avoiding unnecessary procurement.

**Justification:**

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

- Improved understanding by our customers
- Greater operational management reporting efficiency and cost control including the ability to “drill down” to details
- Effective leveraging of information stored in disparate systems
- Share quality and timely information; improve reliability and timeliness for compliance reporting
- View the organization from a customer perspective
- Respond to compliance reporting requirements with greater information accuracy, timeliness and traceability.
- Increase productivity by providing self-help capabilities and enabling users to spend more time in decision-making
- Provide the ability to mine data – predict future technical requirements based on past behavior, and identify patterns and trends to assist in contract discussions.

\* **Alternatives:**

• Maintain inventory in off line database (Excel, Access, etc.). This is not a recommended solution as it does not provide the built in security and expeditious 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 for expense chargeback 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. There are ongoing discussions with the Project One team to identify all of the necessary interface and validations points required to continue producing the same level of detailed inventory and cost reporting currently available

**Current Status:**

On-going

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$300	\$113	\$113	\$113	\$113	\$113	\$113	\$0	\$978

**Benefit: (\$000s)**

<b>Benefits</b>	2013	2014	2015	Total
	\$0	\$0	\$0	\$0

\* 2008 to 2012 Budget in      \$413  
Thousands-

\* 2013 to 2017 Budget in      \$565  
Thousands-

\* Authorization-

\* Appropriation-

## 2012 Capital - Information Resources

<b>Project Name</b>	Hudson Ave Communications Room
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - Strategic IT Enhancements
<b>Priority</b>	
<b>Project Manager</b>	Terry Walsh
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Jun 30 2012
<b>ERM Addressed</b>	

**Work Description:**

Design, purchase and install a centralized and dedicated facility (a communications hut) in unused space at the Farragut Substation to support CCTN, Verizon, and LAN facilities displaced due to the retirement and demolition of the Hudson Avenue Low Pressure Boiler House and Switch House.

Install underground ducts and copper cable and fiber optic lines from the new communications hut to the various POEs for CCTN and Verizon in order to re-route existing communications facilities around and off the buildings which are being retired and planned for demolition. The routes selected will provide maximum flexibility for future use of the site and utilize current underground infrastructure as much as possible on the streets within the Hudson Avenue property.

Install above ground conduits, pull boxes, copper cable and fiber optics to the remaining facilities on the Hudson Ave site for short term use prior to demolition and for long term use for the remaining operating equipment. This equipment includes selected elevators in the buildings, construction and operations trailers for short term use and the Gas Operations Tunnel Head House, Steam Operations SCADA and revenue metering and for the York Steam Line and Gas Turbines, and any potential future Company tenants (Facilities Management) at the site for the long term. Provide light and power, grounding and foundation for the new Communications Hut and perform transfers of the existing circuits to the new communications hut from the existing 6th floor communications room.

**Justification:**

The current location of the CCTN/Verizon/LAN room (Communications Room) at the Hudson Avenue Generating Station is on the 6th floor of the structure referred to as the Switch House. Various cable, conduits and fibers enter and leave this centralized location servicing the site for CCTN, Verizon, and LAN purposes and passing through the site servicing and connecting Company facilities in Brooklyn and Queens via CCTN routes to Farragut Substation, 30 Flatbush Avenue, and Ravenswood (on the TransCanada site).

The CCTN infrastructure supports various site uses; the former PBX (now retired) system, LAN access, GOSS , SOCCS (XA21), and

communications room monitoring. The pass through circuits include CCTN connections linking East River , Farragut, 30 Flatbush Avenue and Ravenswood servicing data/WAN, relay protection ; Tollgrade circuits, audiotone transfer trip circuits, and dielectric fluid leak detection systems associated with various 345kV and 138kV feeders. The CCTN circuits also provide alternative routes for other facilities in Manhattan, Brooklyn, and Queens.

The 6th floor communications room uses utilities associated with the Hudson Avenue Switch House; light and power, back up UPS, and HVAC. The Switch House will be de-energized and vacated by the end of 2011. The building will undergo asbestos abatement and demolition starting in the first half of 2013.

The cable and conduit infrastructure from the 6th floor communications room to the Gas Operations Tunnel Head House (CCTN route to Manhattan), runs through the Switch House and along the west wall of the Low Pressure Boiler House. The Low Pressure Boiler House will be de-energized and vacated by the end of 2011. The building will also undergo asbestos abatement and demolition starting in the second half of 2012.

The decision was made in October 2010 to retire the installed steam generating capacity of the Hudson Avenue Station in Brooklyn, NY. The decision is based on short term and long term steam load forecasts indicating that the steam system can meet its peak load requirements and required reserve without the capacity of Hudson Avenue Station for the foreseeable future.

\* Alternatives:

Several alternatives to the proposed scope were looked at:

Leaving the communications room intact in the vacated Switch House while maintaining light and power, HVAC, and access to Company personnel, Verizon personnel, and vendors as necessary-This has been done for the short term and will remain until demolition. The avoided roof repairs, tax savings from demolition, and avoided miscellaneous O&M for maintaining the infrastructure and providing access after all Station personnel are gone, justified eliminating this as an option.

Locating the new CCTN hut at the corner of Marshall St and Hudson Avenue in the vicinity of existing underground infrastructure to minimize trenching and new duct installation-This option leaves the CCTN Hut and infrastructure vulnerable to demolition activities associated with the Low Pressure Boiler House and the Switch House and was eliminated this as an option.

Locating the new CCTN hut in the vicinity of the Foam House in Maintenance bldg parking lot-Lack of existing underground infrastructure in the area and the need for excessive trenching and duct installation, and its location amid structures planned for eventual demolition eliminated this as an option

The Farragut location was identified as the option that provided a maximum use of existing underground infrastructure in the streets while maintaining flexibility for future use of the site

\* Risk of No Action:

\* Non Financial Benefit Explanation:

\* Technical Evaluation and Analysis:

\* Project Relationships:

**Current Status:** Working

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$1,000	\$1,500	\$0	\$0	\$0	\$0	\$0	\$0	\$2,500

**Benefit: (\$000s)**

\* **2008 to 2012 Budget in** \$2,500  
**Thousands-**

\* **2013 to 2017 Budget in** \$0  
**Thousands-**

\* **Authorization-**

\* **Appropriation-**

## 2012 Capital - Enterprise Shared Services

<b>Project Name</b>	IGS Phase 2
<b>Project Number</b>	
<b>Work Plan Category</b>	Reg - Agency Mandated
<b>Priority</b>	
<b>Project Manager</b>	Peter Carnavos
<b>Project Engineer</b>	
<b>Budget Reference</b>	8XC9703
<b>Project Status</b>	
<b>End Date</b>	Dec 31 2012
<b>ERM Addressed</b>	Admin Risk 30 Breach of Purchasing or Financial Transaction Integrity, Admin Risk 07 Penalty for FERC Violations, Admin Risk 17 Miscalculation of Purchased Power and Fuel Costs

**Work Description:**

Energy Management's wholesale gas purchasing and accounting functions have undergone process change as a result of the implementation of new computer systems. The Integrated Gas Supply system (IGS) has replaced the old GASMIS system as the tool to support physical gas purchasing and accounting. The Allegro Risk Management system (Allegro) replaced existing spreadsheets and smaller systems as the tool to support financial gas hedging and accounting. IGS is a SOX system, wherein the Company recognizes an average of approximately \$1 billion dollars or more annually in natural gas purchases. The project plans to address mitigating risks in financial reporting accuracy, GRT tax liability, FERC "Shipper Must Have Title" (SMHT) and system reliability.

The intent of the IGS Phase 2 Enhancement project is to further expand the functionality of the initial IGS implementation during 2010-2011.

This project is a continuation of the IGS Phase 2 Enhancements project that was begun in 2009. Some enhancements have already been implemented in 2009 prior to the suspension of the project in Jan 2010. The items below reflect a scope change to add additional business functionality to the original scope, while removing some of the technical and architectural enhancements and removing those items already completed in 2009.

This project will implement two categories of enhancements:

**1. Enhanced Gas Purchasing Functionality.**

Introduce more transaction flexibility to allow schedulers to stream storage transactions to a specific customer group; allow storage pools to be served by multiple pipeline sources; develop ability to set transportation rates for pipeline interconnections; allow for deletion of unused transactions; allow for capacity release on storage contracts and allow for zero-cost supply exchanges and entry of miscellaneous payable/receivable items for asset management arrangements. These enhancements mitigate financial reporting error through system control and accounting rather than relying on miscellaneous out-of system adjustments in back-office operation. They also improve the accuracy of

identifying supplies subject to GRT and enhance FERC SMHT compliance.

## 2. Enhanced Gas Accounting Functionality

Enhance the Invoicing and Accruals functionality to support multiple billing agents for subsidiary counterparties; implement month-to-date functionality for key reports; enhance purchase order monitoring functionality; enhance the Billing Adjustment function to apply adjustments to proxy billing groups; develop controls and reports to monitor specific transaction types, such as asset management arrangements, that fall under different FERC rules than routine transactions; enhance existing and develop new reports detailing asset utilization and non-traditional gas activities, and add extended time period parameters for all IGS reports (e.g., quarterly, annual, multiple month, etc...). These enhancements reduce financial reporting error through system controls rather than miscellaneous back office adjustments and ensure proper regulatory reporting for various transaction types.

### **Justification:**

- Reduce financial reporting error risks associated with transactions and adjustments for which IGS' initial implementation did not include.
- Avoid penalty surcharges and administrative burden associated with the expiration or financial exhaustion of purchase orders by creating system generating warnings to contract administrators well in advance of require action deadlines.
- Decrease the risk of failing to identify transactions subject to GRT.
- Decrease the possibility for errors by reducing back office data entry and manipulation to a minimum.
- Improve control through automated reports, which are easier to audit and have better security features.

- \* Alternatives: if system changes are not implemented, manual processes will be required, which are more labor intensive, error prone and lack system controls.
- \* Risk of No Action: The risk of no action would be a greater exposure to reporting risk from non-system controlled transactions. Also, there is greater potential to fail to identify transactions subject to GRT. There is also greater risk of failure in completing the monthly closing process.
- \* Non Financial Benefit Explanation: The benefits of this project are the avoidance of errors that could result from manual workarounds and more accurate financial results reported each accounting cycle. The enhancements will also reduce penalties resulting from late invoice payments by affording better identification of purchase order expirations. They also ensure proper timing and payment of GRT liabilities.
- \* Technical Evaluation and Analysis:
- \* Project Relationships: This project may be impacted by the CENTS Replacement Project or the ERP/Finance Project if knowledgeable resources are diverted to provide support for those projects.

### **Current Status:**

This project has not started in Jan 2011 as expected. However, we

expect to start this project in 2011 after redefining the project scope.

**Current Working Estimate:**

The overall project will complete in Dec 2012, with interim milestone deliverables during various dates in 2011 and 2012 as the different items can be phased in as completed.

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$200	\$400	\$0	\$0	\$0	\$0	\$0	\$0	\$600

**Benefit: (\$000s)**

\* **2008 to 2012 Budget in Thousands-** \$600

\* **2013 to 2017 Budget in Thousands-** \$0

\* **Authorization-** • Authorization – This project has been authorized under budget reference number 8XC9703. Authorization for 2011 was 400K, and may need to be increased and have funds shifted to 2012.

\* **Appropriation-** • Appropriation – This project has been appropriated for \$400K under budget reference number 8XC9703. Appropriation needs to be increased by 200K.

## 2013 Capital - Enterprise Shared Services

<b>Project Name</b>	Henwood Upgrade and Replacement Phase 0
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Ivan Kimball
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	Admin Risk 30 Breach of Purchasing or Financial Transaction Integrity, Admin Risk 18 Prolonged Computing or Communication System Failure

**Work Description:**

This project includes a replacement for the current Ventyx/Henwood (Global Energy Decision) Electric Trading and Scheduling system. This project may also include the introduction of a new Electric Trading and Market Data Analysis Tool.

This Work Description and cost estimates will be defined in more detail after the completion of a Phase 0 assessment project that is expected to be completed in 2010 prior to initiation of this project.

The need for replacement or major system upgrade is both required and desirable. It is required since the Office 2003 and IE6 technology used by the current system is at end of life. The vendor Ventyx is terminating support for the current system in March 2012. In addition, the technologies used will cease to be supported by Microsoft in 2014. A replacement is also desirable based on changes in the vendor landscape, changes in the wholesale electric marketplace since the system was originally implemented 12 years ago, implementation of new systems in CECONY (such as Allegro), the difficulties of integrating with the current Henwood version, and the need to keep up with a supportable trading and scheduling system platform.

**Justification:**

- The current Ventyx/Henwood system software will not be supported by the vendor after March 2012.
- The technologies used by the current Ventyx/Henwood system software will not be supported by Microsoft in 2014.
- Energy Management's Electric Supply Department process approximately 3.5 billion dollars in wholesale electric transactions, and requires a supportable software platform to track and schedule energy transactions.
- Energy Management is a frequent area of audits, and requires strict compliance with SOX controls, and audit capabilities.
- Regulatory compliance. If the system ceases to work, we would likely have regulatory compliance problems.

- Planning for an upgrade is a prudent idea, to enable take advantage of industry best practices that are incorporated into the product based on input from other utilities and the marketplace.
- The current Ventyx/Henwood system is aging, and will become technologically obsolete in 2014. We are completing a Phase 0 evaluation in 2010 and anticipate a recommendation for a large multi-year project in 2012 and 2013.

- \* Alternatives: Implementing a replacement system is mandatory.
- \* Risk of No Action: The risk of no action would be a loss of vendor support for an old system, that supports critical SOX functions. If the system ceases to work, we would likely have regulatory compliance problems..
- \* Non Financial Benefit Explanation: The financial benefits of this project are in keeping up with new market opportunities, using a vendor supported software platform. In addition, there is a likely cost avoidance of fines and penalties resulting from errors made due to lack of proper systems to support Electric Supply's business practices.
- \* Technical Evaluation and Analysis: N/A
- \* Project Relationships: This system currently interfaces with the Allegro Corporate Risk management System, and CECONY's Pricing Database System (PDS), and the NYISOBILL Verification System. The impact on these systems is expected to be minor.

- Current Status:**
- Current Working Estimate (if applicable): This estimate is based upon the anticipated need for employees and contractors for a 24 month project.
  - Authorization – This project has not yet been authorized.
  - Appropriation – This project has not yet been appropriated

**Current Working Estimate:** This project is expected to span budget years of 2012-2013

**Funding: (\$000s)**

Funding Cost	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$1,000	\$1,500	\$0	\$0	\$0	\$0	\$0	\$0	\$2,500

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$1,000
- \* **2013 to 2017 Budget in Thousands-** \$1,500
- \* **Authorization-**
- \* **Appropriation-**

## 2013 Capital - Enterprise Shared Services

<b>Project Name</b>	PeopleSoft HR Payroll System Upgrade
<b>Project Number</b>	TBD
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	Madhu Reddy
<b>Project Engineer</b>	
<b>Budget Reference</b>	TBD
<b>Project Status</b>	Not Started
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	

### Work Description:

The maintenance and support for the actual Application is expiring in Dec 2012 with an additional 2 years of "Extended Support" (Dec 2014). With Extended Support (different from Sustained), Oracle will provide security, application patches and Payroll tax updates. Oracle will support these updates when we apply to our environment. However, we must pay additional money for "Extended Support". This fee for this is the current annual maintenance + 10% for year 1 (\$50k) and 20% for year 2 (\$100k).

Given the above Oracle timeline on support, the HR/Payroll support team is recommending that we begin to upgrade both the Application and PeopleTools. The HR/Payroll support team has analyzed the option to separate the upgrades (ie. upgrade PeopleTools first then at a later time, upgrade the application). However, based on Oracle Release notes and the support team's analysis, there are significant changes to PeopleTools that will have a direct impact on the actual Application. For example, the PeopleTools upgrade will impact the look/feel of the actual application, navigation changing, pages, etc. As a result, the support team recommends upgrading both the PeopleTools and the Application at the same time. This will also avoid significant duplication of work, such as software installation, analysis, build, and testing.

For any large ERP application, the upgrade will be complex and time consuming due to technology changes, application changes and the number of internal customizations. The new version of PeopleSoft HCM 9.1 Application includes some new functional changes in the each of the four major modules. Many of these functional changes will be beneficial to the Company. For example, within Payroll, Oracle is now delivering a Paysheet Load Proces (which we can now eliminate our home grown customization for this process) and a new Delegation feature for Time Approval.

The high level upgrade plan of PeopleTools & Application includes the following:

1. Hardware procurement and install (upgrade requires 64 bit servers)
2. Install the PeopleSoft and PeopleTools Software onto Test Servers
3. Functional workshops & Fit/Gap Analysis

4. Technical compare & Fit/Gap Analysis
5. Design the functional changes
6. Design the technical changes
7. Retro-fit impacted customizations
8. Build
9. System, Integration, Parallel and User Acceptance Testing
10. Change Management
11. Production Cut Over

Based on our experience with the application to date, along with information available from Oracle about the changes associated with the upgrades, the high level effort is 9 months. This is based on effort required which entail work (run upgrade scripts, conversion, build, testing) being done in series and in parallel.

In addition to currently two projects, ProjectOne, Logica there is a new project, Total Rewards project is initiated which is to be complete Jan 2013.

Due to the integration work required with Project One and Logica, and implementing the Total Rewards projects, scheduling this upgrade is a challenge. ProjectOne is now scheduled to go-live in July 2012, Logica in September 2012 (with a major enhancement in 2014 -Mobile Dispatch) and Total Rewards project in Jan 2013. As a result, the HR/Payroll support team will be fully engaged with these large ERP and Total Rewards projects at least six months before and about 2-3 months after their go live dates. Given this situation and with support for PeopleTools ended on 9/2011, the HR/Payroll support team is recommending that we purchase and install the hardware and software and perform some preliminary work in 2011-2012 and then complete the upgrade in 2013 (after Project One/Logica/Total Rewards live).

**Justification:**

\* Alternatives: Due to the need to obtain mandatory tax updates and support, the Company must perform the upgrade. However, we have some flexibility on “when” to perform the upgrade. If we go beyond the PeopleTools Sept 2011 Sustained Support, then there will be significant risk to operating the system without support from Oracle.

\* Risk of No Action: If we don't upgrade, the Company will lose support and maintenance from Oracle along with the significant initial investment for the application (\$35m), along with the \$550k we pay in annual maintenance fees. Also, not upgrading will pose a significant risk by not having the required security patches, application patches and mandatory tax updates for Payroll.

PeopleTools (8.49):

- o Our current support support ends in Sept 2010
- o Oracle is offering “Sustained Support” for PeopleTools for 1 additional year (Sept 2011)
- o Although there is a small risk with Sustained Support since it does not

include the following: new updates, fixes, security alerts, data fixes, and critical patch updates, new upgrade scripts, Certification with new third-party products/versions.

HR/Payroll Support team does not feel the above items poses a major risk to our ability to support the system. However, we must update before the end of Sustained Support (9/2011) because Oracle will not commit to supporting any production issues we encounter. Since go live (Jan 2009), we have encountered four issues with PeopleTools. Three out of those four issues were critical (ie. employees could not view the pay checks and/or emp could view other employees paychecks, employees could not report time, security/access issues and most recently, employees could not login to the system through Homenet).

HR/Payroll Application (PeopleSoft HCM 9.0):

- o Our current support support ends in Dec 2012
- o Oracle is offering "Extended Support" for the Application for 2 additional years (Dec 2014)
- o Oracle will charge for "Extended Support" which is the annual maintenance fee + 10% (year 1) and 20% (year 2).

Scheduling –

- o PeopleTools needs to be upgraded by 9/2011
- o Application needs to be upgraded by 12/2012 (to avoid additional costs)
- o eBS project is scheduled to go-live in July 2012
- o Logica/WMS project is scheduled to go-live in September 2012
- o Total Rewards project is scheduled to go-live Jan 2013

Given this situation, recommendation is to upgrade after eBS, Logica/WMS and Total Rewards projects are in Production.

- \* Non Financial Benefit Explanation: Upgrades are required to keep current with the proper Oracle support as well as Payroll Tax updates.
- \* Technical Evaluation and Analysis: PeopleSoft is a vendor product but all upgrades will require a review/analysis of the impact to existing customizations.
- \* Project Relationships: Schedule is highly depended on Project One timeline and Logica/WMS as both the systems are significantly integrated.

**Current Status:**

**Current Working Estimate:** 2011: \$ 965,000  
 2012: \$ 832,000  
 2013: \$ 415,000  
 Total Cost: \$2,212,000

Note: Based on the recent development with Oracle support for Unix Servers with Itanium processors, ConEd is planning a new corporate recommendation/policy to buy only certain servers. If that policy makes it more expensive for us to buy servers; then our hardware estimate for 2011 might require a revision.

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$965	\$0	\$1,247	\$0	\$0	\$0	\$0	\$0	\$2,212

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$965
- \* **2013 to 2017 Budget in Thousands-** \$1,247
  
- \* **Authorization-**
- \* **Appropriation-**

## 2013 Capital - Enterprise Shared Services

<b>Project Name</b>	GridOps Load Forecasting Enhancements
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	
<b>Project Manager</b>	John Blaskovich
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Apr 30 2013
<b>ERM Addressed</b>	

### 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. If the system ceases to work, we would likely have regulatory compliance problems.
- \* Non Financial Benefit Explanation: The financial benefits of this project are improved forecast reliability, cost avoidance, and obtaining vendor support.
- \* Technical Evaluation and Analysis:
- \* Project Relationships:

**Current Status:** This project has not yet started.

**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)**

Funding Cost	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$750	\$250	\$0	\$0	\$0	\$0	\$0	\$0	\$1,000

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$750
- \* **2013 to 2017 Budget in Thousands-** \$250
- \* **Authorization-** This project has not yet been authorized.
- \* **Appropriation-** This project has not yet been appropriated

## 2013 Capital - Enterprise Shared Services

<b>Project Name</b>	Total Rewards Programming
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - Strategic IT Enhancements
<b>Priority</b>	
<b>Project Manager</b>	Lucas Finco and Frank Malafronte
<b>Project Engineer</b>	Akram Ghaly and Madhu Reddy
<b>Budget Reference</b>	
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Mar 31 2013
<b>ERM Addressed</b>	

**Work Description:**

The Total Rewards implementation has been broken up into five Workstream Teams

- Health and Wellness
- Pension and Retiree Life Insurance
- Sick and Disability
- Vacation and Holiday
- Compensation

The HR/PY Support Team has been involved with each Workstream and have bundled the scope and requirements based on date the system changes must be available

- November 1, 2012 – All Open Enrollment related changes
- December 1, 2012 – Vendor interfaces and Retiree Health and Life Insurance
- January 1, 2013 – Sick, Vacation, and Holiday Time

The HR/PY Team and the IR Shared Services Support Teams will be working concurrently on their set of activities (define, design, develop, test, deploy and post production support) that will address the completion of this project. The chart below provides a summary of the expected completion dates, estimated hours and cost for each of these work streams. The timeline for all this programming activity is also provided.

**Justification:**

Total Rewards includes everything the employee receives resulting from the employment relationship provided by the employer that may be used to attract, motivate, and retain employees, including compensation, benefits, development and work environment. The project included:

- Analysis of “Current State” of CECONY, O&R and CEB Total Rewards programs and competitive practices and compare with marketplace, peer groups, and CEI companies
- Positions include officers, management and union employees
- Identify “Best Practices” for Total Rewards
- Recommend a “Future State” for Total Rewards programs:
- Attraction and retention of right employees

- Pay for performance
- Employee engagement
- Better management of costs and future liabilities
- Consistency between CEI Companies as appropriate
- Obtain executive decision
- Implement and communicate new plans

- \* Alternatives: None
- \* Risk of No Action: Changes already approved by the Board of Directors and communicated to employees.
- \* Non Financial Benefit Explanation:
  - Attract and retain employees
  - Be competitive with the median of peer group companies
  - Reflect up-to-date best practices among our peer group
  - Provide more choice and flexibility
  - Be valued and understood by employees
  - Provide consistent programs across CEI companies, as appropriate
- \* Technical Evaluation and Analysis: Cross-functional team with representatives of the CEI company worked with AON/Hewitt consultants:
  - ? Solicitation of employee input, including leadership interviews, employee focus groups, and multiple employee surveys, to assess the perceived value of the Total Rewards package
  - ? The benchmarking of current programs against a peer group of utilities and New York metro companies (for a list of companies, see slide 42)
  - ? Extensive review of alternative designs, measured with a consistent set of guiding principles, by a cross-functional team from different areas of the Company meeting weekly
- \* Project Relationships: HR Payroll Upgrade Project has been delayed until completion of this project. Proposed OH Integrated Data Management Platform/ Health Management System has been delayed pending completion of this project and reevaluation of work description

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	\$1,580	\$290	\$0	\$0	\$0	\$0	\$0	\$0	\$1,870

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$1,580

\* **2013 to 2017 Budget in**      \$290  
**Thousands-**

\* **Authorization-**

\* **Appropriation-**

## 2013 Capital - Central Operations/Construction

<b>Project Name</b>	2013 Mgmt Work Flow Records Retention work with Law Records Retention
<b>Project Number</b>	N/A
<b>Work Plan Category</b>	Strat - Strategic IT Enhancements
<b>Priority</b>	8
<b>Project Manager</b>	Babette Orenstein / Alvarez, Franklin
<b>Project Engineer</b>	
<b>Budget Reference</b>	
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	Admin Risk 23 Illegal Acts for Personal Gain by BOD, Admin Risk 27 Breach of Company IT Security or Confidential Data, Admin Risk 25 Improper Evaluation of Acquisitions or Projects

### Work Description:

The Law Department and Construction will be collaborating on the implementation of a Records Manager's online retention policy via the use of the IBM Enterprise Document Management System. Construction will commit their operating documents as outlined in the Law Department's Retention Policy document into the document management repository. These documents will be versioned and controlled as per the document management configuration and retention policy.

The goal of Con Edison's current records management initiative is a consistent, user-friendly, and defensible program that promotes compliance with the Company's many state and federal legal and regulatory retention obligations. The main regulatory provisions governing the retention of Con Edison's records are those of the Public Service Commission ("PSC"), codified at 16 NYCRR §§ 733.10 and 733.15, and the Federal Energy Regulatory Commission ("FERC"), at 18 C.F.R. § 125.3.

---- Impact Note ----

This is in flight project and is the final phase of the records retention / Iron Mountain Integration.

### Justification:

This will ensure the proper retention period for documents. It will assist in the reducing the costs for off site storage in Iron Mountain. It will ensure that Construction is compliance with the record retention policy as outlined in the corporate retention policy document. It will assist in the tracking documentation for layout/project related activity.

\* Alternatives:

- \* Risk of No Action:
- \* Non Financial Benefit Explanation:
- \* Technical Evaluation and Analysis:
- \* Project Relationships:

**Current Status:**

We are in the process of meeting with the Law Department and performing benchmarking with other utilities to assess the best configuration for the implementation of an automated Records Retention Policy.

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	100	0	250	0	0	0	0	0	350

## 2013 Capital - Central Operations/Construction

<b>Project Name</b>	2013 / 2012-Construction – Survey Mapping Repository
<b>Project Number</b>	002
<b>Work Plan Category</b>	Strat - Strategic IT Enhancements
<b>Priority</b>	3
<b>Project Manager</b>	Robert Davis
<b>Project Engineer</b>	Lenny Burshtein
<b>Budget Reference</b>	6xc1304
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Dec 31 2014
<b>ERM Addressed</b>	

### Work Description:

Implement a Survey Mapping Repository for the electronic storage of Survey field data to make it available for the mapping of Company assets, structures and field survey data. This will make a wealth of digital Survey information available across departments.

The Survey Department performs work for the following groups:

- Electric Operations
- Gas Operations
- Steam Operations
- Transmission Operations
- Substations Operations

A sample of Survey data to be archived for future use includes:

- Survey of Transmission Towers, Substations, and Underground Transmission Feeders
- Substations 3D Laser Scanning
- Distribution Engineering - Poles and Manholes
- Gas Leaks Survey
- Gas Facilities Inventory
- Gas Aerial Photography

Benefits:

- Establishment of digital landscape of all survey activity
- Reduce Test Pits Requests (data stored and retrievable)
- Feed to Asset Management System
- Interaction with New York City GIS
- Interaction with New York State GIS
- Ability to display Wetlands, Tax, Parcel Data, and Paving Schedules
- Will facilitate review and optimization of the Construction Survey Process.

This implementation will include Microsoft's SQL Database server with the full ESRI Suite of Mapping products. This is the same platform used by New York City, New York State and Information Resources.

**Justification:**

This new system will enable Construction to share Survey field information with other CECONY organizations. Survey will catalog the information in order to provide an indexed repository of all work performed. This information will be viewable by end users. This will provide a real time visual representation of work being performed and will lower reproduction costs and the number of Survey requests for redundant information.

This will enable users to visualize survey grade information on real time, coordinate-based information for Company assets.

- \* Alternatives: Continue to store information locally.
  
- \* Risk of No Action: The Construction Survey group will need to stop digital electronic surveying since there will be no place to store and retrieve the data. Survey will not be able to take advantage of the current electronic asset repository. This highly sensitive information will be kept in paper files with cumbersome methods for retrieval analysis and audits.
  
- \* Non Financial Benefit Explanation: The system will render 3D Survey grade and GPS mapped representation of assets added to the CECONY network. This will enable better location of structures for mark outs and maintenance work.
  
- \* Technical Evaluation and Analysis:
  
- \* Project Relationships: Enterprise Mapping, Work Management

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	700	250	0	0	0	0	0	0	950

## 2013 Capital - Central Operations/Construction

<b>Project Name</b>	2013 / 2012- Upgrade and Enhance the Contractor Oversight System to Improve Business Process
<b>Project Number</b>	
<b>Work Plan Category</b>	Oper - Critical Repair
<b>Priority</b>	1
<b>Project Manager</b>	Mary Kelly
<b>Project Engineer</b>	T.Gentile / R.Davis
<b>Budget Reference</b>	XC1304
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Aug 2013
<b>ERM Addressed</b>	Admin Risk 19 New Project Construction or Operating Incident Imprudent Acts

**Work Description:**

Enhance the Contractor Oversight System (COS) to enable the collection of more meaningful field data. This includes the modification of the bid multiplier calculation so it has a stronger impact on the bid selection process based on the contractor performance. Upgrade the Contractor Oversight System (COS) database to SQL Server 2008 in order to be on a supported database platform when extended support for SQL Server 2000 ends in April 2013.

**Justification:**

The Contractor Oversight System (COS), implemented in April 2004, is a corporate system utilized by Purchasing to evaluate contractor performance. Inspectors enter field observations on a contractor's performance for a given purchase order. The system then uses this and other input to calculate a performance score and associated bid multiplier.

The database must be upgraded to SQL Server 2008 before April 2013, which is the end of Microsoft's extended support period for SQL Server 2000. After April 2013, Microsoft will no longer provide security updates for SQL Server 2000, potentially exposing corporate data and assets to security breaches which could ultimately result in the system being taken offline. In addition, newer versions of SQL Server deliver improved security, performance, availability, and monitoring. Microsoft will provide extended support for SQL Server 2008 through January 8, 2019.

As COS has matured and data has been collected, the business areas using the system have identified several enhancements that

will improve their business process and ability to evaluate contractors more effectively:

- Eliminate “Purchase Order Owner” algorithm weighting so that all Contractor Evaluation Reports (CERs) created for a purchase order have equal weighting.

- Change the Environmental, Health & Safety (EH&S) component of the Contractor Evaluation Reports (CERs) to allow for direct manager input versus automatic generation from Contractor Field Observation Reports (CFORs).

- Modify the relative weightings of the five categories on the Contractor Evaluation Report (CER) based on COS improvement team recommendations.

- Simplify the bid multiplier algorithm including how many Contractor Evaluation Reports (CERs) are required to generate a bid multiplier and how far the look-back should be on spot buys and blanket purchase orders.

- Create a report card on how many Purchase Orders required a Contractor Evaluation Report (CER) and did not have one completed, additional reports such as; Infraction Reports (IRs) and Action Lines (ALs) not completed, the percentage of Contractor Field Observation Reports (CFORs) with unsatisfactory findings, etc. This report card will be sent to the operating groups so that they are aware of where their Contractor Oversight System usage is not sufficient.

- \* Alternatives: Keep the current manual system which offers little distinction in the evaluation of good and bad performers.
- \* Risk of No Action: This is an important project with regard to company vendor oversight. The team has reviewed the Contractor Oversight System and provided direction on required changes to provide transparency to contractor observations, Bid Multiplier, departmental report cards and increased reporting.  
  
Due to the termination of support from Microsoft for SQL 2000 Database Server after 2013 , we will not be able to receive security and patch updates for the Microsoft SQL Server product if it is not upgraded.
- \* Non Financial Benefit Explanation:
- \* Technical Evaluation and Analysis: The changes to the SQL Server database are required. The changes to the reports and formulas will give increased visibility to poor contractor performance
- \* Project Relationships: PMS, Logica

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2012	2013	2014	2015	2016	2017	2018	2019	Total
	580	150	0	0	0	0	0	0	730

## 2013 Capital - Central Operations/Construction

<b>Project Name</b>	2013-2012-2011 Misc IT CEES integration Bid Check Estimate, Appropriations
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - Strategic IT Enhancements
<b>Priority</b>	7
<b>Project Manager</b>	Ptaszkowski, Fred
<b>Project Engineer</b>	N/A
<b>Budget Reference</b>	6XC1304
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Dec 31 2014
<b>ERM Addressed</b>	Admin Risk 27 Breach of Company IT Security or Confidential Data, Admin Risk 25 Improper Evaluation of Acquisitions or Projects, Admin Risk 35 Unsupported Computer Systems

### Work Description:

This project was deferred into 2013 due to the funding requirements for the Facilities Gowanus Project.

Information Resources (IR) will provide a Phase Zero Analysis for a new Con Edison Estimating System to replace the Central Engineering Estimating System (CEES), which is currently a legacy mainframe system. The current CEES system is used by Con Edison estimators to create a construction project cost estimate. The Company compares internal estimates to bids submitted by external construction companies. The system provides control information, allowing supervisory review of estimates in progress for various operating areas that require estimates for construction activity.. The Phase Zero Analysis will identify all the users of the estimating system, their business process, their particular data needs, and their functional requirements. CEES contains a wealth of historical information that includes previous bid check estimates. An inventory of all estimates in the current system will be provided in the new estimating system after verification by the creators for validity.

The design concept for the rewrite will include comparable functionality that exists today in the current system and all functional historical estimates will be available in the new system.

The existing CEES system was developed in 1991 and is a mainframe- based application that was developed with tools that are no longer supported by the vendor or IR. If the system experienced a major problem, repairing it would be difficult due to the complexity of dealing with unsupported mainframe software,. We therefore have to migrate the system to a more contemporary client-server, or web-based environment which can be supported.

---- Impact Note-----

This project will include recommendations for a solution from the Phase Zero Analysis performed by IR. This project directly impacts bid estimates, historical Construction estimates, Engineering estimates, and Gas and Electric estimates.

**Justification:**

The current CEES system contains historical estimates on various Construction work. The information is valuable for the creation of accurate estimates. The new Con Edison Estimating System can be used by all groups in providing accurate estimates with proper electronic interfaces for material, labor and equipment updates. Currently, this information is being updated manually with great effort to assemble the required updates.

CEES is no longer supported by Information Resources or the software vendor. CEES supports a major business process and action to remediate should be considered in order to provide proper and timely information for the estimates.

- \* Alternatives: The alternative would be to do nothing. IR has performed system data backups and if the system were to fail the estimating groups would revert to the backup and perform new estimates manually via spreadsheets.
- \* Risk of No Action: The current system requires a technical upgrade. Software components of the system are not supported by IR or the vendor. The ability to use historical estimates is not efficient across the different estimating groups. Annual escalation increases associated with the General Contractors Association (GCA) for labor, material and equipment would have to be done manually which could lead to late updates and inaccurate estimates.
- \* Non Financial Benefit Explanation: N/A
- \* Technical Evaluation and Analysis: The current mainframe software is not supported.
- \* Project Relationships: Work Management. (Logica)

**Current Status:**

**Current Working Estimate:** N/A

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	162	20	275	250	0	0	0	0	707

## 2013 Capital - Central Operations/Construction

<b>Project Name</b>	2013,2012,2011-Misc IT Work Coordination Street Activity
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - Efficiency & Process Improvements
<b>Priority</b>	5
<b>Project Manager</b>	Dawes, Gerald
<b>Project Engineer</b>	N/A
<b>Budget Reference</b>	6XC1304
<b>Project Status</b>	In-Flight Project
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	Admin Risk 35 Unsupported Computer Systems

### Work Description:

This project was deferred in 2013 based on business requirements for the Gowanus facilities project that was fast tracked into this year.

The Construction Department will bundle street work from different systems within Con Edison, which can be viewed on a single electronic map. The information is compiled from the various commodity work tracking systems. Con Edison will share this information with NYC Department of Transportation (DOT). The DOT will provide Con Edison stipulation data and resurfacing plan data. This effort will reduce the number of times that we need to physically open any given street and reduce the total outage time.

Effective internal and external coordination has considerable operational, financial and broader 'political' benefits within New York City. The pilot initiative to evaluate a platform for effective coordination with the use of advanced mapping and work scheduling tools was started in the first quarter 2011.

The initial success of this effort lead to a more comprehensive effort that involved the integration of real time data from the various work planning systems.

This new functionality in the prototype will allow users to quickly and effectively view all work planned by commodity in a local area via a real time, integrated geo-spatial map of jobs and Con Edison assets.

The current pilot system tracks work across different Company work tracking systems:

- eTrac,
- Work Management System(WMS –Logica)
- CM Layout Tracking
- Permit
- Paving
- Somis
- ECS

The system will provide an integrated view of a single job across commodities in space and time. Users can drill down to relevant details of the jobs from the source systems if more information is required. This initiative was reviewed with the Work Management Team and will be used for the cross-departmental view of job information during their roll out.

**Justification:**

The ability to more effectively bundle work will enable Con Edison to improve efficiencies in the scheduling and conduct of work. Some of the benefits of the project are as follows:

- Improved relationship with the DOT
- Improve relationship with our customer base
- Display street restrictions or construction activity on a color coded map.
- Intelligent reasoning about which lanes and blocks are affected by specific work items or permits.
- Automatically import City Paving schedules and other street restrictions.
- Actively alert users to possible conflicts with other activity.
- Provide easily retrievable information on which departments have been working in each lane or block over a period of time.
- Carry out a local area "block search".
- View all permits, work and paving information on a block or lane.

Con Edison has negotiated a Utility Data Exchange Agreement with the DOT which will establish the protocol for exchanging data on work activities affecting city streets. The DOT's input will provide resurfacing data.

By importing the relevant data into the intelligent geo-spatial map, users will be able to visually plan work for all commodities geographically. Users will be able to select the local area of interest and immediately review the current schedule for all of the work in an area. System data / reports will be generated to support the review of the dates currently proposed for Con Edison work only or could include other activities such as City projects to support planning and coordination across systems, commodities and third party agencies.

- \* Alternatives: Upgrade Construction Mapping System with same intelligence or add module to Work Management System (WMS-Logica).
- \* Risk of No Action:
- \* Non Financial Benefit Explanation: Inability to effectively support the Utility Data Exchange Initiative. The Utility Data Exchange is an agreement between NYC DOT, Verizon and National Grid to share information
- \* Technical Evaluation and Analysis: Return to manual review of work to coordinate commodities.
- \* Project Relationships: Work Management (Logica), Mapping

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2010	2011	2012	2013	2014	2015	2016	2017	Total
	320	392	0	250	0	0	0	0	962

## 2013 Capital - Central Operations/Construction

<b>Project Name</b>	2013- Mobile Field Device Replacement Project
<b>Project Number</b>	
<b>Work Plan Category</b>	Strat - Efficiency & Process Improvements
<b>Priority</b>	2
<b>Project Manager</b>	Alvarez, Franklin
<b>Project Engineer</b>	None
<b>Budget Reference</b>	6XC1304
<b>Project Status</b>	Not Started
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	Admin Risk 18 Prolonged Computing or Communication System Failure, Admin Risk 23 Illegal Acts for Personal Gain by BOD, Admin Risk 35 Unsupported Computer Systems, Admin Risk 06 Legal Violations by Employees or Vendors, Admin Risk 19 New Project Construction or Operating Incident Imprudent Acts

### Work Description:

Replace the existing Mobile Field Office Tough book devices. Construction has over 200 inspectors for the field verification of street excavation projects, in New York City. The devices are used by Construction Inspectors at the work site for access to plates, job documentation and field verification of trenching items for payment. . The original devices were installed in 2007 as part of a initial capital program. The Construction inspectors provide oversight for approximately 500 million dollars of work per year. We would like to start the replacement in 2013 and finish by end of year. The project is to upgrade the existing system with new devices and allow for transmission and collection of data in a faster manner.

### Justification:

The current MFO devices are critical to operations from a project control basis, audibility and efficient payment process. The current devices are entering their sixth year of operation and are becoming less reliable with more data transmission failures. In addition, these devices will not be supported for repair in 2013. The devices will not support the new operating systems and forms that are being Developed for tablet type applications and the inclusion of photograph and video.

- \* Alternatives: Keep current devices until failure or return to manual paper process.
- \* Risk of No Action: The devices are used to provide an electronic trail of project activity, durations and dollars used to the project. This is important for transparency to the projects and audibility.
- \* Non Financial Benefit Explanation:

- \* Technical Evaluation and Analysis: Construction in conjunction with support from Information Resources has piloted the Samsung Tablets. These devices will work well in our street conditions and have the CPU power to process the new forms and operating systems. In addition, the photograph / video are exceptional quality.
- \* Project Relationships: Mobile Office, Compass

**Current Status:**

**Current Working Estimate:** The cost per device with peripherals and setup is 1350 x 200 devices = 270, 000 + overheads and update of applications..

**Funding: (\$000s)**

<b>Funding Cost</b>	2013	2014	2015	2016	2017	2018	2019	2020	Total
	325	0	0	0	0	0	0	0	325

<b>Project/Program Title</b>	Meter Data Management System
<b>Priority Number</b>	High
<b>Project Manager</b>	Larry Nardo
<b>Budget Reference</b>	1XC0200
<b>Status</b>	In progress
<b>Estimated Service Date</b>	On going
<b>Work Plan Category</b>	Strategic IT Development
<b>ERM Addressed</b>	Inaccurate Billing / Non-CSS Obsolescence

**Work Description:**

The Company completed implementation of the Meter Data Management System (MDMS) in 2010 to provide billing support for Mandatory Hourly Pricing (MHP) and Reactive Power (RP) customers with monthly demand in excess of 500 kW. During 2011 and 2012, functionality was added to support the billing of traction accounts, DR and Standby Service applications, and also to provide an interface with meters in the smart grid pilot in Long Island City.

The Company plans replacement of the MDMS application software and hardware to address obsolescence of the MDMS database server and provide for an upgrade of MDMS software to the latest version. This work will be performed in 2013. In subsequent years, work will be performed alternately to install and test hot fixes, service packs and patches so that all new functionality is backwardly compatible with that currently in place, and provide for full version upgrades where the entire software application is replaced in order to continue receiving the most current functionality, enhancements and vendor support. The Company plans minor upgrades and testing in 2014 and 2016 and full version upgrades and compatibility testing in 2015 and 2017.

**Justification:**

The Company has completed the first stages of implementation for its MDMS. The MDMS application software is continually modified by the product developer to provide for increased functionality and improved performance in response to industry needs. Improvements in the MDMS software platform are helping the Company keep pace with its growing population of MHP and RP-billed accounts and the increasing data requirements associated with DR customers. In addition, the Company must update the MDMS components as necessary to ensure vendor support and current functionality.

**Estimated Completion Date:**

Ongoing

**Status:**

Ongoing

**Funding (\$000): Capital**

<b>Actual 2007</b>	<b>Actual 2008</b>	<b>Actual 2009</b>	<b>Actual 2010</b>	<b>Actual 2011</b>	<b>Approved 2012</b>
-	-	-	-	\$2,287	\$300
<b>Forecast 2013</b>	<b>Forecast 2014</b>	<b>Forecast 2015</b>	<b>Forecast 2016</b>	<b>Forecast 2017</b>	<b>Total 2013-2017</b>
\$3,000	\$325	\$805	\$325	\$805	\$5,260

Historical elements of expense (EOE's)

<b>EOE</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Labor	\$	\$	\$	\$	\$ 372
*A/P	\$	\$	\$	\$	\$1,673
Other	\$	\$	\$	\$	\$ 242
Contingency					
<b>Total</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$2,287</b>

Forecast

<b>EOE</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Labor	\$ 382	\$ 90	\$ 185	\$ 100	\$ 185
*A/P	\$2,240	\$ 160	\$ 482	\$ 162	\$ 499
Other	\$ 378	\$ 75	\$ 138	\$ 63	\$ 121
Contingency					
<b>Total</b>	<b>\$3,000</b>	<b>\$ 325</b>	<b>\$ 805</b>	<b>\$ 325</b>	<b>\$ 805</b>

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

<b>Project/Program Title</b>	Business Continuity (Disaster Recovery)
<b>Priority Number</b>	High
<b>Project Manager</b>	Sebastian Cacciatore
<b>Budget Reference</b>	0XC1000
<b>Status</b>	
<b>Estimated Service Date</b>	
<b>Work Plan Category</b>	Reliability / Strategic IT Development
<b>ERM Addressed</b>	

**Work Description:**

The proposed improvement involves the implementation and installation of a redundant server cluster environment with near real time recovery capabilities. This environment will allow servers to replicate data across two physically diverse locations and recover data almost immediately when failures occur. The proposed improvement will mitigate server/application downtime through the implementation of server recovery and data replication technologies. Additionally, the proposed improvement design will include a robust storage area network (~SAN") to ensure files/data are backed up and stored to disk routinely for archiving and restoration purposes. The SAN technology that will be implemented has proven to be extremely useful in providing sound server recovery and restoration solutions. In the proposed server recovery solution, a failed server will be immediately recovered by a redundant like and kind server. Most importantly, this mechanism will be transparent to server users. This solution will also address existing points of failures that exist today in the computer network wiring infrastructure.

**Justification:**

The Call Center business continuity plan requires the Company to improve its means to provide continued service to our customers in the event of a loss of Call Center infrastructure, including server computing resources and facilities. The existing Call Center LAN server architecture is not redundant and lacks a robust disaster recovery implementation. Failure of a given server will prevent all users connected to the server, including CSRs, from accessing information that is necessary to handle and process customer inquiries and emergency transactions. During most server outages, users remain out of service until the server problem is corrected. Typically, the restoration process requires at least six hours, which could hamper our ability to assist customers during an emergency period when they need us to be available and have access to essential information.

**Current Working Estimate (if applicable):**

**Funding (\$000): CAPITAL**

Actual 2006	Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011
	-	-	-	\$434	\$815

Budget 2012	Request 2013	Request 2014	Request 2015	Request 2016	Request Total 2012-2016
\$0	-	-	-	-	\$0

<b>Project/Program Title</b>	Cycle Meter Reading Handheld System
<b>Priority Number</b>	High
<b>Project Manager</b>	Salvatore Pannitti
<b>Budget Reference</b>	9XC9804
<b>Status</b>	In Progress
<b>Estimated Service Date</b>	2012
<b>Work Plan Category</b>	Productivity / Process Improvement
<b>ERM Addressed</b>	PSC Penalties

**Work Description:**

The Company must replace its current cycle meter reading system and handhelds before 2012 to ensure continued timely billing of its customers. The Company has been advised by the vendor that the system will not be supported beyond 2012. The Company will replace the current cycle meter reading handheld system with a new system. Replacing the current cycle meter reading handheld system will involve the purchase of approximately 470 handheld devices, 470 desk-based docking stations and compatible software. A one-year warranty for the handheld devices and docking stations will be included.

New internal hardware such as servers and desktop computers will also be purchased. It is estimated that 4 servers will be required to support the meter reading applications and 24 desktop PCs and monitors to be used by dispatchers throughout the Company system. In addition, a system interface is required to integrate the Company data with the cycle meter reading system software.

**Implementation Schedule**

January 2011 - Issue RFP  
February 2011 - Select Vendor / Award Contract  
March – May 2011 - System Design / Integration / Testing  
June – December 2011 - Conversion to New System

**Justification:**

The Company was advised by its current vendor that the existing cycle meter reading system and handhelds will not be supported after 2012. Replacement of the cycle meter reading handheld system beginning in 2011 was critical to ensure uninterrupted timely billing of our customers. The new system will provide us with the ability to read conventional and AMR meters with a handheld device or mobile collector installed in a vehicle, and delivers these readings into the Company's Customer Service System. The system also enables route restructuring at the local level for the purpose of maintaining efficient routes.

**Estimated Completion Date:** 2013

**Status:** In progress

**Funding (\$000): CAPITAL**

Actual 2006	Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Actual 2012
	-	-	\$	\$	\$2,572	\$1,864

Budget 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Total 2012-2016
\$1,700	\$300	-	-	-	\$2,000

<b>Project/Program Title</b>	Steam Billing System and Customer Service Enhancements
<b>Priority Number</b>	High
<b>Project Manager</b>	Vinnie Marketta
<b>Budget Reference</b>	1XC9809
<b>Status</b>	In Progress
<b>Estimated Service Date</b>	July 2011 – December 2013
<b>Work Plan Category</b>	System Enhancement/Process Improvement
<b>ERM Addressed</b>	Increase in UB & Billing Accuracy

**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	Actual 2012
-	-	\$	\$	\$244	\$1,059

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					
<b>Total</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$ 244</b>

## Forecast

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

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

<b>Project/Program Title</b>	On Bill Recovery
<b>Priority Number</b>	High
<b>Project Manager</b>	Michael Murphy
<b>Budget Reference</b>	1XC9812
<b>Status</b>	In Progress
<b>Estimated Service Date</b>	12/31/12
<b>Work Plan Category</b>	Regulatory Requirement
<b>ERM Addressed</b>	

**Work Description:**

Pursuant to the Power New York (“PNY”) Act of 2011 (L. 2011, c.388), the New York State Energy Research and Development Authority or its designated agent (“NYSERDA”) will administer a loan program for qualifying residential and non-residential customers for the installation of energy efficiency measures on a customer’s property. Installments for such loans will be shown on and collected through the customer’s utility bill. To implement the billing and collection of loan installments on customer bills, the Company must develop and implement system modifications and new business processes. System processes must be developed to exchange data with the loan financing party, record loan information on customers’ accounts, generate loan installments on a monthly basis, present loan installments on customer bills, allocate payments between utility charges and loan installments, integrate loan installments into credit and collections processes, and disburse funds to the loan financing party.

**Justification:**

The Company has been ordered to implement OBF as part of the Green Jobs - Green New York Loan Installment Program pursuant to the Power NY Act of 2011 (L.2011, c. 388). Under this statewide initiative, residential and non-residential customers will be eligible for NYSEDA loans for qualified energy efficiency projects on their properties. The loan installments will be shown on and collected through customers’ utility bills. Implementation of the program requires development of a number of complex business processes, modifications to the Company’s Customer Services System (CSS) and development of additional supporting processes.

**Estimated Completion Date:** Ongoing

**Status:** In progress

**Funding (\$000): CAPITAL**

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012	Actual 2012
-	-	-	-	\$247	\$1,000	\$917
Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Total 2013-2017	
\$500	-	-	-	-	\$500	

**Funding (\$000): O&M**

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

Approved 2012	Forecast RYE 2014	Forecast RYE 2015	Forecast RYE 2016	Forecast RYE 2017	Forecast RYE 2018	Forecast Total 2014 – 2018
	\$106	\$108	\$110	\$112	\$114	\$550

Historical elements of expense (EOE's)

<b>EOE</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
Labor	\$	\$	\$	\$	\$ 158
*A/P	\$	\$	\$	\$	\$
Other	\$	\$	\$	\$	\$ 89
Contingency					
<b>Total</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$ 247</b>

Forecast

<b>EOE</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Labor	\$ 174	\$	\$	\$
*A/P	\$ 175	\$	\$	\$
Other	\$ 151	\$	\$	\$
Contingency				
<b>Total</b>	<b>\$ 500</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

**Capital – Business Unit/ Division**

<b>Project/Program Title</b>	Walk-in- Center
<b>Priority Number</b>	High
<b>Project Manager</b>	Zoryana Gavrilova
<b>Budget Reference</b>	
<b>Status</b>	New
<b>Estimated Service Date</b>	2012
<b>Work Plan Category</b>	Regulatory Requirement
<b>ERM Addressed</b>	

**Work Description:**

The existing PSC order requires that the company maintain a walk-in-center in each borough and Westchester. The current lease at Fordham Road, Bronx, NY expires on August 27, 2012. Since the beginning of the year, the company has attempted to renew the lease with the landlord with no success. The landlord remained uncommunicative for several months at which time the company proactively engaged a broker to review other spaces. In June, the landlord informed the company that the Fordham space would no longer be available for lease renewal. The landlord offered another space at almost triple the current cost per sq ft with no assistance to build out the new location to make it suitable for business. The new landlord has offered to design the new location per specification and share the cost. These costs identified are the estimated net costs after landlord sharing. The location at 1775 Grand Concourse will be available in about four months once the lease is signed with more efficient systems and equipment.

**Justification:**

Build-out of a new walk-in-center in the Bronx. The new location will have a new HVAC system, two ADA and code compliant bathrooms, security system. Customer Service Representative work-stations, an ambassador station, area for customer lines, courtesy phones and space to house 10 kiosks as payment processing will be fully automated. The space will also include supervisor offices, a break-room, a Lan room and storage space. The new location at 1775 Grand Concourse will ensure the company meets the conditions of the March 2001 Joint Proposal and Order from the New York State Public Service Commission, that the company must maintain a Walk-in-Center in the Bronx where customers can transact business in person and must be accessible by public transportation. In accordance, the B and D trains are outside the building at 1775 Grand Concourse and the #4 train is two block away. Three bus lines also run along the Concourse. The company will also abide by the PSC Agreement to keep the existing and new locations open concurrently for a period no less than 30 days.

**Estimated Completion Date:** March 2013

**Status:** New

**Funding (\$000):**

Funding for this project has been approved by SAC for \$1,200,000.

**Funding (\$000): Capital**

<b>Actual 2007</b>	<b>Actual 2008</b>	<b>Actual 2009</b>	<b>Actual 2010</b>	<b>Actual 2011</b>	<b>Actual 2012</b>
-	-	-	-	-	\$

<b>Forecast 2013</b>	<b>Forecast 2014</b>	<b>Forecast 2015</b>	<b>Forecast 2016</b>	<b>Forecast 2017</b>	<b>Total 2013-2017</b>
\$0	\$0	\$0	\$0	\$0	\$0

## 2013 Customer Operations

<b>Project/Program Title</b>	Intelligent Routing Information System (IRIS) Handheld Device Replacement
<b>Priority Number</b>	High
<b>Project Manager</b>	Salvatore Pannitti
<b>Budget Reference</b>	9XC9800
<b>Status</b>	Scheduled
<b>Estimated Service Date</b>	January 2013
<b>Work Plan Category</b>	Productivity / Process Improvement
<b>ERM Addressed</b>	Non-CSS

**Work Description:**

The Company must replace its current Motorola MC9097 handheld devices used in the IRIS application for non-routine and collection activities. These handheld devices must be replaced because the wireless communications network that supports these devices is being phased out and will not be supported beyond 2013. Once the network is phased out, the current handhelds will no longer be able to communicate. Due to this, replacement must be completed before 2013 to ensure continued utilization of handheld devices for these activities. Work involves the replacement of 355 devices and docking stations. This project also involves the replacement the Company's current collection receipt printers. These printers are close to 10 years old and are beginning to fail. The Company needs to replace these printers so that customers receive a receipt when making a payment to a CFR.

**Justification:**

The Company's wireless communication provider has advised its users that the network used by the Company to support its current handheld devices will be phased out in 2013. The replacement of the handhelds is necessary for the continued efficient operation of the non-routine and collections field forces in Field Operations. Replacement of receipt printers is needed to provide customers with a receipt when making payment to a CFR.

**Estimated Completion Date:** March 2013

**Status:** Scheduled

**Funding (\$000):**

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Approved 2012	Actual 2012
					\$994	\$1,014

Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Total 2013-2017
\$162					\$162

Forecast

EOE	2013	2014	2015	2016	2017
Labor	\$	\$	\$	\$	\$
*A/P	\$ 158	\$	\$	\$	\$
Other	\$ 4	\$	\$	\$	\$
Contingency					
<b>Total</b>	<b>\$ 162</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

## 2012 Capital - Electric Operations

<b>Project Name</b>	Facility Flush Improvements
<b>Project Number</b>	23199-08
<b>Work Plan Category</b>	Oper - System Capacity
<b>Priority</b>	
<b>Project Manager</b>	Bob DeNezzo
<b>Project Engineer</b>	Peter Chan
<b>Budget Reference</b>	1XB2203
<b>Project Status</b>	Ongoing
<b>End Date</b>	Dec 31 2013
<b>ERM Addressed</b>	

**Work Description:**

Permanent structures will be erected to shelter the unloading areas and wastewater treatment systems, which are presently located outdoors. Sheltering the unloading areas will improve employee safety by preventing freezing of walking/working surfaces, and will also serve to reduce disposal costs by minimizing the amount of rainwater that would otherwise be captured at the facilities during run-off. Sheltering the three wastewater treatment systems from harsh environmental conditions will help to improve component service life and may ultimately reduce maintenance costs by reducing the potential for weather-associated failures. This upgrade process began with the Farrington Street facility in Queens and construction started June 2012 and is scheduled to complete in October 2013. The total cost to construct, purchase equipment and commission the new facility is estimated at \$18.5 million. Upgrades at the remaining facilities will be targeted in future years, thereby minimizing operational impacts while distributing total funding needs to mitigate rate payer impact.

**Justification:**

Cleaning underground electrical distribution structures to remove accumulated debris is a critical-path element in the vast majority of our work activities. Solid debris and sediment regularly deposit in Con Edison's underground electric distribution structures through street run-off, and in-leakage from other sources such as water and sewer mains. These accumulated materials can impede access to distribution system components during routine as well as emergency conditions, create hazardous walking/working surfaces for our employees, and adversely impact work quality overall. Work quality can be impacted because dirt and debris, even very small amounts that enter a joint during splicing activities, can lead to premature failures. Also, accumulated solids on and around secondary components can obscure defects during inspections. Structure cleaning must be accomplished before most work activities, including emergency restoration, routine maintenance, and inspections, can begin.

The Company has four flush facilities, which are essential resources that serve to manage the waste generated during structure cleaning, while enabling Con Edison to maximize the vector truck fleet's availability to

perform cleaning of structures. These facilities managed the approximately 11 million gallons of water and 14,000 tons of solids that comprised the flush waste generated by our vector fleet during 2008. The 24/7 availability basis of these facilities, combined with their strategic location throughout the service territory, maximizes vector availability during unloading evolutions.

In an effort to provide continuous facility availability and operation, and to address the increasing waste stream throughputs that are presently stressing facility capacities, Con Edison is planning to upgrade the unloading areas at all four flush facilities, and replace the three wastewater treatment systems.

Three of the facilities are equipped with water treatment systems that filter water from the flush operation for discharge to the NYC DEP sewer system. Water for discharge is generated primarily via the following mechanisms: 1) drainage/drying of the wet material moved from underground electric distribution structures, 2) rinsing of vehicles at the facilities in accordance with requirements after unloading, 3) rinsing of unloading areas in accordance with requirements, and 4) precipitation from weather events that impact the facilities. The remaining facility does not have a treatment system and does not discharge to the sewer (a regulatory restriction was the original driver of this difference). It accumulates water in a large sub-surface retention basin that is emptied periodically for bulk transportation to a disposal facility.

- \* Alternatives:
- \* Risk of No Action:
- \* Non Financial Benefit Explanation:
- \* Technical Evaluation and Analysis:
- \* Project Relationships:

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$0	\$7,500	\$11,000	\$0	\$0	\$0	\$0	\$0	\$18,500

**Benefit: (\$000s)**

- \* **2007 to 2011 Budget in Thousands-** \$0
- \* **2012 to 2016 Budget in Thousands-** \$18,500
- \* **Authorization-**
- \* **Appropriation-**

## 2013 Customer Operations

<b>Project/Program Title</b>	Automated Meter Reading
<b>Priority Number</b>	High
<b>Project Manager</b>	Larry Nardo
<b>Budget Reference</b>	1XC0100
<b>Status</b>	In progress
<b>Estimated Service Date</b>	On going
<b>Work Plan Category</b>	Productivity/Process Improvement
<b>ERM Addressed</b>	Billing Accuracy / Inaccurate Billing / Increase in UB

**Work Description:**

Large scale installation of AMR has been proven to reduce meter reading costs. This project will continue the installation of saturated AMR in The Bronx where the cost benefit ratio is positive. This project will include approximately 275,000 electric and gas meters in the East Bronx. In 2013 the AMR program will expand to other areas of The Bronx to convert the remaining 450,000 meters. Following completion of The Bronx, the Company will begin deployment in other areas where there is a positive business case.

**Justification:**

Deployment of AMR throughout Westchester County, demonstrated that AMR is a cost effective technology that increases meter reading efficiency while significantly reducing human resources, the costs for vehicle maintenance and fuel, and accidents. AMR also reduces injuries associated with manual meter reading and customer inquiries related to meter reading. Further it provides customers with timely and accurate meter readings. These projects will save an estimated 86 human resources and improve on-cycle meter reading percentage to nearly 100%.

**Estimated Completion Date:** Ongoing

**Status:** Work is in progress

**Current Working Estimate** (if applicable):

**Funding (\$000): Capital**

Actual 2007	Actual 2008	Actual 2009	Actual 2010	Actual 2011	Actual 2012
-	-	-	-	\$16,047	\$15,829

Approved 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Total 2013-2017
\$15,572	\$17,900	\$17,500	\$18,100	\$17,100	\$17,100	\$87,700

**Historical elements of expense (EOE's)**

EOE	2007	2008	2009	2010	2011
Labor	\$	\$	\$	\$	\$ 3,224
*A/P	\$	\$	\$	\$	\$ 9,861
Other	\$	\$	\$	\$	\$ 2,962
Contingency					
<b>Total</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$16,047</b>

Forecast

<b>EOE</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Labor	\$ 3,422	\$ 3,780	\$ 4,020	\$ 3,780	\$ 3,780
*A/P	\$10,992	\$10,167	\$10,747	\$10,501	\$10,521
Other	\$ 3,486	\$ 3,553	\$ 3,333	\$ 2,819	\$ 2,799
Contingency					
<b>Total</b>	<b>\$17,900</b>	<b>\$17,500</b>	<b>\$18,100</b>	<b>\$17,100</b>	<b>\$17,100</b>

\* Note A/P requires further identification such as A/P – Contract Labor, A/P - Equipment Maintenance, A/P - Corrective Maintenance, etc.

## 2012 Capital - Central Operations/Electric Production

<b>Project Name</b>	22777-08 ER U7 Boiler Burner Replacement
<b>Project Number</b>	22777-08
<b>Work Plan Category</b>	Reg - Agency Mandated
<b>Priority</b>	
<b>Project Manager</b>	R. Ferris
<b>Project Engineer</b>	Z. Wolff
<b>Budget Reference</b>	7EP9805
<b>Project Status</b>	Ongoing Program
<b>End Date</b>	Dec 31 2012
<b>ERM Addressed</b>	

**Work Description:**

This project is to upgrade the firing system on East River's Unit 70 and is to include new low NOx burners with modifications to the burner front, the windbox, burner throat, air control equipment and fuel control equipment. Some boiler control alterations including BMS, DCS and combustion controls will be required for successful installation. The Upgrade will require the removal and replacement of the existing burner barrel and the burner throat. It will also require the modification to the windbox configuration and the installation of new damper and oil gun travel actuators. Coordinated control of these new devices will be achieved through the existing BMS, DCS and Combustion Control System.

**Justification:**

The replacement of the existing burners will allow for the completion of the BMS project by automating the dampers and oil gun travel thereby meeting NFPA proof of position recommendations. The burner replacement will provide remote and tighter control of combustion air allowing faster unit response and greater emission control and reduction. Replacing these burners also affords East River the opportunity to automate the travel of the oil guns which further reduces the risk of operators exposure to hot oil, steam or hot metal when manual removing or inserting oil guns.

Provide Reliable Service Project will maintain current level of steam and electric reliability by replacement of existing equipment with upgraded burners. Increase Energy  
 Increase energy efficiency Project will improve boiler efficiency by upgrading the combustion control of B70  
 Be Responsible Stewards of the Environment Directly improves emissions from B70  
 Reduce and Manage Risk East River RPN = 120  
 Improve Public Safety Supports the current level of safety for employees by replacement of existing equipment with upgraded equipment

\* **Alternatives:**

No installing this project will limit control of NOX, expose operators to hot oil and steam when manually removing the burner guns, and the current

installation is not in compliance with NFPA recommendations.

- \* Risk of No Action:
- \* Non Financial Benefit Explanation:
- \* Technical Evaluation and Analysis:
- \* Project Relationships:

**Current Status:**

**Current Working Estimate:**

**Funding: (\$000s)**

<b>Funding Cost</b>	2011	2012	2013	2014	2015	2016	2017	2018	Total
	\$600	\$4,470	\$0	\$0	\$0	\$0	\$0	\$0	\$5,070

**Benefit: (\$000s)**

- \* **2008 to 2012 Budget in Thousands-** \$5,070
- \* **2013 to 2017 Budget in Thousands-** \$0
- \* **Authorization-**
- \* **Appropriation-**