

BEFORE THE  
STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION

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In the Matter of  
Consolidated Edison Company of New York, Inc.

Case 08-E-0539

September 2008

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Prepared Exhibits of:

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**Exhibit\_\_\_\_(NJ-1)**

**List of Staff Information Requests**

<u>Staff Request</u>	<u>Exhibit page</u>
205	1
206	197
207	199
208	200
593	201
594	203
595	205
604	206

Company Name: Con Edison  
Case Description:  
Case: 08-E-0539

Response to DPS Interrogatories – Set DPS14  
Date of Response: 06/27/2008  
Responding Witness: Arthur Kressner

Question No. :205

Subject: Research, Development and Demonstration - 1. For all items listed under Exhibit\_(AK-1) for the three rate years, provide the following: a. description of each program; b. explanation as to why the program is needed; c. total funding allocated to this program as of the end of the 2007 rate year; d. total remaining funding estimated for this program as of the beginning of the 2008 rate year; e. a breakdown of how the funding listed in Exhibit\_(AK-1) was determined; f. justification as to why the level of resources is needed for funding; g. a description of the work to be done under each program; h. a tentative work schedule; i. a description of the progress made under each program to date; and j. a description of any change to the scope of the program from the last rate case (Case 07-E-0523).

Response:

**A) description of each program**

As indicated in Exhibit\_AK-1, the RD&D program is segregated into five (5) programs that include Administration, Institutional, Transmission, Distribution and Customer operations. The focus, goals and objectives are summarized for each area.

***Administration***

Administrative R&D support includes those costs relating to research performed by the Company that is not specific to a program area. Such efforts have widespread application and benefits throughout the Company and for customers. Other general R&D support includes administrative costs that support research and technical services in all other R&D program areas. This includes the salaries of the personnel in the R&D department, department's operating expenses and the cost of protecting the Company's intellectual properties through the patent process.

***Institutional Research Program***

***Areas of Focus***

- Worker and public safety
- Reduce costs/maintain competitiveness
- Reliability and availability

***Goals and Objectives***

- Pursue collaborative opportunities in technology development and emerging markets supported by a wide network of national and international partnering
- Create strategic alliances with customers and manufacturers to develop products, services, and energy-related solutions
- Identify, develop, and demonstrate new technologies and innovative concepts that have potential for providing major benefits in the use of energy while benefiting the environment
- Provide a comprehensive assessment of new and improved technologies that may revolutionize utility service, while responding to environmental, economic, and social constraints
- Stimulate, encourage, and participate with the academic community, government and industry in research serving the needs of electric utilities and their customers

The Company continues its commitment to industry-group R&D programs and actively participate in the decision-making process of such national organizations as EPRI, NEETRAC and CEA. For those projects that are of common interest to us and the industry, particularly on large demonstrations, once the basic research and proof of concept have been completed, we work well collaboratively with various utilities, industry, government and private organizations located outside the state or even outside the country. Con Edison's flexible R&D program allows us to take the risk associated with initial development of technologies of specific importance to us. Other entities may then be willing to help us fund demonstrations of operational systems. We have also found that manufacturers are not willing to undertake technology development on problems that are unique to us unless we are willing to fund the basic research and feasibility of proof of concept. This requires us to fund product development by ourselves or to look for partners with similar needs. These partners are most often outside of New York State. Sometimes we even need to look outside the United States to find similarities.

### ***Transmission Program***

#### ***Areas of Focus***

- Aging (high replacement costs)
- Condition monitoring systems
- Develop an oil-less cable system
- Worker and public safety
- O&M costs
- Capital costs
- Reliability and availability
- Environmental impact
- Data Collection and integration

#### ***Goals and Objectives***

- Minimize the environmental impact of dielectric fluid
- Maximize use of existing facilities

- Determine remaining life of existing cable system so that replacement strategies can be developed
- Develop replacement options
- Reduce O&M costs
- Maximize use of existing facilities
- Improve safety

The Transmission R&D program is directed toward improving the reliability, upgrading the capacity, and extending the life of Con Edison's underground and overhead transmission systems. R&D activities in the transmission program include: development of techniques and equipment to expedite detection and location of dielectric fluid leaks in high-pressure, fluid-filled cables; examination of the present and expected performance of 138-kV and 345-kV cable systems; seeking environmentally acceptable substitutes for the dielectric fluids currently used in large power transformer and cable applications; and implementation of state-of-the-art hardware and software to reduce O&M costs associated with transmission.

### ***Distribution Program***

#### ***Areas of Focus***

- Worker and public safety
- Environmental excellence
- Aging (high repair and replacement costs)
- Reliability, maintainability, productivity
- Emergency response time

#### ***Goals and Objectives***

- Improve worker health and safety
- Increase productivity
- Improve public safety
- Meet or exceed all environmental regulations
- Improve asset management
- Enhance system reliability
- Improve customer satisfaction
- Reduce costs/maintain competitiveness
- Improved data management

The Distribution R&D program focuses on developing, demonstrating and assisting in the early deployment of new technologies that will improve safety, system reliability and integrity, promote environmental excellence, and reduce O&M costs of construction, maintenance and operation of the distribution systems. R&D activities in the area of distribution include: stray voltage detection and mitigation; real-time fault location system for primary distribution feeders; performing advanced development at the Distribution Cable and Joint Cable Center of Excellence, with EPRI, to evaluate existing distribution assets and develop improved technologies, equipment and materials that can be used to replace aging infrastructure; developing a method of modeling and using real-

time conductor temperature for network feeder contingency ratings; exploring partial discharge detection as a diagnostic for incipient failures and other anomalies in distribution cable, joints and transformers; and developing sensors for detecting manhole gasses and other applications.

### ***EH&S Program***

#### ***Areas of Focus***

- Impact of environmental regulation on the Company's operations and customer businesses.
- Develop lower-cost, smaller-size, and more efficient, reliable, and environmentally acceptable equipment
- Minimize the environmental impact of dielectric fluid
- Worker and public safety
- Environmental excellence

#### ***Goals and Objectives***

- Develop lower-cost, smaller-size, and more efficient, reliable, and environmentally acceptable equipment
- Minimize the environmental impact of dielectric fluid
- Develop the next generation of solid cable systems to replace existing 345-kV oil-filled cables.
- Seek environmentally acceptable oil substitutes for large power transformer and cable applications.
- Develop SF6 equipment leak detection and repair systems.
- Reducing the company's carbon footprint
- Plug-in hybrid electric vehicle development and infrastructure

The EH&S research program seeks to reduce environmental impact of the Company on the environment. Our program also seeks to reduce environmental impact by furthering the development of SF6 laser-imaging cameras and leak sealing techniques, developing more environmentally acceptable pipe-type cable systems and dielectric fluids. We also aid in identifying the Company's operational impact on greenhouse gas emissions and investigate various new technologies to achieve reductions in CO<sub>2</sub> and other greenhouse gas emissions. Environmental research projects are also included as part of the research programs to which they apply.

### ***Customer Operations Program***

#### ***Areas of Focus***

- Customer satisfaction
- O&M Costs
- Services
- Need to increase the value of electricity to a wide range of customers
- Retention of economically robust customer base

- Need to develop strategies for better, more economical use of Company infrastructure through technology development and energy efficiency-related solutions

### **Goals and Objectives**

- Improve customer satisfaction
- Reduce costs/maintain competitiveness
- Link related data systems
- Integration of data collection
- Develop computerized management systems to improve operations.
- Develop improved Call Center operations systems
- Demonstrate un-metered services meter

The Customer Operations research program focuses on efforts to improve customer satisfaction and lower costs. Included are assessments and demonstrations of new technologies that offer improved load control, real-time pricing, non-intrusive analysis of customer load patterns, advanced remote meter reading and interactive communications with our customers.

### **B) explanation as to why the program is needed**

Our R&D programs have been segregated into the same or similar areas for many years and are working very well producing value for the company. While the program areas remain constant, the projects that comprise the program continually change as work is completed and new needs and opportunities are identified. We give special focus to projects that are unique to our service area and result in providing reliable and safe service to our customers. Many of the projects undertaken are to support specific operational needs. These projects tend to be shorter term, but have high potential value to the Company. We focus on the tools for the underground distribution system - such as manhole rejuvenation, stray voltage detection and mitigation, real time fault location systems, dielectric fluid leak location monitors, duct reclamation systems and advanced network switches. For the transmission system, developments include oil filled cable pump house enhancements and data acquisition systems, investigation of thermo-mechanical bending (TMB), asset management techniques, partial discharge location systems, circuit breaker monitoring, substation automation and on-line conditioning monitoring of power transformers. For other operating organizations in the Company, our program provides tools such as demonstration of advanced meter reading technologies and a customer-based risk collection analysis system to help streamline our operations and improve efficiencies.

With respect to long-range/strategic R&D, over the next decade and beyond, the Con Edison system will require continuing reinforcement and expansion of transmission, substation and distribution facilities. Conventional options using today's technology will become increasingly more expensive and impractical at the same time that new technologies will offer cost saving innovative alternatives. Con Edison has recognized these issues with the formation of the "3G" System of the Future Team. We have initiated targeted R&D projects including those addressing Smart Grid, fault current

limiting, and more environmentally acceptable pipe-type cable systems. Innovative solutions are needed to provide alternatives where the available commercial options are too expensive or impractical to implement. The resultant technologies, despite their relative higher costs, if successfully deployed, may have economic benefits. Success in this area is dependent, to a great extent, on a sound research, development, and demonstration (RD&D) program.

**C) total funding allocated to this program as of the end of the 2007 rate year;  
D) total remaining funding estimated for this program as of the beginning of the 2008 rate year;**

The attached Excel spreadsheet provides all the financial data requested for each electric R&D project that comprise the programs. It should be noted this is a snapshot of the R&D portfolio at this point in time. It includes all active projects that have had spending within the last five years. It does not include projects that are still in the conceptual stage and therefore have not been authorized for spending and have no status to report upon.

**E) a breakdown of how the funding listed in Exhibit\_(AK-1) was determined;  
F) justification as to why the level of resources is needed for funding;**

The funding estimates listed in Exhibit\_(AK-1) were developed using the experience of R&D professional staff in collaboration with the advice of Company operations personnel. Where possible, these estimates were formulated based on reviews of vendor proposals, outstanding vendor purchase orders and existing contracts to identify necessary funding levels of on-going and proposed projects. The goal is to match the needs of Company operations to opportunities for solutions using advanced technology. An analysis of candidate projects is made, with potential benefits being reviewed against financial resources required for successful development. The probability of achieving commercial success in a reasonable time is also considered, and other RD&D activities are reviewed for possible duplications. Emphasis is placed on projects that show near and mid-term benefits, as well as long term programmatic issues that directly impact Con Edison. . This general approach facilitates a comparison of various candidate technologies and aids in project selection and prioritization. The R&D annual budgeting process also factors in a need to balance the application of resources across the spectrum of potential application – such that longer-term R&D is not neglected.

**G) a description of the work to be done under each program;**

The attached Excel spreadsheet provides the objective of each project in the program areas. The attached status sheets also provide the description of the work to be done, and progress made under each project that has expenditures in 2007.

**H) a tentative work schedule;**

The attached Excel spreadsheet provides the date that the project was authorized (column D) and the expected completion date (column E)

In response to items (a) thru (e) attached is an Excel spreadsheet that provides all the financial data requested for each electric R&D project along with the project objective.

**I) a description of the progress made under each program to date**

The attached Word file contains the project status sheets, as of January 2008, for all projects that had expenditures in 2007.

**J) a description of any change to the scope of the program from the last rate case (Case 07-E-0523).**

There have been no changes to the scope of the programs listed in exhibit\_(AK-1) since the last rate case. This rate case continues the plan at the same level approved in Case 07-E-0523.

CSN	TITLE	Amount Authorized	Total spend to date thru April 2008	Total Remaining to be spent as of April 2008	Radpar Date	End Date	Actual Spending					2008 Budget	Estimates				OBJECTIVE	
							2004	2005	2006	2007	Thru April 2008		2008	2008	2009	2010		2011
<b>INSTITUTIONAL RESEARCH PROGRAM</b>																		
EPRI'S DYNAMIC ENERGY MANAGEMENT (ENERGY EFFICIENCY) INITIATIVE																		
92003	EPRI - ELECTRIC TRANSMISSION	\$ 145,000	\$ 132,780	\$ 12,220	2/26/2007	12/08	N/a	N/a	N/a	\$ 132,780	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	An assessment of how energy efficiency and demand response can affect demand and energy forecasting as well as transmission and distribution planning and operation including an assessment of methods for calculating the CO2 emission reductions is needed. The analytics is to provide ready -now support with emphasis on providing resources that enable a no-regrets strategy for utilities and regions that are now embracing or reinvigorating energy efficiency and demand response programs.
92069	EPRI FUNDING FOR ELECTRIC DISTRIBUTION AND CUSTOMER R&D	\$ 1,700,000	\$ 1,700,000		1991-01-01	Ongoing	\$ 1,071,952	\$ 1,391,208	\$ 1,391,208	\$ 1,363,381	\$ 482,075	\$ 2,200,000	\$ 2,200,000	\$ 2,200,000	\$ 2,200,000	\$ -	-	Membership in EPRI research and information programs provides current information on new electric research initiatives.
92071	CLIMATE SCIENCE - SYNTHESIS AND FUTURE WORK	\$ 1,500,000	\$ 1,500,000		1991-01-01	Ongoing	\$ 771,624	\$ 881,572	\$ 881,572	\$ 798,440	\$ 461,736	\$ 810,000	\$ 810,000	\$ -	\$ -	\$ -	-	Membership in EPRI research and information programs provides current information on new electric research initiatives.
92155	EPRI'S POWERSEC INITIATIVE	\$ 25,000	\$ 12,500	\$ 12,500	4/2/2008	04/10	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 12,500	\$ 12,500	\$ -	\$ -	-	We are experiencing gradual settlement of the structural pad under a 138kv circuit breaker and switch at Hudson Avenue East Substation. Engineers suspect that there is a void under the pad that could be filled or stabilized, if they knew where it was. We have experienced good results from ground penetrating radar surveys and imaging of our facilities under the streets of New York. However, that equipment is tuned to relatively shallow application - 6 - 10 feet. The objective is to engage Geo model to perform a deep scan survey. - Develop an overview of the electric power industry's current cyber security posture. - Provide utilities with a list of vulnerabilities for each major type of SCADA and EMS controllers commonly deployed across North America and tailor this information to the particular combination of systems that each participant uses. - Develop a comprehensive, prioritized list of viable cyber threats.
92277	POWER QUALITY PROJECTS WITH THE CANADIAN ELECTRIC ASSOCIATION	\$ 25,000	\$ 25,000	\$ -	11/8/2005	11/06	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	New and more cost effective avenues are needed to identify useful technologies, benchmark best industry practices, and broaden industry contacts of Con Edison's technical personal.
92288	GATEWAY RESEARCH AND TECHNOLOGY MANAGEMENT	\$ 150,000	\$ 60,173	\$ 89,827	4/25/2007	12/12	N/a	N/a	N/a	\$ 29,523	\$ 30,650	\$ 50,000	\$ 50,000	\$ 50,000	\$ -	\$ -	-	To do a feasibility study to determine if we can automate existing ESCO switches economically.
92493	FORUM NORTHEASTERN UNIVERSITY CENTER FOR ENERGY EDUCATION AND RESEARCH (NUEER)	\$ 45,000	\$ 3,047	\$ 41,954	9/24/2007	09/09	N/a	N/a	N/a	\$ -	\$ 3,047	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	\$ -	-	There is a shortage of electrical engineering students with a strong background in energy related topic. This membership is to develop and offer short courses on energy topics of current interest. Membership will provide us will access to all NUEER publications and student theses. We will also receive a 10% discount on short course fees and have representation on the NUEER industry advisory board.
92704	<b>SUBTOTAL INSTITUTIONAL RESEARCH PROGRAM</b>	\$ 25,000	\$ 10,000	\$ 15,000	9/13/2006	09/08	N/a	N/a	\$ -	\$ -	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ -	-	
		\$ 3,615,000	\$ 3,443,499	\$ 171,501			\$ 1,843,576	\$ 2,272,780	\$ 2,272,780	\$ 2,324,124	\$ 982,507	\$ 3,075,000	\$ 3,087,500	\$ 2,282,500	\$ 2,205,000	\$ -	-	
<b>TRANSMISSION PROGRAM</b>																		
INVESTIGATION OF THERMO-MECHANICAL BENDING (TMB) FAILURES																		
92030	PARTICIPATION IN THE CANADIAN ELECTRICITY ASSOCIATION TECHNOLOG	\$ 360,000	\$ 344,473	\$ 15,527	3/22/2000	05/08	\$ 10,118	\$ 65,957	\$ 65,957	\$ 76,525	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	-	To review the cause of recent failures on feeders M51 and 72 and determine if these failures are specific, localized cases or a new TMB failure mode has developed on 345kv feeders.
92051	PARTICIPATION IN THE CANADIAN ELECTRICITY ASSOCIATION TECHNOLOG	\$ 500,000	\$ 564,436	\$ (64,436)	6/28/2000	12/08	\$ 74,364	\$ 114,142	\$ 114,142	\$ 63,295	\$ 7,600	\$ 10,000	\$ 10,600	\$ -	\$ -	\$ -	-	CEA has been found to be a cost effective mechanism to increase industry contacts, benchmark Con Edison practices and develop new technologies that compliment other company R&D activities. The value of this effort is increasing, since other U.S. utilities, such as AEP, Bonneville Power authority, Central Hudson, Entergy, INEEL, NYPA, NYS Electric & Gas, Northeast Utilities, TVA, United Illuminating Authority and Duke are also starting to participate in this resource.
92070	PARTICIPATION IN EPRI "SUNBURST 2000" PROGRAM RELATED TO GEOMAG	\$ 250,000	\$ 222,860	\$ 27,140	7/1/2000	12/10	\$ (1,559)	\$ 22,000	\$ 22,000	\$ 7,580	\$ 24,558	\$ 20,000	\$ 24,550	\$ -	\$ -	\$ -	-	Participation in the EPRI Sunburst 2000 Network provides direct "real time" access via PC and email messaging to an existing network of sensors monitoring neutral ground currents that are Geomagnetically Induced (GIC) following solar mass ejections. In addition the reports and tools provided, and participation with the Sunburst utility user group will assist System Operations and Engineering to develop practical methods to Mitigate GIC events, which have in the past caused System trippouts and major transformer failures. The EPRI effort includes work in cooperation with NASA, NOAA and international utilities to improve GIC modeling, and provide earlier and more accurate alerts to member utilities.

EXPANDED USE OF PHYSICAL OPERATING MARGIN SOFTWARE																	
92116	SOLID STATE FAULT CURRENT LIMITERS	\$ 200,000	\$ 112,044	\$ 87,956	2/17/2005 12/08	N/a	\$ 49,375	\$ 49,375	\$ 30,000	\$ 25,000	\$ 100,000	\$ 100,000	\$ -	\$ -	-	<p>The project objective is to obtain, develop and apply additional Physical Operating Margin Software modules to Transmission Planning applications, and to increase System Operations' familiarity with the capabilities and functionalities with a view toward possible future use of -RT (real time) versions of this software by System Operations and other company organizations.</p> <p>Based on benchmarking with many of the densest urban load centers around the world, fault currents on the Con Edison system are among the highest in the world. This is primarily due to the widespread high-rise architecture resulting in very high load densities within New York City.</p> <p>In order to cope with these high fault currents a number of design strategies have already been incorporated into our standard design, including continuing breaker upgrade programs on both the transmission and distribution systems, the use of high impedance transformers in our area stations, impedance grounding of transformers and generators and selective application of high impedance series reactors.</p> <p>Increasing fault currents are a continuing problem that remains extremely difficult to deal with due to the following reasons:</p> <ul style="list-style-type: none"> <li>- Faults may occur at any location, requiring system wide programmatic uprate programs,</li> <li>- Con Edison's significantly higher fault currents in some cases require first-of-a-kind equipment development,</li> <li>- Post-Deregulation uncertainties in timing and location of new developer generation and transmission projects,</li> <li>- Generation developers tend to choose interconnection locations near fuel sources versus those best suited to power system needs,</li> </ul> <p>To develop robotic tools to improve inspection &amp; maintenance for metal clad bus.</p> <p>Transmission Line management is a continuing concern that warrants additional research and development in best practices and new products and concepts. This funding will enable collaboration with other utilities via the CEA (Canadian Electric Association) on projects to investigate, understand and mitigate Transmission line Issues.</p> <p>To develop a web-based real time automated system fault analysis system. Based on event driven or time schedule, the system will track DFR (Digital Fault Recorder) data and automatically generate necessary analysis report and post the result on the web within the required time frame accordingly.</p>	
92135	ROBOTIC BUS INSPECT/ BACKSCATTER SENSOR	\$ 4,000,000	\$ 2,036,897	\$ 1,963,103	1/12/2001 12/12	\$ 500,869	\$ 626,758	\$ 626,758	\$ 1,950	\$ -	\$ 700,000	\$ 700,000	\$ 400,000	\$ 400,000	\$ -	-	
92172	CEA - TRANSMISSION LINE ASSET MANAGEMENT PROJECTS	\$ 375,000	\$ 148,500	\$ 226,500	3/19/2001 12/06	\$ 80,000	\$ 29,500	\$ 29,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92183	RELAY PROTECTION AUTOMATED FAULT ANALYSIS	\$ 50,000	\$ -	\$ 50,000	5/5/2008 11/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	-
92198	DEVELOPMENT OF IMPROVED METHODS FOR CORROSION DETECTION OF PIPE	\$ 100,000	\$ 90,927	\$ 9,073	10/24/2004 04/08	\$ -	\$ 59,774	\$ 59,774	\$ 906	\$ -	\$ 65,000	\$ -	\$ -	\$ -	\$ -	\$ -	-
92205	DEVELOPMENT OF NEW TECHNIQUE FOR COMMISSIONING TEST OF TRANSMIS	\$ 275,000	\$ 247,534	\$ 27,466	3/27/1998 03/06	\$ 4,322	\$ 42,199	\$ 42,199	\$ -	\$ -	\$ 75,000	\$ -	\$ -	\$ -	\$ -	\$ -	-
92242	INTELLIGENT POWER INFRASTRUCTURE CONSORTIUM (IPIC)	\$ 315,000	\$ 201,524	\$ 113,476	8/24/2005 10/08	N/a	\$ 226	\$ 226	\$ 180,498	\$ -	\$ 70,000	\$ 92,650	\$ -	\$ -	\$ -	\$ -	-
92259	EPRI SUNBURST NETWORK GIC MONITORS (SPRAINBROOK & GOETHALS)	\$ 70,000	\$ 70,000	\$ -	9/23/2005 09/06	N/a	\$ 70,000	\$ 70,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92260	TRANSMISSION FEEDER INFRASTRUCTURE INFORMATION LINKING SYSTEM	\$ 200,000	\$ 53,112	\$ 146,888	4/9/2007 12/09	N/a	N/a	N/a	\$ 22,230	\$ 30,882	\$ 60,000	\$ 60,000	\$ 40,000	\$ -	\$ -	\$ -	-
92261		\$ 150,000	\$ 169,468	\$ (19,468)	9/26/2005 06/08	N/a	\$ 162,028	\$ 162,028	\$ 7,440	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-

Explore and demonstrate new tools and techniques for data and information access and utilization that would enhance the operation and performance of our Transmission Engineering, Operations and Design groups.

ADVANCED UT CONSTRUCTION PROJECT

This will be an EPRI co-funding project which includes the following main tasks:

1. Develop a manhole design for installing two circuits in common manhole with a barrier, zig-zag wall or other methods, allowing work on the de-energized line while the other line is energized.

2. Advanced designs of both duct and manhole to reduce the cost and increase the speed of UT construction.

3. Manhole covers designs will be evaluated to relieve the pressure during fault events.

92276	DISBONDED COATING DETECTION FOR UNDERGROUND PIPE	\$ 50,000	\$ 50,000	\$ -	11/4/2005 11/06	N/a	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-
92292	FEASIBILITY STUDY EVALUATION OF SATELLITE TECHNOLOGY FOR ROW INSPECTION	\$ 125,000	\$ 104,846	\$ 20,154	11/17/2005 08/08	N/a	\$ -	\$ -	\$ (14,691)	\$ 37	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	-	-	-	-
92305	EPRI LOAD MODELING PHASE II	\$ 50,000	\$ 15,000	\$ 35,000	5/4/2007 12/08	N/a	N/a	N/a	\$ 15,000	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	-	-	-	-
92315	EPRI VOLTAGE INSTABILITY LOAD SHEDDING	\$ 150,000	\$ 80,457	\$ 69,543	12/12/2005 12/07	N/a	\$ 80,000	\$ 80,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-
92319	138 KV Y-BRANCH JOINT TESTING	\$ 150,000	\$ 81,087	\$ 68,913	12/12/2005 12/07	N/a	\$ 80,000	\$ 80,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-
92326	GROUND SIGNATURE SYSTEM (GSS) ENHANCEMENT	\$ 336,000	\$ 326,741	\$ 9,259	12/14/2005 06/08	N/a	\$ 107,998	\$ 107,998	\$ 36,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-
92333		\$ 50,000	\$ 1,037	\$ 48,963	10/26/2001 04/09		\$ -	\$ -	\$ -	\$ 1,037	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-

Determine feasibility of a cable cleaning device to remove and contain asbestos during certain cable removal jobs. Periodic Right-Of-Way Inspections are required to assess the effectiveness and need for tree trimming, integrity of shield wires and support structures, identify new non-utility structures, which could reduce clearances or otherwise jeopardize power lines, assess the extent of damage following severe storms or events, and to identify and confirm flashover locations from lightning, avian, animal or wind blown debris. These inspections are labor and time intensive effecting resistance of structures and lines to events, and restoration and repair times for transmission and distribution assets.

The project will build upon work already completed work in EPRI's Phase 1 Load Modeling project. The effort includes collaboration with other major utilities to assure both the breadth of input and broad applicability of planned deliverables. Specific deliverables will include: a technical report comparing measured versus simulated system responses using packages including PSS/E, PSLF and Powertech's TSAT, as dictated by project participants. The Phase 2 effort will also deliver an executable software package that will interface the Load Modeling Parameter Derivation (LMPD) program developed under Phase 1 in a MATLAB environment to the more standard planning packages above. The Report and software will include methodologies to aggregate individual loads at the transmission level, and will specifically address impacts such as under-voltage tap changers, small, medium and large motors, including contactor drop-out and motor stalling characteristics, and provide a process to identify and apply the The project will build upon work already completed by EPRI that developed a Voltage Instability Predictor (VIP) algorithm, which uses local measurements to estimate voltage stability margin. This new effort will develop a hierarchical control architecture for coordinated wide-area Voltage Instability Load Shedding (VILS) using the existing algorithm, as well as phasor inputs and Wide Area Measurement System (WAMS) concepts, and includes collaboration with other major utilities to assure both the breadth of input and broad applicability of planned results and deliverables. (Con Edison is separately in the process of deploying phasors, which could provide multiple inputs supporting further deployment of this control architecture, if it is shown to provide significant value and benefits.) Specific deliverables will include: technical updates, a technical report and prototype hardware and software. This Phase 1 effort will include algorithm development and comparisons to voltage instabilities indicated by Type Test the high voltage 138 kV Y-Joint as according to North American Standard prior to install this in the field. Additional effort will be added in 2007 to include repair training for Con Edison splicers.

Two focus of this project. To enhance the current control panel of GSSS to provide a more user friendly menu and presetting of system parameters; to design a medium size probe.

92388	EPRI/NYSERDA/DOE TRAVEL BY SYSTEM & TRANSMISSION OPERATIONS PER 345 KV HPFF TMB ENGINEERING ANALYSIS	\$ 310,000	\$ 288,642	\$ 21,358	1991-01-01 Ongoing	\$ 11,279	\$ 15,280	\$ 15,280	\$ 26,316	\$ 5,938	\$ 10,000	\$ 10,000	\$ -	\$ -	-	Facilitate application of new technologies by supporting employee attendance at industry meetings. Simulate cable movement inside the pipe-type environment to determine the effect.
92426	INTERNATIONAL UTILITY WORK GROUP PARTICIPATION	\$ 205,000	\$ 197,543	\$ 7,457	6/14/2002 04/06	\$ 21,134	\$ 9,680	\$ 9,680	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	The International Utility Working Group (IUWG) under the 3G System of the Future Program has a primary goal of benchmarking with dense urban load centers in Europe and the Far East.
92439	IMPROVED ASSET MANAGEMENT TECHNIQUES	\$ 150,000	\$ 24,263	\$ 125,737	8/7/2007 12/09	N/a	N/a	N/a	\$ 10,466	\$ 13,797	\$ 90,000	\$ 90,000	\$ 50,000	\$ -	-	This project builds upon an earlier project which developed an Asset Management Toolkit to create an overall conceptual and functional architecture for asset management across traditional organizational silos. Further development was planned to select portions of this overall roadmap for development as individual software applications that could be interconnected over time to increase their value and effectiveness. Due to personnel changes and reorganizations within EPRI the originally intended project was delayed, and funds have been transferred to other active EPRI projects. Most recently we transferred some of this funding to EPRI project "Optimize Maintenance Through Integrated Monitoring & Diagnostics Circuit Breaker Maintenance Ranking". The ultimate goal of this project is to provide improved maintenance strategies for circuit breakers building upon the strategic and tactical asset management tools specifications for transmission and distribution systems developed under the previous Asset Management Toolkit project. In addition to making use of the best practices for standardized methodologies, business model strategies, data requirements, management and analysis, this effort is intended to integrate these asset management tools in order to maximize synergistic and effective use of related contributing efforts already underway at Con Edison.
92448	TRANSMISSION NETWORK VISUALIZATION SYSTEM - TNVS	\$ 300,000	\$ 301,290	\$ (1,290)	7/30/2002 06/08	\$ 75,000	\$ 73,800	\$ 73,800	\$ 34,990	\$ -	\$ -	\$ -	\$ -	\$ -	-	Implement a visualization system for System Operations bulk power control room using the mimic board as a backbone and integrate with other EMS/Intranet data sources.
92451	345 KV CABLE TMB PERFORMANCE AND TRACKING MANAGEMENT SYSTEM - P	\$ 325,000	\$ 350,132	\$ (25,132)	9/11/2002 04/08	\$ 93,787	\$ 2,338	\$ 2,338	\$ 2	\$ 1	\$ -	\$ -	\$ -	\$ -	-	Vendor had completed the TMB analysis for feeder 25 and 26 per every sub-surface section. This had given additional proof to the "Long Column theory" where as feeder of 1" full wall behavior in a long straight feeder run which is at least 150 feet away from the nearest manhole. We will continue to perform additional analysis for feeder M51, 52, 53, 54, 71, and 72. Project delayed due to unavailable of USI to start work.
92466	TRANSMISSION PROBABILISTIC RISK ASSESSMENT (PRA)	\$ 250,000	\$ 236,547	\$ 13,453	12/10/2002 06/08	\$ 21,064	\$ 24,659	\$ 24,659	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	The project provides funding for a number of elements including: funding for Transmission PRA model development and enhancement work being performed by Dr. Allen of The Risk Research Group, Inc. Continued Improvements in quantitative methods to measure and model Transmission Reliability are required to support operating, maintenance, design and economic decisions in the current more complicated regulatory environment. Although substantial progress has been made in the development and use of metrics and modeling for distribution systems, direct measures of customer interruptions are less meaningful in evaluating the transmission system because of the redundancy of transmission assets and their interactions with generation asset availabilities. Transmission "success" can also be impacted by complex effects beyond just the adequacy of supply versus load including the ability to control power flows with PARs, voltage support and VAR support with the use of generators, transformers, capacitors and shunt reactors at both the system and individual transmission substation levels. Additionally, d
92608		\$ 500,000	\$ 477,052	\$ 22,948	4/9/2003 06/08	\$ 178,592	\$ 134,905	\$ 134,905	\$ 33,008	\$ 1,064	\$ -	\$ 1,064	\$ -	\$ -	-	

TRANSMISSION PRA AND WAMS APPLICATIONS

92622	PARTIAL DISCHARGE MEASUREMENT ON PIPE-TYPE CABLES	\$ 150,000	\$ 35,000	\$ 115,000	10/9/2007 12/09	N/a	N/a	N/a	\$ 20,000	\$ 15,000	\$ 100,000	\$ 100,000	\$ 60,000	\$ -	\$ -	Continued Improvements in quantitative methods to measure and model Transmission Reliability are required to support operating, maintenance, design and economic decisions in the current more complicated regulatory environment. This is particularly true with NERC's new role as the Electric Reliability Organization (ERO), the advent of NERC Reliability Standards and increasing discussions regarding the development of transmission reliability metrics. It is anticipated that the existing Con Edison Transmission PRA model will require additional enhancements and developments to interface more easily with the new EMS System, deal with new reliability standards and requirements and in the longer term to make more effective use of new applications being developed to make more effective use of phasor deployments and future wide area control enhancements. Although substantial progress has been made in the development and use of metrics and modeling for distribution systems, direct measures of customer interruptions are less meaningful in evaluating the transmission system because of the redundancy of transmission assets and their interactions with generation asset availabilities. Transmission "success" can also be impacted by complex effects beyond just the adequacy of supply versus load including the ability to control power flows with PARs, voltage support and VAR support with the use of generators, transformers, capacitors and shunt reactors at both the system and individual transmission substation levels. Additionally, data required to support transmission reliability modeling at the component level is much less commodity driven, and requires extensive interpretation to reflect complexity of devices, equipment maintenance, repair and/or replacement, vendor and vintage differences. The objective of the project is to assess and demonstrate the feasibility of using partial discharge (PD) measurements on pipe-type cables. The objective of this project is to design and develop a reliable leak detection system for Feeders 25 and 26. First part is to upgrade the CPU capability and mathematical model to increase CPU running efficiency and add flow meters at Goethals. Second is to install a low cost portable and mobile 2 Ghz digital wireless system between Goethals and Norton Gannon to try to overcome heavy communications interference. This new system will run simultaneously with the existing land-line system and provide an alternate communications path. If successful, this project will allow us to have a better assessment of the leak detection data, provide remote access and troubleshooting, deploying the data for multi-functional purpose and benchmark for cooling plant communication.
92640	FEEDER 25 AND 26 LEAK DETECTION SYSTEM ENHANCEMENT	\$ 320,000	\$ 317,100	\$ 2,900	12/19/1999 10/05	\$ (3,262)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
92642	REAL-TIME RELAY PROTECTION AUTOMATED FAULT ANALYSIS SYSTEM	\$ 150,000	\$ 161,921	\$ (11,921)	6/30/2003 04/05	\$ 10,671	\$ 2	\$ 2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Current Fault analysis for transmission and distribution systems automatic operations are performed manually by protection engineers. While this detailed analysis is still required to maintain reliability, it does not address Systems Operations's need for a summary analysis within minutes following occurrence of the disturbance. We had demonstrated in Phase 2 of this project the high accuracy of the fault locating algorithm, and that it is feasible to setup a production mode real-time monitoring system for selected feeders which are equipped with Digital Fault Recorder (DFR). The next step will be to implement an automated system to trigger the fault locating and present fault location results to system operation within 5 minutes.
92660	WIDE AREA REAL-TIME FREQUENCY VISUALIZATION	\$ 270,000	\$ 149,997	\$ 120,003	10/17/2007 11/09	N/a	N/a	N/a	\$ 269,994	\$ (119,997)	\$ -	\$ 150,000	\$ -	\$ -	\$ -	One of the recommendations to prevent cascading outages of power system is to improve operator's situational awareness. Although any PMUs have been installed in the Eastern Interconnection, the potential benefits of real time PMU measurements have not been fully utilized due to the lack of visualization and control applications using PMUs. Operators need to know what is happening at their neighboring systems in order to improve their situational awareness. When a major event occurs in an interconnected power system, such as multiple generator outages, it will be very important and beneficial for the power system operators or regional reliability coordinators to know the estimated location, the magnitude and the type of the event in real-time such that they will be able to work together to take appropriate and coordinated control actions to handle the outages. In current EMS, although there are various types of EMS applications and displays, advanced visualization applications are not yet available to fully utilize the available EMS data to provide GIS based visualization application for improving operators' wide area situational awareness and to take the appropriate preventive or corrective control actions. More R&D effort is required in these areas.
92669		\$ 95,000	\$ 61,560	\$ 33,440	10/25/2007 09/08	N/a	N/a	N/a	\$ 60,000	\$ 1,560	\$ 35,000	\$ 35,000	\$ -	\$ -	\$ -	



IMPROVED LBMP MARKET SIMULATION MODEL

Capturing outages are particularly important when forecasting New York City Day Ahead Market (DAM) Locational Based Marginal Pricing (LBMP), given the high load and transmission constraints. It is difficult to efficiently adjust for all plant and transmission outages using the Bid Stack Model currently employed by Energy Management. Further, the model does not emulate the New York ISO's

LBMP algorithm in a timely manner. This makes pricing forecasts less accurate. In addition, the existing system only partially supports the complex decision process that involves information retrieval, alternative comparisons and strategy development. "What If" analysis capabilities would greatly facilitate confidence in decision making impacted by multiple factors. However with the current Bid Stack Model, this is not viable due to the manual-intensive iteration, and the limited time available to factor in the effects of various relevant factors on market behavior. To develop an on-line, automated oil processing system, which would eliminate the need for equipment outages and around-the-clock personnel monitoring. This automated unit would be equipped with the necessary components to restore the transformer oil to "like-new" conditions. The increased concern for external threats to Con Edison's infrastructures in the wake of 9/11 dictates that, we explore the expanded use of tools that could provide more cost effective improvements in monitoring and responding to potential threats to the physical security of the electric, gas and steam infrastructures. Video surveillance and intrusion detection technologies, which currently exist have limitations in cost, effectiveness under various conditions, discrimination of false indications, requirements for communication infrastructure and bandwidth and their ability to provide effective monitoring of distributed infrastructure such as transmission line Rights of Way that inhibit their effective use and wider deployment throughout all Con Edison's facilities.

This project will install a full on-line monitoring system, and develop enhancements that can be incorporated into a future commercialized version that can be used at other Con Edison Substations. This technology is not currently available with the features, low cost and flexibility provided by the proposed system. The system will be able to detect developing problems and support avoidance of in-service failures, which can be catastrophic and cause substantial damage.

Evaluate and demonstrate new technologies such as PEM fuel cell based backup power supply for station battery that could enhance the operation and performance of our station batteries during extended outages.

Develop technologies which extend the life of substation equipment.

Investigate the technical and economic feasibility of converting or replacing all or parts of existing LTC control schemes with solid state circuitry and position sensors. Develop a conceptual approach and design.

The average age of Con Edison's LTC equipped power transformers exceeds

25 years and, as this equipment has aged, the need for maintenance of the controls has increased. Over the last two years, LTC "hang up's" due to control problems have averaged 18 per year and account for 25% of all Out on Emergency forced outages for transmission substation equipment.

This project will investigate the technical and economic feasibility of converting or replacing all or parts of existing LTC control schemes with solid-state circuitry and position sensors. A conceptual approach and design will be developed.

92787	AUTOMATED TRANSFORMER OIL ON-LINE RE-PROCESSING UNIT	\$ 150,000	\$ 112,588	\$ 37,412	1/2/2007 12/08	N/a	N/a	N/a	\$ 113,319	\$ (731)	\$ 50,000	\$ 50,000	\$ -	\$ -	-
92058	VIDEO SCADA TEST BED FOR INFRASTRUCTURE SECURITY	\$ 50,000	\$ 47,173	\$ 2,827	10/18/2004 08/06	N/a	\$ (3,159)	\$ (3,159)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92137	IMPLEMENTATION OF ON-LINE ULTRASONIC PARTIAL DISCHARGE LOCATION SYSTEM FOR 49TH STREET SUBSTATION	\$ 475,000	\$ 275,709	\$ 199,291	3/25/2005 12/09	N/a	\$ -	\$ -	\$ 47,793	\$ -	\$ 75,000	\$ -	\$ -	\$ -	-
92160	ADVANCED BACKUP POWER FOR SUBSTATION AUXILIARIES	\$ 250,000	\$ 187,134	\$ 62,867	3/18/2001 12/06	N/a	\$ 5,500	\$ 5,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92168	CEA LIFE CYCLE MANAGEMENT SUBSTATION EQUIPMENT	\$ 145,000	\$ 75,621	\$ 69,379	4/26/2005 12/08	N/a	\$ 72,349	\$ 72,349	\$ (9,192)	\$ -	\$ -	\$ -	\$ -	\$ -	-
92176	AND APPARATUS IN TRANSFORMER LOAD TAP CHANGER CONTROLS RETROFIT	\$ 150,000	\$ 126,656	\$ 23,344	4/10/2001 06/08	N/a	\$ 39,655	\$ 39,655	\$ (31,353)	\$ 11,238	\$ 25,000	\$ 11,238	\$ -	\$ -	-
92240		\$ 100,000	\$ 38,076	\$ 61,924	7/11/2001 06/08	N/a	\$ -	\$ -	\$ 2,831	\$ -	\$ -	\$ -	\$ -	\$ -	-

DEMONSTRATION OF GROUND PENETRATING IMAGING RADAR FOR FEEDER PLACEMENT																	
92324	PORTABLE SUBSTATION FEEDER DIELECTRIC PRESSURE CALIBRATOR	\$ 190,000	\$ 184,603	\$ 5,397	6/11/2007 12/08	N/a	N/a	N/a	\$ 184,571	\$ 32	\$ -	\$ 32	\$ -	\$ -	-	Construction of new underground transmission facilities can be complicated by the lack of detailed maps giving accurate locations and the nearby presence of water, sewer, communications structures and abandoned infrastructure such as trolley tracks. Currently, test pits are dug at the planning stage to confirm the location of potential conflicts to provided detailed information for integration into final design or field modifications. However, in some locations test pits are not always feasible due to obstructions, traffic patterns and local municipality restrictions. If accurate maps of the underground area of interest were available, project cycle times would be reduced and safety when digging near critical facilities improved. In the long run, the need for test pits may be significantly reduced. A new generation of ground-penetrating imaging radar and associated data processing algorithms have been successfully demonstrated to map underground structures on a large scale. The GPIR system makes use of a multi channel Develop and design a user-friendly portable tool that allows a mechanic to tap into the manifold in a pump house or PURS and be able to manually calibrate the multiple pressure switches and gauges to known standards.	
92455	INDUSTRY FAILURE DATABASE	\$ 50,000	\$ 30,728	\$ 19,272	8/8/2002 04/08	N/a	\$ -	\$ -	\$ 2,828	\$ -	\$ -	\$ -	\$ -	\$ -	-	Equipment and system reliability is becoming increasingly important in utility operations and planning. Industry wide data increases the population of specific equipment models to statistically significant levels that can provide more meaningful and representative data. In addition to gain the maximum benefit from this data, significant failure contributors such as duty cycle, environment, through fault history, significant maintenance or repairs, test results and post failure tear down root cause identifications are needed. Phase 1 work will include a detailed evaluation of a typical Transformer vault at East 36th Street. and a survey of other typical locations to identify and ultimately evaluate a list of ventilation optimization alternatives that could be applied to these existing locations and/or incorporated into new transformer vault installations. The pilot work at East 36th Street was chosen to obtain a maximum synergy with the ongoing Trnasformer Misting DEMO project that is in progress at this site.	
92460	TRANSFORMER VAULT VENTILATION OPTIMIZATION	\$ 250,000	\$ 250,000	\$ -	11/1/2002 12/05	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	Develop a visualization tool to allow the Dunwoodie 345 South and North Control Room and the 138 kV control room to have access to real-time Bulk Power Transmission network information.	
92469	WESTCHESTER SOUTH SUBSTATION VISUALIZATION SYSTEM	\$ 50,000	\$ 37,500	\$ 12,500	12/17/2002 12/05	\$ -	\$ 12,500	\$ 12,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	The project objective is to perform studies and field tests of the ISOPOR oil purification system to assess the effectiveness of oil purification and compare the impacts on tap changer contact life with no oil purification, with Balanced Charge Agglomeration Filtering (BCAF) and with Evacuation Filtering used in addition to BCAF, and to further condition the oil with Oil Reclamation to enhance oil and LTC life, create optimized conditions for partial discharge monitoring and compare results obtained combining two different PD monitoring sensing methodologies.	
92494	LOAD TAP CHANGER OIL CONDITIONING & PD MONITORING	\$ 50,000	\$ 31,008	\$ 18,992	9/24/2007 12/09	N/a	N/a	N/a	\$ 31,008	\$ -	\$ -	\$ -	\$ -	\$ -	-	This RADPAR will fund specific projects suggested by EPRI, equipment vendors or others to test, validate or evaluate monitoring equipment and sensors that are being considered for broader deployment as part of an overall asset management strategy, as well as to assess condition based monitoring data as input to maintenance and replacement plans and programmatic asset management strategies.	
92651	CONDITION BASED MONITORING FOR CKT BKRS, XFMRs & OTHER SUBSTATION EQUIPMENT	\$ 250,000	\$ 232,461	\$ 17,539	7/10/2003 12/06	\$ 35,224	\$ 55,012	\$ 55,012	\$ -	\$ 303	\$ -	\$ -	\$ -	\$ -	-	The objective of the project is to perform a preliminary study to determine the withstand level of our transmission lines relative to ice build up, identify improvements needed, and ways to mitigate ice build up.	
92730	<b>SUBTOTAL TRANSMISSION PROGRAM</b>	\$ 250,000	\$ 80,000	\$ 170,000	11/20/2007 12/10	N/a	N/a	N/a	\$ 80,000	\$ -	\$ 100,000	\$ 100,000	\$ 100,000	\$ -	-	Test the wear and durability of composite covers when installed in traffic and sidewalk areas. Verify that worn covers maintain loading requirements while in service as per NYCDOT and AASHTO. Analyze the useful life expectancy of composite covers.	
	<b>DISTRIBUTION PROGRAM</b>	<b>\$14,086,000</b>	<b>\$ 9,734,465</b>	<b>\$ 4,351,535</b>					<b>\$ 1,219,612</b>	<b>\$ 2,113,533</b>	<b>\$ 2,113,533</b>	<b>\$ 1,326,350</b>	<b>\$ 79,282</b>	<b>\$ 1,995,000</b>	<b>\$ 1,825,134</b>	<b>\$ 700,000</b>	<b>\$ 400,000</b>
92279	WEAR TESTING FOR COMPOSITE TRENCH PANELS	\$ 150,000	\$ 135,906	\$ 14,094	4/23/2007 12/08	N/a	N/a	N/a	\$ 135,906	\$ -	\$ -	\$ -	\$ -	\$ -	-	In this effort, we will opulate the CIS (Customer Information System) and load research data with NAICS codes. An NAICS code is a unique identifier to a specific industry and will facilitate in segregating our customers into homogenous groups with similar load patterns.	
92355	DEVELOPMENT OF ENGINEERING MODELS BY ASSOCIATING CUSTOMERS AND LOAD RESEARCH DATA TO NAIC CODES	\$ 50,000	\$ 6,000	\$ 44,000	6/20/2007 12/08	N/a	N/a	N/a	\$ 6,000	\$ -	\$ -	\$ -	\$ -	\$ -	-		
92000		\$ 50,000	\$ 43,350	\$ 6,650	2/6/2007 07/08	N/a	N/a	N/a	\$ 40,500	\$ 2,850	\$ -	\$ 2,850	\$ -	\$ -	-		

Project ID	Project Description	Budget	Actual	Remaining	Start Date	End Date	Phase	Status	Cost	Revenue	Net	Other	Net	Other	Net	Other	Notes
	VALIDATION OF ENGINEERING MODELS IN MANHATTAN WITH FIELD MEASUREMENTS - PHASE 0																In this effort, we will evaluate and select the locations for measurements required to validate the engineering models. We will select two locations where the suggested field measurements will be installed in order to determine the feasibility to expand this effort with sufficient data points to validate the engineering model.
92001	MODEL BUILD FEASIBILITY USING DEW	\$ 50,000	\$ 8,438	\$ 41,563	2/5/2007	06/08	N/a	N/a	N/a	\$ 8,438	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	In this effort, EDD will conduct a review of the model data available for the various other boroughs and determine whether there are sufficient similarities.
92002	DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE AND MANHOLE EVENTS ANALYSIS - PHASE I	\$ 50,000	\$ 31,750	\$ 18,250	2/5/2007	12/08	N/a	N/a	N/a	\$ 31,750	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Con Edison Underground Distribution system consists of approximately 300,000 structures. In 2005, we recorded approximately 230 shock incidents and more than 2,300 manhole events consisting of explosions, fires and smokers. To better design mitigation techniques, we need to identify those factors that are significantly correlated to these events. The ability to identify those structures that are most vulnerable to such events will also help us prioritize and target our spending more effectively. In 2005, Columbia University conducted aPhase 0 study and performed exploratory work on secondary network failure data and the related trouble ticket data. Prototype software was created to extract information from ECS tickets and integrate into a geographic database. Effects of winter weather on secondary network events were analyzed and modeled.
92007	PARTIAL DISCHARGE SNIFFER DEVELOPMENT	\$ 390,000	\$ 339,250	\$ 50,750	3/1/2007	06/08	N/a	N/a	N/a	\$ 339,250	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	The feeder cables and splices in our underground network system are of various ages and are subject to a wide array of environmental conditions. There exists no system for determining their remaining useful life. Physical inspection of the visible external attributes of cables and splices is used to determine safe entry protocols, and to manage maintenance and replacement programs. This project will explore the practicality of a hand-held partial discharge detector that will act as a pre-entry sniffer to enhance safety and improve maintenance effectiveness. Cablewise will engineer and develop a bench-top partial discharge sensor and make initial observations of exemplar components and equipment in typical field manholes.
92017	RELIABILITY ANALYSIS METRICS FOR 3G SYSTEM OF THE FUTURE (SOF) DESIGN	\$ 50,000	\$ 49,218	\$ 782	7/16/2004	12/08	\$ -	\$ 2,718	\$ 2,718	\$ 15,000	\$ -	\$ 30,000	\$ 34,500	\$ -	\$ -	\$ -	In this effort, we will conduct a review of the merits of probabilistic reliability approaches suggested to date for use in design concepts evaluation. If required, alternative approaches or metrics will be developed as part of this project.
92021	REAL-TIME BATTLEFIELD VISIBILITY COCKPIT CONTROL CENTER DECISION SUPPORT - PHASE 1	\$ 50,000	\$ 17,008	\$ 32,992	3/1/2007	09/08	N/a	N/a	N/a	\$ 19,378	\$ (2,370)	\$ -	\$ 20,000	\$ -	\$ -	\$ -	In any severe and rapidly developing emergency, defining the problem through multiple detection of anomalies, and the subsequent actions taken to mitigate the situation, requires comprehension using both knowledge from within the operator and analysis of many facets of the electric system design basis and the system's present status. In order for an operator to analyze the situation adequately and be able to act upon it, it is imperative that information be presented in concise operator oriented displays that present the most important information in priority order. This would be analogous to a Heads Up Display (HUD) utilized in battlefield conditions It presents a highly visible view of what the operator needs to know immediately in order to respond to emerging threats.
92052	4KV GRID POWER FLOW OPTIMIZATION USING ADVANCED	\$ 145,000	\$ 58,368	\$ 86,632	3/23/2007	09/08	N/a	N/a	N/a	\$ 41,512	\$ 16,856	\$ -	\$ 46,000	\$ -	\$ -	\$ -	Development of methods for power flow optimization in the 4 Kv network grid by using new voltage regulation techniques.
92059	CONTOLLERS DEVELOPMENT OF A PORTABLE PHANTOM LOAD DEVICE FOR TESTING REVENUE METERS ON SITE	\$ 120,000	\$ 9,877	\$ 110,123	11/9/2004	12/05	\$ 9,877	\$ -	\$ -	\$ -	\$ -	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	Available test sets are not suitable for Con Edison field force use and do not meet our specifications. A new device will repalce the existitng meter test set, which does not currently have the capability to collect and record the test data.
92092	DATA VISUALIZATION FOR ENHANCED DECISION MAKING	\$ 35,000	\$ 32,500	\$ 2,500	1/3/2005	10/05	\$ -	\$ 32,500	\$ 32,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Existing tools such as excel spreadsheets are limited in its capabilities to analyze data and information from disparate sources. Key insights are often missed when data presentation is limited. A better data visualization tool is needed by engineers and operators to view and identify patterns, trends and anomalies in a single analysis environment. This capability allows the user to incorporate various data sources in order to conduct a broader analysis.
92112	CONTINENTAL AUTOMATED BUILDINGS ASSOCIATION MEMBERSHIP	\$ 145,000	\$ 68,212	\$ 76,788	3/30/2007	03/08	N/a	N/a	N/a	\$ 68,212	\$ -	\$ 15,000	\$ 15,000	\$ -	\$ -	\$ -	The objective is to join Continental Automated Buildings Association (CABA) and Internet Home Alliance Research Council (IHA-RC). This is a non-profit industry association that promotes and encourages development of advanced technologies for the automation of homes and buildings in North America.
92115		\$ 25,000	\$ 6,000	\$ 19,000	2/20/2008	02/11	N/a	N/a	N/a	N/a	\$ 6,000	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ -	

APPLICATIONS RESEARCH FOR DISTRIBUTION, SUBSTATIONS AND TRANSMI														We face a continuing need to provide improved delivery of energy at lower cost. This project will provide an additional venue for collaboration on research, development, prototyping and testing the widening range of technologies and equipment that are becoming possible and/or are being developed by vendors.		
92119	DEW CIRCUIT BUILDER FOR MANHATTAN	\$ 370,000	\$ 267,370	\$ 102,631	2/25/2005 03/09	N/a	\$ 86,719	\$ 86,719	\$ 105,000	\$ (12,500)	\$ -	\$ 40,000	\$ -	\$ -	-	Con Edison is building electric system analysis models with the capability of analyzing network systems at the secondary level. Thus far, one model, Sutton Netowk, has been built in DEW (Distribution Engineering Workstation) as a proof of concept. The model was based on data extracts. In order to move the model building into production, a circuit builder is needed to easily
92120	DISTRIBUTION CABLE AND SPLICE CENTER FOR EXCELLENCE AT VAN NEST	\$ 465,000	\$ 8,063	\$ 456,938	2/21/2008 12/08	N/a	N/a	N/a	N/a	\$ -	\$ 300,000	\$ 360,000	\$ -	\$ -	-	build and maintain models in DEW. Establish a Distribution Cable & Joint Center of Excellence at Van Nest to evaluate distribution assets and develop improved solutions for necessary repair and replacements. Consolidate the cable and joint autopsy programs that were dispersed among various operating groups. Develop databases and analyze condition assessment techniques and data-mine the databases to optimize the future management of distribution cable system operations, maintenance and replacement. Enhance inter-utility collaboration cable distribution and splices.
92122	MAJOR SERVICE MANAGEMENT AND SUPPORT SYSTEM	\$ 2,400,000	\$ 1,688,027	\$ 711,973	12/14/2000 12/09	\$ (31,802)	\$ 92,165	\$ 92,165	\$ (31,309)	\$ 100,000	\$ 225,000	\$ 100,000	\$ 250,000	\$ 250,000	\$ -	Demonstrate the field use of a newly developed portable moisture analyzer for monitoring transformer oil.
92125	MEAN-TIME-BETWEEN-FAILURES STATISTICAL ESTIMATION FOR FEEDERS, SECTIONS AND JOINTS	\$ 225,000	\$ -	\$ 225,000	2/27/2008 01/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 150,000	\$ 35,000	\$ -	\$ -	To develop a technique, equipment, process or other means that would repair/recondition a secondary, cable/joint system in a manhole and
92126	SUBSTATION RELIABILITY	\$ 472,000	\$ -	\$ 472,000	2/28/2008 12/08	N/a	N/a	N/a	N/a	\$ -	\$ 225,000	\$ 472,000	\$ -	\$ -	\$ -	restore insulation or mechanical integrity. Design and develop a six foot regulated heat cover to straighten out solid dielectric cable fro splicing. The current practice can lead to overheating and field crew has to replace damaged cable and additional time to treat the cable. Overhead problem had occurred four times during 2000.
92129	DEMONSTRATION OF MOBILE/TRANSPORTABLE VIDEO SYSTEMS FOR SECURITY APPLICATIONS	\$ 135,000	\$ -	\$ 135,000	3/1/2008 03/09	N/a	N/a	N/a	N/a	\$ -	\$ 75,000	\$ 75,000	\$ 60,000	\$ -	\$ -	When special events happen in the field and the situation may potentially impact the safety and well-being of the public, our capital assets, or other high-value infrastructure, we need to assess the situation quickly and provide critical information to the right security personnel regardless of their location on the ground. Typically, Security Services has fixed cameras, but they aren't located where you need them during these special events and situations. Dispatching personnel to the scene to provide an assessment of the situation can be expensive, time-consuming or impractical. What is needed is a low cost, tranportable video solution that is easily installed and provides the ability to instantly broadcast live video and other data from the scene that can be shared immediately with everyone who needs to see
92139	GREEN CIRCUIT INITIATIVE - EPRI	\$ 75,000	\$ -	\$ 75,000	3/17/2008 03/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 65,000	\$ -	\$ -	\$ -	it, wherever they may be located. This project is a collaborative effort among several utilities that will result in a field demononstration in each utility on a handful of circuits converted to Green
92140	CERA NORTH AMERICAN ELECTRIC POWER ADVISORY SERVICES	\$ 140,000	\$ -	\$ 140,000	3/18/2008 03/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 70,000	\$ -	\$ -	\$ -	Circuits with a goal of significantly reducing losses. To be competitive and responsive to our customers, we need a source of independent analysis, strategic insights and in-depth assessment related to energy markets, services and technologies, partrcularly rn the areas of distribution system management, distributed generation, storage technologres, and other emerging technologies This appropriation provides funding for muli year access to the Cambridge Energy Research Association (CERA) North American Electric Power Advisory Services. This advisory services includes emerging generation related technologies (fuel cell, microturbine, advanced batteries, etc) that can be used by Corporate Planning and R&D as a basis for development and demonstration to improve our overall system and operation.
92141		\$ 84,000	\$ 25,741	\$ 58,259	4/5/2007 03/10	N/a	N/a	N/a	\$ 25,741	\$ -	\$ 29,000	\$ 25,000	\$ 29,000	\$ -	\$ -	

STREET BARRICADE BRACKET DESIGN & DEVELOPMENT

During a typical year, our field crews enter about 45,000 electric manholes and boxes. The crews incur daily problems gaining access to many of these structures, and incur significant delay or standby time waiting for vehicles to be moved. Frequently, the work location can be scheduled or continues from a prior day. For these, field crews commonly use street barricades to preserve access for work. But parking spots are highly valued and resourceful New York drivers move such barricades with abandon. This project will develop and design the bracket, and allow fabrication and trial of several prototypes. This bracket should also aid the physical protection of secondary mains shunts.

92151	FEEDER TRACING CURRENT REMOTE SENSING DEVELOPMENT AND DEMONSTRATION	\$ 20,000	\$ 10,000	\$ 10,000	4/8/2005 12/06	N/a	\$ 20,000	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
92159	DEMONSTRATION OF AN ADVANCED PROTECTION SCHEME FOR A SECONDARY NETWORK SYSTEM: PHASE II	\$ 225,000	\$ 161,825	\$ 63,175	4/20/2005 12/08	N/a	\$ 82,733	\$ 82,733	\$ 59,225	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
92164	CEA POWER QUALITY PROJECTS	\$ 50,000	\$ 48,000	\$ 2,000	4/11/2008 10/09	N/a	N/a	N/a	N/a	\$ 48,000	\$ -	\$ 50,000	\$ -	\$ -	\$ -
92173	ENERGY STORAGE FOR PEAK LOAD SERVICE	\$ 150,000	\$ 148,767	\$ 1,233	3/22/2001 12/06	N/a	\$ 40,313	\$ 64,866	\$ 64,866	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
92184	FAULT INDICATORS WITH AUTOMATIC RESET FOR NETWORK APPLICATION	\$ 50,000	\$ 50,000	\$ -	5/26/2005 05/07	N/a	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ 55,000	\$ -	\$ 100,000	\$ 100,000	\$ -
92185	PHASE I - FEASIBILITY STUDY TO DEVELOP COMPOSITE TRANSFORMER GRATINGS	\$ 50,000	\$ 49,974	\$ 26	5/23/2005 01/06	N/a	\$ 24,000	\$ 24,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
92190	DEW COMMON DESIGN FOR ISM INTERFACE	\$ 100,000	\$ -	\$ 100,000	5/9/2008 01/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 80,000	\$ 20,000	\$ -	\$ -
92192	INTEGRATION OF PRECISE WEATHER FORECASTING IN EMERGENCY RESPONSE MANAGEMENT	\$ 395,000	\$ -	\$ 395,000	4/4/2008 12/09	N/a	N/a	N/a	N/a	\$ -	\$ 100,000	\$ 350,000	\$ 225,000	\$ -	\$ -
92194		\$ 416,000	\$ -	\$ 416,000	5/14/2008 02/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 375,000	\$ 41,000	\$ -	\$ -

Feeder cables and splices in our underground network system are of various ages and are subject to a wide array of environmental conditions. Occasionally, the condition of a component in a manhole requires that it be classified as a D fault, and access to the structure is restricted. In order to make repairs the involved feeder is taken out of service. However, positive identification of the involved feeder is required, and until that identification is made there exists the possibility that the component is not on the expected feeder, but is on another one and is therefore still energized. This project will design and build several wireless remote tracing current pick-up coils and associated receivers and explore the feasibility of their use on our system.

The overall objective is for Kinectrics to demonstrate that advanced protection schemes can be integrated into existing secondary networks. The primary objective is to assemble a system as designed in phase I, test it, install it in one of the participating utilities secondary networks and monitor its operation for one year. A second objective is to develop a reliable method of initiating an arcing fault on an unloaded cable for use in a field trial.

Identify and pursue projects which improve power quality. Con Edison considered an even larger version of this demonstration on the Con Edison system. Participation in the EPRI-NYPA will provide a significant portion of the benefits at a lower cost, as well as alert us to the load implications of a new technology that could be adopted by transit and other entities within our service area.

Test and evaluate underground Fault Circuit Indicators (FCI) for Con Edison network applications. Distribution Engineering (DE) will begin a feasibility study with a composite cover manufacturing company to determine what are the Operating requirements needed to consider a re-design of Con Edison's transformer ratings using composite materials. The new composite grating will be designed to meet venting, loading and American Disabilities Act requirements. To come up with the proposed design, the vendor will make field visits a number of transformer vaults with gratings and hold project meetings with DE. The vendor will then compile proposed design or concept drawings to present to DE for further review and approval for a subsequent Phase 11, which will proceed with the construction of prototype gratings for testing.

Con Edison is developing an Integrated System Model for the electric system incorporating GIs system data, SCADA data, reliability data and interfaces to visualization systems. The goal is to place these models on a common platform where the users can build, maintain and visualize the models in views that are familiar. A common design document is needed to lay the foundational design decisions, documentation, and processes that will affect specific circuit building activities such as in Staten Island, Manhattan and Westchester.

Facilitate company year 2000 compliances by participating in EPRI's year 2000 embedded systems project.

NETWORK TRANSFORMER FAILURE ANALYSIS AND ROOT CAUSE DETERMINATION - PHASE II																		
92195	DISTRIBUTION FAULT ANTICIPATOR	\$ 499,700	\$ -	\$ 499,700	5/28/2008 12/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 200,000	\$ 299,700	\$ -	\$ -	-	-	In an in-service population of 25,000 network transformers, there are approximately 125 failures/year, of which about 20 are ruptures, and of these about 10 are violent events. Although this is a relatively small number, it is a threat to public safety. Additional research is required to determine the root cause of the failures. Incipient faults ( e.g., tree limb contacting overhead primary, damaged or contaminated pole-top insulators, arrestors, etc. ) on overhead feeders are difficult to detect. We seek a device to monitor feeders and alarm for events that are too small to cause a voltage dip noticeable by customers, trip a breaker, or blow a fuse. Such events are the precursors to permanent faults and customer interruptions.
92230	REMOTE FEEDER ID - ARTICULATING ARM DEVELOPMENT	\$ 287,000	\$ 217,516	\$ 69,484	6/27/2001 12/08	\$ 1,123	\$ 4,305	\$ 4,305	\$ 26,261	\$ 3,614	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	\$ -	-	-	This project will design, fabricate and test a tripod-mounted articulating arm to allow placing of a galvanometer on a cable or splice in a manhole; allowing feeder identification without requiring an operator to enter the structure.
92271	CUSTOMER LOAD DEMAND MODELS DEVELOPMENT	\$ 25,000	\$ 19,750	\$ 5,250	4/12/2007 12/08	N/a	N/a	N/a	\$ 19,500	\$ 250	\$ -	\$ 20,000	\$ -	\$ -	\$ -	\$ -	-	Under another project CSN 92711 (Integrated System Model (ISM) validation using DEW for 3G System of the Future Design), an integrated system model including the transmission, substation and distribution down to the customer is being developed for the Sutton Network. EDD (Electrical Distribution Design, Inc.), DEW developer, is currently working with Engineering to compare and evaluate both power flow and reliability analysis against existing tools and measured data. As a result of their effort, it has been concluded that new homogenous load groups for 10,000 customers needs to be developed in order to obtain an accurate power flow model. In this project, EDD will develop new categories of homogenous customer groups to represent homogenous load patterns. Statistical method will be used to analyze large amounts of historical load demand and consumption data collected at select locations. The results are then applied to raw customer billing data to estimate the customer demands at each customer location. The information will then be applied to the DEM model and improved accuracy is expected.
92281	MITIGATION TECHNIQUES TO REDUCE INRUSH CURRENTS OF NETWORK TRANSFORMERS	\$ 475,000	\$ 398,901	\$ 76,099	4/23/2007 09/08	N/a	N/a	N/a	\$ 349,365	\$ 49,536	\$ 53,000	\$ 97,896	\$ -	\$ -	\$ -	\$ -	-	A recent review on the number of CIOA (Cut-in Open Autos) on the Con Edison system from January 2007 to March 2007 showed that of the 37 CIOAs, 18 percent were attributed to inrush currents Open autos due to inrush current, if not probably identified and mitigated will result in time and money wasted in feeder processing. At present, the cause of the CIOAs are unknown. The problem needs to be studied in more detail in order to develop techniques for mitigation.
92297	ENHANCED 4 KV GRID SUBSTATION MONITORING - PHASE I	\$ 225,000	\$ 29,670	\$ 195,330	5/1/2007 08/08	N/a	N/a	N/a	\$ 20,293	\$ 9,377	\$ 125,000	\$ 125,000	\$ -	\$ -	\$ -	\$ -	-	Recent events on the 4 kV distribution system surfaced a number of inadequacies with our existing monitoring at 4 kV unit substations. One such event involved failure of a unit substation main breaker to operate causing outage to thousands of customers. The cause of the failure was attributed to defective backup battenes at the substation. The existing design of the battery monitoring system was not capable of alarming the deteriorated conditions of the batteries. On a separate event, a number of spurious breaker inputs were attributed to harmonics on the feeder. Harmonic distortion could alsomask real substation load which if not detected, would be relieved unnecessarily and at considerable expense. There is currently no monitoring at the unit substations that could alert engineers of such a condition. Adequate monitoring of equipment can also provide the justification to change
92300		\$ 250,000	\$ -	\$ 250,000	5/3/2007 12/07	N/a	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	maintenance cycle from time based to operational based.

DEMONSTRATION OF DEEP THUNDER WEATHER  
FORECASTING FOR EMERGENCY MANAGEMENT  
OPERATIONS

Con Edison currently collects, analyzes and disseminates various sources of weather information and forecast for use by Emergency Response Management personnel. IBM'S Deep Thunder weather model provides high-resolution local weather forecasts and has the potential to become the premier forecasting model for Con Edison in Westchester, New York City and O&R areas. Its 1x1 km grid is already the finest resolution available today. Deep thunder also has the capability through extensive visualization tools to transform and present derivative weather data specifically for managing and planning storm restoration efforts. For example the weather data could be presented as number of downed poles, transformers and conductors in a square km. As such, Deep Thunder offers the potential to realize significant improvement in Con Edison's emergency management activities.

92302	MACHINE LEARNING TOOL DEVELOPMENT FOR FEEDER CABLE AND SPLICE R	\$ 150,000	\$ 152,100	\$ (2,100)	5/7/2007 12/08	N/a	N/a	N/a	\$ 124,100	\$ 28,000	\$ -	\$ 28,000	\$ -	\$ -	\$ -	Con Edison's 1261 distribution feeders consist of 140,500 cable sections including 43,500 PILC cable sections, along with associated splices and terminations. We seek a predictive tool to better plan feeder cable and splice replacement. On predecessor project 92674, the Columbia Center for Machine Learning developed machine learning algorithms to analyze multiple attributes and predict survivability of PILC cable sections. The results are promising but are not yet at the level that is achievable with these tools or precise enough to be used for cable and splice replacement planning. This follow-on project will develop and gather additional attributes to give prediction accuracy at or near theoretical limits. In addition this project will expand the scope of the original work to include all other types of distribution feeder cables, and their splices and terminations.
92314	DSM PROGRAM FOR RESIDENTIAL COOLING APPLIANCES USING POWER LINE	\$ 950,000	\$ 823,468	\$ 126,532	12/12/2005 06/07	N/a	\$ 947,701	\$ 947,701	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Build, demonstrate and evaluate the technical feasibility and economic benefits of a utility managed load curtailment program for 200 window mounted air conditioners at Princeton House.
92323	TROPICAL WOOD POLES - DEMONSTRATION AND TRIAL USE	\$ 138,000	\$ 95,000	\$ 43,000	12/14/2005 03/07	N/a	\$ 95,000	\$ 95,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	This project is a follow-on project to CSN 92765 which procured the poles in collaboration with other utilities via EPRI. This follow-on funding will cover inspection, storage and handling on the poles not provided for in the original appropriation, as well as other incremental costs for care and monitoring of this initial demonstration population.
92325	RODENT SHIELD DEVELOPMENT & DEMONSTRATION	\$ 40,000	\$ 14,251	\$ 25,749	6/15/2007 12/08	N/a	N/a	N/a	\$ 14,251	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Develop and field-test a rodent shield device as an alternative to poisons or traps. These units will be placed in the ducts and the sub surface structures will be regularly monitored for rodents.
92342	SECONDARY MONITORING SUTTON NETWORK PILOT	\$ 20,000	\$ 18,967	\$ 1,034	1/23/2006 07/06	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Monitoring the secondary network is a non-trivial task that has challenged the industry for more than 50 years. Physical and financial constraints coupled with technology shortfalls made it next to impossible. However, with today's sensor technology, microprocessors, and communications options, secondary monitoring may be possible. Our previous experiments indicate that an AMI ready smart meter can be adapted to monitor secondary cables in the underground manholes. We plan to install these meters (micro RTU) in 50 locations (a total of 100 micro RTUs will be installed) in Sutton network to test the performance of the technology and to validate load flow models. Additional funding is needed for development of phase identification tool for low voltage cables and installation of micro RTUs.
92352	NETWORK FEEDER DISCONNECT SWITCH DEVELOPMENT	\$ 490,000	\$ 447,561	\$ 42,439	6/20/2007 10/08	N/a	N/a	N/a	\$ 378,469	\$ 69,092	\$ 50,000	\$ 62,089	\$ -	\$ -	\$ -	Electric Operations has identified storm surge flooding as a credible risk to its network distribution system, especially in lower Manhattan.
92359		\$ 145,000	\$ 140,934	\$ 4,066	3/6/2006 06/08	N/a	N/a	\$ -	\$ 21,445	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	This project designs, develops and test-certifies a small high-capacity submersible disconnect switch to mitigate the potential damage.

DISTRIBUTION EQUIPMENT REPLACEMENT RANKING AND VISUALIZATION TOOL

For the past ha years, Columbia University has been developing computer intelligence sohare needed for determining the best designs for the transition to Condition Based Maintenance (CBM). Working with distribution engineering and electric operations, Columbia University used machine learning algorithms to develop a predictive tool to identify not only which feeders are likely to fail in the following summer but also which component and the location of the component. They have also evaluated the effectiveness of the Hi-Pot testing program and refined the program operation in order to further lower OAs during the following summer. The goal is to develop a fix-before- break program for our distribution cables and joints. To facilitate optimization of a replacement strategy, one visualization and ranking tool that combines PILC, reinforcement and reliability replacement is needed.

92363	NETWORK DUCT RECLAMATION SYSTEM	\$ 135,000	\$ 123,165	\$ 11,835	6/27/2007 06/08	N/a	N/a	N/a	\$ 143,165	\$ (20,000)	\$ -	\$ (20,000)	\$ -	\$ -	-	-
92378	VACTOR TRUCK JOB ASSIGNMENT AND MONITORING DEMONSTRATION	\$ 150,000	\$ 149,980	\$ 20	1/25/2002 06/08	\$ 53,549	\$ 7,863	\$ 7,863	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
92382	EPRI/NYSERDA/DOE TRAVEL BY ALL OTHER NON-R&D PERSONNEL	\$ 150,000	\$ 422	\$ 149,578	6/28/2007 01/09	N/a	N/a	N/a	\$ 422	\$ -	\$ 65,000	\$ 130,000	\$ -	\$ -	-	-
92394	URBAN FOREST PREDICTIVE MODEL AND RISK MITIGATION DEVELOPMENT	\$ 120,000	\$ 105,982	\$ 14,018	1991-01-01 Ongoing	\$ 8,580	\$ 10,445	\$ 10,445	\$ 31,748	\$ 6,551	\$ 25,000	\$ 25,000	\$ -	\$ -	-	-
92401	ELECTRIC SYSTEM MODEL BUILDING & MAINTENANCE TOOL DEVELOPMENT AND DEMONSTRATION - PHASE I	\$ 186,000	\$ 94,382	\$ 91,618	7/9/2007 09/07	N/a	N/a	N/a	\$ -	\$ 94,382	\$ -	\$ 156,000	\$ -	\$ -	-	-
92405	PHASE IDENTIFICATION TOOL-DEMONSTRATION	\$ 189,000	\$ 188,250	\$ 750	7/16/2007 06/08	N/a	N/a	N/a	\$ 188,250	\$ -	\$ -	\$ -	\$ -	\$ -	-	-
92410	COMBINED HEAT AND POWER SYSTEMS (CHP) DEMONSTRATION PROJECT	\$ 25,000	\$ 28,255	\$ (3,255)	7/17/2007 09/08	N/a	N/a	N/a	\$ 13,000	\$ 8,475	\$ 25,000	\$ 25,000	\$ -	\$ -	-	-
92411		\$ 110,000	\$ 50,280	\$ 59,720	4/22/2002 12/05	\$ (25,700)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	-

Develop and demonstrate a cost effective system that will allow us to reclaim ducts that are obstructed by burned or broken cables. The Edison project team of Electric Operations are looking at opportunities to identify and to remove inefficiencies in work processes and have identified the management of Vactor trucks as an area to be assessed and researched. Con Edison's Vactor Trucks in Brooklyn/Queens and Bronx/Westchester service areas have been outfitted with GPS units and supervisors have been given client software that permits them to monitor the position of the trucks on a map display. A follow-on effort has been identified to increase the functionality and performance of this capability. We would like to add "drag-and-drop" Vactor job assignment and dispatching by adding new elements to the map display, starting with job locations and job details. Also, the Vactor truck operation group would like to explore opportunities to develop optimized job assignments.

Facilitate application of new technologies by supporting employee attendance at industry meetings. Over a nine-month period in 2006, the company experienced four major outage events on its distribution system. Three of these events impacted the overhead energy delivery infrastructure in Westchester County and it is estimated that more than 50 percent of the outages experienced by customers during major storms in Westchester have been caused by tree-related damage. It is possible that systemic issues in the urban forest in Westchester may be the cause of the extensive damage. We seek a predictive tool and risk mitigation strategy to better prevent damage and maintain reliable electric service to overhead customers. The company is engaged in developing an integrated electric system model both to evaluate alternate infrastructure designs and to improve system intelligence, reliability and efficiency. Current models do not support these needs, and a significant upgrade is needed. Initial model development work looks promising, and has identified one of the hurdles that must be overcome as building the new models from the components in the present models. We seek a computer tool that will automate the model building, anomaly identification and update maintenance of the new model. The original appropriation is being increased to cover the unanticipated cost of the field trials and iterative enhancements.

A number of preliminary tests have been performed in the field with the FC2200 cable phase identification system manufactured by ndb technologies. Initial test results were promising but additional tests need to be performed several devices will be purchased and given to workers in various boroughs for further evaluation. Provide the technical and economical assessment of DG and CHP technology and demonstrate advanced microturbine designs and their feasibility for small business applications.

WORK AND OPERATIONS MANAGEMENT SUPPORT SYSTEM FOR LOWER MANHATTAN DEVELOPMENT										Identify, assess, develop, and facilitate the integration of information needed for an infrastructure technology solutions and intelligent management system for the planning, construction and maintenance activity within lower Manhattan.									
92414	GROUND PENETRATING RADAR ROADWAY INTEGRITY INSPECTION	\$ 90,000	\$ 117,000	\$ (27,000)	4/20/2006	12/06	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Verify the application and accuracy of the Ground Penetrating Radar technology for roadway integrity. We will scan, evaluate the results, and then make a determination of the validity of this technology. The added bonus is that the maps generated of the underground structures can be compared to our current maps and used as a bi-directional validation process.	
92416	HIGH TENSION MONITORING DATA ACQUISITION SYSTEM	\$ 50,000	\$ 34,342	\$ 15,658	5/2/2006	06/08	N/a	N/a	\$ -	\$ (259)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	This project seeks to demonstrate the ability to deliver load information from HT vaults using revenue meters and to develop interface to VDAMS and other databases and applications that are used for power quality information.	
92420	CEA - TRANSMISSION INFRASTRUCTURE PROTECTION PROJECTS	\$ 193,000	\$ 140,562	\$ 52,438	5/4/2006	10/08	N/a	N/a	\$ -	\$ 87,591	\$ (1,431)	\$ -	\$ (1,310)	\$ -	\$ -	\$ -	\$ -	Transmission Infrastructure Protection is a continuing concern that warrants additional research and development in best.practices and new products. This funding will enable collaboration with other utilities via the CEA (Canadian Electric Association) on projects to investigate, understand and help solve Transmission Infrastructure Protection Issues.	
92430	CEA - DISTRIBUTION ASSET LIFE CYCLE MANAGEMENT PROJECTS	\$ 50,000	\$ -	\$ 50,000	7/13/2007	01/09	N/a	N/a	N/a	\$ 7,500	\$ (7,500)	\$ -	\$ (7,500)	\$ -	\$ -	\$ -	\$ -	Enable collaboration with other utilities via the CEA on projects to investigate and understand distribution life cycle management issues.	
92436	STATEN ISLAND CUSTOMER LOAD MODELS REFINEMENT	\$ 50,000	\$ 18,155	\$ 31,845	7/31/2007	03/09	N/a	N/a	N/a	\$ 11,894	\$ 6,261	\$ -	\$ 6,261	\$ -	\$ -	\$ -	\$ -	Staten Island is currently developing models for performing analysis of the electric distribution system to ensure distribution devices and services are adequate to meet peak load conditions experienced and forecasted load growth Distribution.	
92443	KNOWLEDGE BASE CAPTURE DEMONSTRATION	\$ 240,000	\$ 19,574	\$ 220,426	8/16/2007	08/08	N/a	N/a	N/a	\$ -	\$ 19,574	\$ 120,000	\$ 120,000	\$ -	\$ -	\$ -	\$ -	The equipment that is part of the Con Edison infrastructure spans on the order of 100 years. Over that time there have been many changes to many hardware designs and a continuing evolution of technologies. Utility knowledge is in many cases more detailed than that of vendor's because it includes experience not only with the design and fabrication of equipment and systems, but on the interconnected infrastructure's operation, maintenance and failure modes over time, and its interaction with system conditions, abnormal events and environments. This experience base is extremely valuable, particularly with regard to: - complex devices such as circuit breakers and transformers, - potential impacts of both the best and problematic practices for installation, operation, testing and maintenance and - understanding the strengths, weaknesses and susceptibilities of the various vintages of equipment and designs that are part of our electric, gas and steam infrastructures. In addition this type of valuable experience applies to specialized historical knowledge of specific items like: - our relationships with our largest customers (e.g. transit authority and NYCDOT Street Lighting) and their most serious needs and concerns - EMS and Distribution Control Center history and operations, The project team will define a minimum set of tests to ensure that a firmware upgrade has not degraded the ability of the relays to perform their primary functions.	
92445	VERSION CONTROL FOR INTELLIGENT ELECTRICAL DEVICES	\$ 150,000	\$ 116,914	\$ 33,086	5/18/2006	12/09	N/a	N/a	\$ -	\$ (165,012)	\$ 35,579	\$ -	\$ 35,579	\$ -	\$ -	\$ -	\$ -	Presently, during adverse system conditions and for multiple contingencies, distribution system operators have little effective control or influence on the load being demanded by customers. Programs such as EDRP, CRICAP and DLRP provide neither the quantity nor the granularity required for secondary load pocket issues or even network supply issues, and telephone calls for VLR are slow, unsure and nearly immeasurable. The DLC program comprises only 30 MW out of 13,000' total and is too sparse to provide real benefit at the network level. PLVO can provide benefit at the network level, but that benefit diminishes as contingency levels escalate. We seek increased availability, ease of access and greater se of distributed energy resources (DSM + DG) for providing power or reducing demand during peak load periods and during adverse system conditions.	
92449	DOE - DISTRIBUTED SYSTEMS INTEGRATION	\$ 25,000	\$ 20,000	\$ 5,000	5/18/2006	05/07	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Investigate the applicability of more precise weather forecasting capability by utilizing finer resolution forecasting models in conjunction with several local stand-alone weather stations. To develop ARTIS and CDPD wireless channels to bring met3ering data to our existing MV-90 system.	
92454	DEMONSTRATION OF PRECISE WEATHER FORECASTING FOR CON EDISON OPERATIONS	\$ 1,669,000	\$ -	\$ 1,669,000	8/23/2007	12/10	N/a	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ 348,000	\$ 208,000	\$ -	\$ -		
92458	DOE - INTEROPERABILITY OF DEMAND RESPONSE RESOURCES	\$ 140,000	\$ 170,671	\$ (30,671)	6/6/2006	12/08	N/a	N/a	\$ -	\$ 33,280	\$ 31,086	\$ 50,000	\$ 50,000	\$ -	\$ -	\$ -	\$ -		
92467	RESOURCES	\$ 730,000	\$ -	\$ 730,000	8/23/2007	12/08	N/a	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ 288,000	\$ 227,000	\$ 215,000	\$ -		

NETWORK FEEDER FAST SWITCH DEVELOPMENT															Strategic placement of fast switches will allow for rapid load transfer between substations and networks. This is required for the system of the future. This switch can be used in new or existing SF6 switch installations and it will require less room. The submersible properties of the fast switch will allow to rapidly deenergize portion of a network feeder in case of a major storm surge.
92479	INTEGRATED COMMUNICATIONS STRATEGY - PHASE I	\$ 150,000	\$ 155,553	\$ (5,553)	8/31/2007 04/08	N/a	N/a	N/a	\$ -	\$ 140,553	\$ -	\$ 135,000	\$ -	\$ -	Con Edison is undertaking several business initiatives for improving the effectiveness, reliability, and outage recovery of the distribution system. These initiatives include. But are not limited to: AMI deployment, RMSx demonstration, high tension vault monitoring, secondary networks monitoring, 3G, substation automation, etc. These and other related programs need to be adequately supported by enabling communications systems that are reliable and cost effective. This is a corporate-wide initiative with the objective to develop a long range strategy related to communications in our business. We plan to hire a consulting firm to help us develop this strategy. This project will be structured into a series of complimentary and comprehensive tasks that will yield a roadmap of networks, development, and target designs, cost/benefit estimates and implementation plans. Phase I of the project will target business requirements and forecast, market and technology analysis, business case, and support for the rare case.
92482	NEXT GENERATION PLATFORM TO LEVERAGE POWER	\$ 150,000	\$ 117,364	\$ 32,636	9/5/2007 03/08	N/a	N/a	N/a	\$ 20,518	\$ 96,846	\$ -	\$ 80,000	\$ -	\$ -	Via multi-member EPRI tailored collaboration develop additional PQ
92487	SYSTEM DATA	\$ 50,000	\$ 50,000	\$ -	9/18/2007 12/09	N/a	N/a	N/a	\$ 50,000	\$ -	\$ -	\$ -	\$ -	\$ -	software to further leverage value of power system data.
92491	BLOWN LIMITER INDICATION TOOL- DEVELOPMENT/DEMONSTRATION	\$ 285,000	\$ 40,500	\$ 244,500	9/20/2007 11/08	N/a	N/a	N/a	\$ -	\$ 40,500	\$ 200,000	\$ 200,000	\$ -	\$ -	To develop a testing tool to verify correct wiring of RMS installations into network protectors.
92491	DEVELOPMENT OF NASA TECHNOLOGY TO UTILITY APPLICATION	\$ 285,000	\$ 40,500	\$ 244,500	9/20/2007 11/08	N/a	N/a	N/a	\$ -	\$ 40,500	\$ 200,000	\$ 200,000	\$ -	\$ -	Investigate the applicability of NASA developed technology and techniques to Con Edison specific electric operations problems.
92601	SUBSTATION ALIVE-ON-BACKFEED RMS DEVICE	\$ 150,000	\$ 88,832	\$ 61,168	3/11/2003 12/05	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Investigate the merits and capabilities of new and innovative concepts in computing technology and information management systems. Explore alternative for affordable cross- platform data access and data integration solutions that would reduce the complexity of the current information system
92607	SELECTABLE RF COMMUNICATIONS FOR ADVANCED METERS	\$ 250,000	\$ -	\$ 250,000	9/25/2007 08/08	N/a	N/a	N/a	\$ -	\$ -	\$ 60,000	\$ 60,000	\$ 100,000	\$ -	infrastructures. This project will allow Con Edison to successfully complete the current installation plan for remotely collecting data from TRACTION accounts. If this solution is made available soon enough it allows CE to switch over (from CDPD) to a solution that will be supported for many years to come without interruption. The project has hardware, software and communication components. Specific developments include board design for the meters, software in the form of protocols to negotiate communications with the meters and firmware / communication drivers for the various modems.
92629	DRY ICE BAGS-DEVELOPMENT / DEMONSTRATION	\$ 50,000	\$ 25,000	\$ 25,000	5/21/2003 12/04	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Several preliminary tests have proven that Tedlar polyvinyl fluoride (PVF) film can be used to develop bags for dry ice. The properties of this material include resistance to weathering, outstanding mechanical properties, and inertness towards a wide variety of chemicals and solvents. The challenge is to create a reliable seal around the sides of the bag. We plan to work with vendors to develop 2lx8' bags that would include a hose for dissipation of CO <sub>2</sub> outside of the transformer vault.
92630	EXTERNAL RETROFIT OF SELF-RESET FEATURE FOR HAND	\$ 50,000	\$ -	\$ 50,000	10/11/2007 04/08	N/a	N/a	N/a	\$ -	\$ -	\$ 25,000	\$ 25,000	\$ -	\$ -	Develop an method to retrofit a self reset feature onto existing manual
92661	RESET LOCKOUT RELAYS EPRI TRAVEL BY O&R (9003)	\$ 150,000	\$ 30,531	\$ 119,469	8/15/2006 12/08	N/a	N/a	\$ -	\$ -	\$ -	\$ 60,000	\$ 60,000	\$ -	\$ -	reset Lockout relays.
92662	ZIGBEE PERFORMANCE EVALUATION	\$ 73,000	\$ 28,002	\$ 44,998	12/21/1999 00/00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,000	\$ -	\$ -	Facilitate application of new technologies at Orange and Rockland by supporting employee attendance at industry meetings.
92663	MANHATTAN DISTRIBUTION VISUALIZATION SYSTEM	\$ 50,000	\$ -	\$ 50,000	10/24/2007 04/08	N/a	N/a	N/a	\$ -	\$ -	\$ 25,000	\$ 25,000	\$ -	\$ -	To develop a method to enhance the reliability of auto loops using captured performance data.
92708	ELECTRIC MODEL BULID AND VISUALIZATION - PHASE 0	\$ 230,000	\$ 203,160	\$ 26,840	3/1/2004 12/06	\$ 43,160	\$ 160,000	\$ 160,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	To develop a demo for creating display of AUTO WOLF load flow result and network feedback and transformers using real-time interface to VDAMS. Perform data mining and implement add-on visual toolset for the operators in equipment overload risk analysis.
92709		\$ 50,000	\$ -	\$ 50,000	11/1/2007 04/08	N/a	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	In this effort, we will evaluate the feasibility for accomplishing the above. This work will allow the vendor to complete a through review of our data to determine compatibility and feasibility.

DEMONSTRATION AND EVALUATION OF ENERGY EFFICIENT  
POWER SUPPLIES FOR DESKTOP COMPUTERS AND  
SERVERS

Nearly 2.5 billion electrical products containing power supplies are currently in use in the United States. The total amount of electricity that flows through these power supplies is more than 207 billion kwh/year, or about 6% of the national electric consumption. More efficient designs could save an expected 15 to 20% of that energy. Savings of 32 billion kwh/year would cut the annual national energy bill by \$2.5 billion, displace the power output of seven large powerplants, and reduce carbon dioxide emissions by more than 24 million tons per year. One of the programs to promote more efficient power supplies is the 80 PLUS program. 80 PLUS is an electric utility sponsored program to integrate more energy-efficient power supplies into desktop computers and servers. The 80 PLUS performance specification requires power supplies in computers and servers to be 80% or greater energy efficient at 20%, 50% and 100% of rated load with a true

92714	DEGRADATION OF SECONDARY CABLE AS RELATED TO STRAY VOLTAGE AND MANHOLE EVENTS	\$ 145,000	\$ -	\$ 145,000	11/7/2007	11/08	N/a	N/a	N/a	\$ -	\$ -	\$ 45,000	\$ 23,000	\$ 70,000	\$ -	\$ -	-	-
92716	EFFECTS OF VOLTAGE REDUCTION ON ELECTRICAL EQUIPMENT USING ELECTRONIC CONTROL - LITERATURE SEARCH	\$ 290,000	\$ 174,161	\$ 115,839	9/29/2006	06/08	N/a	N/a	\$ -	\$ 90,975	\$ 83,186	\$ -	\$ 126,186	\$ -	\$ -	\$ -	\$ -	-
92717	CHARACTERIZATION OF ARCING FAULT SIGNATURE	\$ 49,875	\$ 49,992	\$ (117)	10/5/2006	06/08	N/a	N/a	\$ -	\$ (1,013)	\$ 11,119	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92718	DEVELOPMENT OF MESH COMMUNICATION HARDWARE FOR uRTU AND HTMDAS SENSORS	\$ 35,000	\$ 27,546	\$ 7,454	10/6/2006	06/08	N/a	N/a	\$ -	\$ 27,546	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92732	PORTABLE SECONDARY RECEIVER FOR NETWORK RMS	\$ 138,000	\$ 20,000	\$ 118,000	11/19/2007	01/08	N/a	N/a	N/a	\$ -	\$ 20,000	\$ -	\$ 125,000	\$ -	\$ -	\$ -	\$ -	-
92745	CURRENT LIMITING CONDUCTORS FOR THE 4KV PRIMARY GRID - FEASIBILITY STUDY	\$ 50,000	\$ 29,000	\$ 21,000	11/30/2007	12/08	N/a	N/a	N/a	\$ -	\$ 29,000	\$ -	\$ 45,000	\$ -	\$ -	\$ -	\$ -	-
92759	CURRENT LIMITING DEVICE - PRACTICALITY FOR NETWORK TRANSFORMERS	\$ 75,000	\$ 132,147	\$ (57,147)	12/6/2006	12/08	N/a	N/a	\$ -	\$ 66,039	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92769	SECONDARY FAULT LOCATER	\$ 50,000	\$ -	\$ 50,000	1/4/2008	07/08	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	-
92772	FIREPROOF COATING DEVELOPMENT FOR ARC TAPE	\$ 35,000	\$ 31,500	\$ 3,500	12/6/2006	06/08	N/a	N/a	\$ -	\$ 31,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-
92774		\$ 50,000	\$ 19,527	\$ 30,473	12/13/2006	06/08	N/a	N/a	\$ -	\$ 28,527	\$ (9,000)	\$ -	\$ (9,000)	\$ -	\$ -	\$ -	\$ -	-

power factor of 0.9 or greater. This makes an 80 Plus Characterize failure mechanisms for most common secondary cable construction types by performing mechanical, electrical, and other experiments. Investigate the effects on load equipment that utilizes electronic control as a result of voltage reduction.

In this project, we will employ TESS of Texas A&M University to review the data collected in relation to the arcing fault project. TESS will use their extensive experience in characterization of arcing faults to prepare a list of recommendations for further work. Develop a system which will assess power quality disturbance data, determine causes, and evaluate possible solutions using advanced computer processing technique.

Develop, design and manufacture a portable secondary receiver for our network remote monitoring system that would provide access to the power line carrier signal for a feeder that has tripped at a substation and whose normal path is lost once the supplying feeder breaker opens. Installation of the USA (Unit Substation Automation) system has enabled us to accurately monitor the flow of power on our Unit Substation transformers and 4 kV network distribution system. Under contingency conditions, such as the loss of a unit substation, some of the 4 kV feeders or other unit substations may experience overloads even though there is still sufficient capacity in the grid. Analysis of the data showed that MW and MVAR flows are less than optimal resulting in poor power factors. This condition can lead to overloading of unit substation transformers requiring them to be replaced at substantial costs.

Application of current-limiting devices on network feeders, although capable of limiting energy input to high-current faults, can have negative impacts in other areas, and these must be fully understood before making any decision to apply them. This project seeks to determine their practicability of application on our system, including evaluation of functional requirements, physical size, protection coordination and impact on work rules. We seek to work with The Von Corporation to develop two sheath/ground fault locator prototypes for evaluation on Staten Island fault sites. After review and approval of prototypes by Staten-Island Construction, The Von Corporation will deliver 2-3 production units for demonstration under field use on secondary URD cables.

Explore the practicality of enhancing arc proof tape with a fire retardent.

COMMON OPERATING PROCEDURE (COP) FOR DISTRIBUTION SYSTEM OPERATIONS - PHASE 0																
92777	FAULT ANALYSIS ON DISTRIBUTION NETWORKS HAVING STATIC CONVERTER SYSTEMS	\$ 50,000	\$ 50,000	\$ -	12/20/2006 06/07	N/a	N/a	\$ -	\$ -	\$ 50,000	\$ -	\$ 100,000	\$ -	\$ -	-	In this Phase 0 project, Sarnoff will work with Con Edison to develop requirements for the COP system for distribution system operations. The requirements will include a storyboard of the proposed system including how to map critical pieces of information to be visualized, how to display real-time events and alarms and how to locate of available resources quickly and efficiently. Preliminary high-level design architecture will be proposed as part of the deliverables. Distributed Generation (DG) is predicted to play an increasing role in the electric power system of the near future. Existing distribution systems were designed to operate without any generation on the network itself or at the customer sites. The introduction of generation sources on the distribution system can significantly impact the flow of power and voltage conditions at customer and utility equipment. It is critical that the power system impacts be assessed accurately so that these DG units can be applied in a manner that avoids degradation of service, such as power quality, reliability, and control of the utility system.
92778	SCADA IMPLEMENTATION ON NETWORK SUBMERSIBLE SWITCHES	\$ 148,500	\$ 44,394	\$ 104,106	12/20/2006 12/08	N/a	N/a	\$ -	\$ 44,394	\$ -	\$ -	\$ -	\$ -	\$ -	-	Network submersible switches are applied on the distribution network feeders to isolate faults allowing the operator to expedite the restoration of the unfaulted feeder sections. Various studies performed by Distribution Engineering have suggested that use of these switches during network contingencies greatly improves the reliability of the network system and reduces the likelihood of network jeopardy. These switches have been deployed at many locations on the Con Edison's system, however currently, operation of these switches requires manual intervention causing delays in the restoration process. Such delay could contribute significantly to the likelihood of cascading failures during severe contingencies in the network.
92779	AUTO-LOOP RELIABILITY IMPROVEMENT BY ENHANCED COMMAND & CONTROL DEMONSTRATION AND FEASIBILITY STUDY	\$ 270,000	\$ 196,398	\$ 73,602	9/27/2006 12/08	N/a	N/a	\$ -	\$ 176,889	\$ 19,508	\$ 50,000	\$ 70,000	\$ -	\$ -	-	Develop a ride-through mechanism for elevator drive systems during voltage anomalies.
92780	GRID AGENTS TO SUPPORT ADVANCED DISTRIBUTION OPERATIONS	\$ 475,000	\$ 93,102	\$ 381,898	12/31/2007 12/08	N/a	N/a	N/a	\$ -	\$ 93,102	\$ -	\$ 375,000	\$ -	\$ -	-	The 3G System of the Future Project (SOF) is currently developing the infrastructure designs that will have the flexibility to accommodate many future scenarios while enhancing robustness of the energy delivery to our consumers. One challenge is to develop the distribution control strategies for optimizing asset utilization, reliability, power quality, and security.
92786	DEW DYNAMIC MODEL DEVELOPMENT	\$ 150,000	\$ 3,013	\$ 146,987	1/8/2008 12/08	N/a	N/a	N/a	N/a	\$ 3,013	\$ 4,000	\$ 10,000	\$ -	\$ -	-	Con Edison is building electric system analysis models with the capability of analyzing network systems at the secondary level. Thus far, one model, Sutton Network, has been built in DEW (Distribution Engineering Workstation) as a proof of concept. The model provides for loadflow and reliability analysis on a static system. Real-time analysis is desirable in order to assess system conditions as contingencies and events occur on the system.
92788	HOUSE SHUNT TRANSFORMER	\$ 395,000	\$ 6,438	\$ 388,563	1/8/2008 12/08	N/a	N/a	N/a	N/a	\$ 6,438	\$ 100,000	\$ 395,000	\$ -	\$ -	-	Provide the capability for 240 volt power to be supplied from a single 120 volt phase or from a service with an open neutral (and two good phases). Engineer and construct 30 prototype units in accordance with the requirements of Underwriters Laboratories.
92793	REAL TIME FAULT LOCATION SYSTEM	\$ 40,000	\$ 19,865	\$ 20,135	12/21/2006 06/08	N/a	N/a	\$ -	\$ 19,865	\$ -	\$ -	\$ -	\$ -	\$ -	-	Develop and demonstrate a real time fault locating system.
92794	CHARACTERIZATION OF ARCING FAULT SIGNATURE PHASE I	\$ 1,550,000	\$ 1,096,778	\$ 453,222	11/19/1996 12/08	\$ (800)	\$ 15,001	\$ 15,001	\$ 33,433	\$ -	\$ 50,000	\$ 50,000	\$ 100,000	\$ 100,000	\$ -	Conduct demonstrations of the Vector/Hydrochem method and other potentially viable PCB remediation processes to assess performance for PCB decontamination of gas mains.
92798	DEW CIRCUIT BUILDER FOR WESTCHESTER	\$ 1,430,000	\$ -	\$ 1,430,000	1/21/2008 12/09	N/a	N/a	N/a	N/a	\$ -	\$ 350,000	\$ 940,000	\$ 490,000	\$ -	-	Con Edison is building electric system analysis models with the capability of analyzing non-network systems and 4 kV primary grids. Thus far, one non-network model in Staten Island has been built in DEW (Distribution Engineering Workstation) as a proof of concept in order to move the model building to product production, a circuit builder is needed to easily build and maintain models in DEW. A circuit builder that can facilitate of models in Westchester currently do not exist.
92799		\$ 385,000	\$ 6,188	\$ 378,813	1/24/2008 12/08	N/a	N/a	N/a	N/a	\$ 6,188	\$ 47,000	\$ 350,000	\$ -	\$ -	-	

COMMERCIAL BUILDING LOAD COMPOSITION MODEL														The objective of the project is to develop a composite load profile model of representative commercial and residential buildings in our service territory.		
92255	ADVANCED CUSTOMER COMMUNICATIONS TECHNOLOGY (ACCT)	\$ 300,000	\$ 146,205	\$ 153,795	7/8/1998 10/05	\$ 1,988	\$ (6,749)	\$ (6,749)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	Develop, design, and demonstrate an advanced load limiting/disconnecting meter collar for residential meter applications
92747	PARTIAL DISCHARGE DIAGNOSTICS FOR SEPARABLE CONNECTORS - FEASIBILITY STUDY	\$ 3,300,000	\$ 2,794,162	\$ 505,838	7/8/1996 06/08	\$ 257,666	\$ 306,291	\$ 306,291	\$ 22,166	\$ 6,813	\$ -	\$ 2,019	\$ -	\$ -	-	On May 5, 2006, a Distribution Splicer received burns to his right leg and other minor burns. He was splicing primary cable in a disconn manhole structure when an "H-type" disconnect failed in that manhole. From the available evidence the most likely initiating event was electrical tracking on the 6-phase, load-side connecting plug. Detection of precursor conditions, such as partial discharge, could allow
92789	ADVANCED DG INTERCONNECTION: PHASE 1	\$ 75,000	\$ 45,631	\$ 29,369	1/5/2007 06/08	N/a	N/a	N/a	\$ 66,688	\$ (21,057)	\$ -	\$ (21,057)	\$ -	\$ -	-	splicers to evaluate equipment before entering a manhole. To develop computer screens to display dates the data is being collected by several network protector
92475	STRAY VOLTAGE MONITORING AND COMMUNICATION VIA RMS	\$ 150,000	\$ -	\$ 150,000	9/20/2007 01/09	N/a	N/a	N/a	\$ -	\$ -	\$ 100,000	\$ 100,000	\$ -	\$ -	-	relay monitoring control systems. A system to monitor and communicate stray voltage conditions in service box currently does not exist and much work is needed to develop a system that is
92047	DESIGN AND DEVELOPMENT OF A HYBRID MANHOLE COVER	\$ 150,000	\$ 48,525	\$ 101,475	9/29/2004 12/05	\$ -	\$ 34,083	\$ 34,083	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	economically viable. Explore alternative materials, such as composites, for manhole covers as a means to decrease public risk to injury.
92103	DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE AND MANHOLE EVENTS ANALYSIS - PHASE 3	\$ 320,000	\$ 138,279	\$ 181,721	1/28/2005 01/08	\$ -	\$ -	\$ -	\$ 105,869	\$ -	\$ -	\$ -	\$ -	\$ -	-	Con Edison Underground Distribution system consists of approximately 300,000 structures. In 2007, we recorded approximately 130 shock incidents and 2100 manhole events consisting of explosions, fires and smokers. To better design mitigation techniques, we need to identify those factors that are significantly correlated to these events. The ability to identify those structures that are most vulnerable to such events will also help us prioritize and target our spending more
92106	SECONDARY MAINS ARCING FAULT DETECTION AND LOCATION	\$ 385,000	\$ -	\$ 385,000	2/12/2008 07/08	N/a	N/a	N/a	N/a	\$ -	\$ 180,000	\$ 385,000	\$ -	\$ -	-	effectively. Detect and locate arcing faults on utility secondary
92110	WIDE AREA MONITORING AND COMMUNICATION ON UNDERGROUND SECONDARY	\$ 395,000	\$ 244,408	\$ 150,592	2/9/2005 12/08	N/a	\$ 281,408	\$ 281,408	\$ -	\$ -	\$ 100,000	\$ 100,000	\$ -	\$ -	-	network systems. Magnetek has developed a flexible monitoring and control system for streetlights. Their system uses the power line as the communications backbone. Their collector unit is capable of receiving and sending data up to 400 monitoring/control devices via the power line. In Phase 1 of this project, 25 devices were installed in order to evaluate their communication system. The test indicates that the technology is promising for implementing on our distribution system. In this project, we will proceed to Phase II where we will incorporate stray voltage
92123	SECONDARY MAINS ARCING FAULT DETECTOR SIMULATION AND TEST	\$ 150,000	\$ 86,967	\$ 63,033	2/11/2005 06/06	N/a	\$ 45,988	\$ 45,988	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	sensors onto the monitoring device. Arcing faults can cause the formation of combustible gases which lead to manhole explosions. Electrification events may also be associated with arcing faults on the secondary network mains and/or services. There are no devices to detect, locate or prevent such a fault. A 1997 R&D project sought a method of detecting such faults by staging arcing faults, measuring the resultant voltage and current waveforms and determining if microprocessor network protector relays could detect and discriminate the event. The results showed some signature that could be recognized by an enhanced relay, but locating the source proved to be problematic.
92193	PHASE III COMPOSITE COVER LOADING	\$ 350,000	\$ 152,198	\$ 197,802	6/24/2005 07/07	N/a	\$ 47,400	\$ 47,400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	-	Distribution Engineering is evaluating the possibility of using non-metallic, non-conductive, composite materials as an alternative to cast iron manhole covers and cast iron or steel trench panels for service boxes, using venthole designs. Their evaluation will be done through a series of extensive tests to prove how durable Structural Science's prototype covers are. EPRI has performed blast tests on the S-type trench panels to determine how well the covers stand up to simulated feeder gas explosions. Both Structural Science and Lucius Pitkin performed static and fatigue tests to determine the durability of the panels to repeated loading simulating traffic urban load.
92349	STRAY VOLTAGE MITIGATION - CEA PROJECTS	\$ 225,000	\$ 211,086	\$ 13,914	2/28/2006 06/08	N/a	N/a	\$ -	\$ 103,800	\$ -	\$ -	\$ -	\$ -	\$ -	-	In the first of these projects we will develop a guidebook for stray
92409		\$ 50,000	\$ -	\$ 50,000	4/7/2006 04/08	N/a	N/a	\$ -	\$ (15,000)	\$ -	\$ -	\$ -	\$ -	\$ -	-	voltage in high density environments.

DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE  
AND MANHOLE EVENTS ANALYSIS - PHASE II

Con Edison Underground Distribution system consists of approximately 300,000 structures. In 2005, we recorded approximately 230 shock incidents and more than 2,300 manhole events consisting of explosions, tires and smokers. To better design mitigation techniques, we need to identify those factors that are significantly correlated to these events. The ability to identify those structures that are most vulnerable to such events will also help us prioritize and target our spending more effectively. In 2007, Columbia University conducted a Phase 1 study and performed exploratory work on secondary network failure data and the related trouble ticket data. After much data cleanup, a baseline model for the precursor ranking problem has been developed. Additional work in machine learning is required to develop a usable ranked list.

92440	STRAY VOLTAGE MITIGATION PROGRAM EVALUATION	\$ 493,000	\$ 486,295	\$ 6,705	8/16/2007 06/08	N/a	N/a	N/a	\$ 486,296	\$ (1)	\$ -	\$ (1)	\$ -	\$ -	-	In this project, the Risk Research Group will use statistical analysis on data collected over the past two years to evaluate the stray voltage mitigation program. The study will predict the likelihood of stray voltage events in any structure and evaluate the cost benefits of remedial actions. Programs or combination of programs which will best mitigate the stray voltage problem will be identified.
92667	EVALUATION OF DISTRIBUTION SYSTEM HARMONIC CURRENTS AND THEIR EFFECT ON GROUND CURRENTS	\$ 39,000	\$ 14,625	\$ 24,375	12/20/2006 12/08	N/a	N/a	\$ -	\$ 16,000	\$ (1,375)	\$ -	\$ (1,375)	\$ -	\$ -	-	We have experienced increasing neutral current on distribution circuits, and power quality monitors indicate that the harmonic content of this neutral current is significant. Excessive neutral currents can cause relays to misoperate leading to outages, since 3rd harmonics appear in substation neutrals. Ground currents can also cause touch potential problems and customer issues. Other concerns include potential overloading of grounding transformers or substation and distribution transformers.
92676	STRAY VOLTAGE SENSOR FOR TRANSFORMER VAULT GRATINGS	\$ 176,000	\$ 116,375	\$ 59,625	9/23/2003 06/08	\$ 375	\$ -	\$ -	\$ 98,000	\$ -	\$ -	\$ -	\$ -	\$ -	-	Presence of stray voltages on our secondary distribution structures poses a significant threat to public safety. At present there are no monitoring system for stray voltages on our structures. A sensor for stray voltage must be designed to provide isolation from voltages within the comparative and communication device modules. This is necessary to ensure that no voltages are introduced on the gratings causing undesirable hazards to pedestrians. Development of a system that can endure the harsh environment in our service territory presents a unique challenge.
92735	IMPROVED EARLY DETECTION OF URBAN STRAY VOLTAGE CONDITIONS	\$ 150,000	\$ 21,948	\$ 128,052	10/6/2006 12/08	N/a	N/a	\$ -	\$ 21,948	\$ -	\$ -	\$ -	\$ -	\$ -	-	Stray voltages present a hazard to people or animals that may come into contact with an energized surface. There exist more than 730,000 underground and overhead electrical structures and street lights in the company franchise area and we need to develop suitable hardware and analytical tools to advance the state-of-the-art in detecting pre-cursor events that ultimately result in inadvertent energization, and providedirectional capabilities for detection of energized objects where overhead power lines may interfere with existing early detection methods.
92758	SUBMERSIBLE FAST SWITCH FOR LOAD & CAPACITY TRANSFERS	\$ 250,000	\$ 211,000	\$ 39,000	12/24/2007 08/09	N/a	N/a	N/a	\$ 105,500	\$ 105,500	\$ 100,000	\$ 105,000	\$ -	\$ -	-	The need for a fast switch was identified as part of the System of the Future efforts, and because of the potential size of effort was segregated and issued as a separate RADPAR. The capability to switch loads between networks and transfer spare capacity between substations is essential to improving the existing asset utilization on the Con Edison system. A compact submersible switch would allow the transfer device to be installed within a vault under city streets, which would allow existing adjacent feeders and ducts to be used to create these transfer capabilities without physically extending both feeders involved in the transfer scheme back to a common location within a substation. A fast transfer capability could support a transfer scheme that would not require "break-before-make" momentary customer interruptions, and thereby would preserve our very high customer perceived reliability.
92457		\$ 2,250,000	\$ 152,077	\$ 2,097,923	5/17/2006 12/08	N/a	N/a	\$ -	\$ 76,569	\$ 21,508	\$ 750,000	\$ 750,000	\$ -	\$ -	-	



DARWIN ZERO-CROSSING SWITCH PILOT DEMONSTRATION														Repair frequency and obsolescence problems are increasing with the aging of original lighting and control equipment associated with our Transmission Lines. Due to item by item repairs of aging equipment major class and stock consolidations may also be possible. Transmission Line tower, navigation and span lighting and control systems have regulatory requirements, which are not clearly identified on existing drawings and purchase documents. Maintenance and obsolescence problems are increasing with the age of this equipment. In addition new lighting technologies may provide less costly energy usage, longer equipment life and reduced maintenance requirements.		
92613	SUPERCONDUCTING CABLE AND FAULT CURRENT LIMITER DEMO AT 75TH AND YORK	\$ 300,000	\$ -	\$ 300,000	9/26/2007 12/09	N/a	N/a	N/a	\$ -	\$ -	\$ 100,000	\$ 150,000	\$ -	\$ -	-	Based on an opportunity offered by the Department of Homeland Security and American Superconductor, Con Edison is finalizing plans for a combined demonstration of a superconducting cable and fault current limiting capability that would enable network to network interconnections and more effective sharing of assets between substations to improve the resiliency and reliability of the New York City grid. The program is developing for demonstration a new type of inherently fault current limiting superconducting cable, and will also include parallel development efforts for a 13kV 4000 amp stand alone fault current limiter
92721	SYSTEM OF THE FUTURE (FORMERLY FUTURE SUBSTATION DESIGN)	\$ 3,000,000	\$ -	\$ 3,000,000	11/16/2007 12/11	N/a	N/a	N/a	\$ -	\$ -	\$ 225,000	\$ 250,000	\$ 750,000	\$ 750,000	\$ 500,000	o Con Edison is supportive of superconducting technology, because we see superconducting as a way to meet the special needs of dense urban utilities with regard to severe underground physical congestion routing between substations and future potential for size reductions of specific devices like power transformers.
92741	<b>SUBTOTAL DISTRIBUTION PROGRAM</b>	\$ 500,000	\$ 386,424	\$ 113,576	4/7/2004 06/08	\$ 20,000	\$ 209,647	\$ 209,647	\$ (6,422)	\$ 12,000	\$ -	\$ 12,000	\$ -	\$ -	\$ -	o Superconducting technology could also support advanced The Substation of the Future RADPAR was originally established for miscellaneous support needs of the Substation of the Future Team, when it was first created, as a separate entity from the 3G Team. Although the two separate Teams established working liaisons cross-participation early in their joint existence, the original focus of the Substation of the Future Team was more focused on new substation configurations that could meet improved asset utilization, shared spares and reduced cost goals and the survey of potentially available new technologies that could help in that effort.
	<b>EH&amp;S PROGRAM</b>	<b>\$ 39,816,075</b>	<b>\$ 16,485,920</b>	<b>\$ 23,330,155</b>		<b>\$ 378,328</b>	<b>\$ 2,590,285</b>	<b>\$ 2,590,285</b>	<b>\$ 4,060,671</b>	<b>\$ 1,287,558</b>	<b>\$ 5,738,000</b>	<b>\$ 10,542,137</b>	<b>\$ 5,409,700</b>	<b>\$ 3,123,000</b>	<b>\$ 500,000</b>	
92374	EPRI/NYSERDA/DOE TRAVEL BY ENVIRONMENTAL AFFAIRS PERSONNEL DEVELOPMENT OF A "CONSEQUENTIAL" LEARNING SIMULATOR FOR SAFETY IMPROVEMENT	\$ 550,000	\$ 299,841	\$ 250,159	1991-01-01 Ongoing	N/a	\$ 4,489	\$ 4,489	\$ 3,677	\$ 1,617	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	Facilitate application of new technologies by supporting employee attendance at industry meetings.
92435	HUMAN FACTORS STUDY	\$ 200,000	\$ 124,917	\$ 75,083	7/20/2007 07/08	N/a	N/a	N/a	\$ 145,664	\$ (20,747)	\$ -	\$ 50,000	\$ -	\$ -	\$ -	Improve the trainee's understanding of the consequences of: a) not following procedures properly; b) not wearing appropriate PPE for the job task; and c) not utilizing safety equipment.
92775	FEASIBILITY ASSESSMENT OF DEICING ALTERNATIVES FOR UTILITIES FACILITIES	\$ 75,000	\$ 52,477	\$ 22,523	12/12/2006 04/08	N/a	N/a	\$ -	\$ 48,971	\$ 3,506	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	The number of OSHA recordable injuries in BronxM/estchester Electric Operations have increased over the last three years. In an effort to reverse the trend of these incidents, a different approach is sought that will investigate the human factors contribution to these accidents, and that will provide recommendations to improve the current safety practices.
92736	ADVANCED FLUORONATED HYDROCARBON TRACER	\$ 25,000	\$ 34,681	\$ (9,681)	3/30/2004 12/05	N/a	\$ 1,335	\$ 1,335	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	This is a proof of concept prototype to test the viability of a link between the Feeder Management System (FMS) and the Mobile Dispatch System (MDS) to provide optimized and secure communications between District Operator, CSA Dispatcher, and Field Crew. If successful, a pilot system will follow.
92224	ANALYZER SYSTEM	\$ 150,000	\$ 159,756	\$ (9,756)	6/15/2001 04/08	N/a	\$ 495	\$ 495	\$ 20,300	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Design a fully electronic control GC using a commercially available column and still detecting PFT within the 2 minute retention time.

RAPID PFT LEAK LOCATION METHOD														The objective of the project is to design, develop, and field test a new PFT instrumentation system which would allow pinpointing of a leak quickly and without feeder de-energization.		
92231	ADVANCED LEAK DETECTION SYSTEM	\$ 680,000	\$ 347,853	\$ 332,147	6/15/1998 12/05	N/A	\$ (9,992)	\$ (9,992)	\$ -	\$ -	\$ -	\$ -	\$ 100,000	\$ 100,000	\$ 100,000	To develop and demonstrate an advanced leak detection system that is based on various network features (such as network topology, cooling segment length, segment pressure drops, valve layout, valve status, dielectric fluid temperature and pressure).
92169	X28 LEAK DETECTION SYSTEM	\$ 361,880	\$ 207,825	\$ 154,055	5/9/2005 08/08	N/a	\$ 216,360	\$ 216,360	\$ (66,460)	\$ -	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ -	The objective of this project is to field test a new algorithm that uses a regression analysis to predict the mass needed to effectuate a complete fill for Natural Gas Vehicle (NGV) fuel tanks. The new algorithm is intended to correct a problem with underfilling of NGV fuel tanks caused by rise in temperature in a cylinder as the vehicle fills. This phenomena, known as the heat of compression, may result in system underfills in the range of 20 to 25 percent for pneumatic control systems and 10 to 15 percent underfills for newer electronic control systems.
92756	DEVELOPMENT OF A SLOW CIRCULATION LEAK DETECTION SYSTEM USING MASS-BALANCE	\$ 120,000	\$ 90,492	\$ 29,508	11/15/2006 10/08	N/a	N/a	\$ -	\$ 90,100	\$ 392	\$ 25,000	\$ -	\$ -	\$ -	\$ -	Con Edison's slow-circulation HPFF feeders, which comprise approximately 20% of the Underground system, do not have leak detection systems. A test system shall be developed and installed on feeders 69M72 and 69M74 at West 19th Street Pressurization Plant #2.
92178	DEVELOPMENT OF NEW FREEZE-THAW METHODS TO REDUCE RECOVERY TIME OF PIPE-TYPE FEEDERS	\$ 135,000	\$ -	\$ 135,000	5/2/2008 08/09	N/a	N/a	N/a	N/a	\$ -	\$ -	\$ 75,000	\$ 60,000	\$ -	\$ -	Investigate, evaluate and test new techniques to reduce freezing and thawing time of the electric cables making the cable feeder operable at the earliest time.
92399	FIELD DEMONSTRATION OF NEW FREEZE / THAW EQUIPMENT FOR PIPE TYPE CABLE	\$ 498,000	\$ 457,566	\$ 40,434	2/11/2002 06/08	N/A	\$ 232,554	\$ 232,554	\$ 200	\$ (790)	\$ -	\$ 16,000	\$ -	\$ -	\$ -	Develop an understanding of the chemical reactions the LTC oil under goes during normal and abnormal operation. Identify compounds that are deleterious to operation and methods for detecting and removing them. Lengthen the LTC maintenance interval by maintaining the necessary chemical parameters of the oil.
92797	DEVELOPMENT OF 345 KV OIL-LESS CABLE SYSTEM	\$ 150,000	\$ -	\$ 150,000	1/10/2008 12/08	N/a	N/a	N/a	N/a	\$ -	\$ 138,000	\$ 138,000	\$ 12,000	\$ -	\$ -	The objective of this project is to develop, test and demonstrate an oil-less 345 kV cable system suitable for either, a retrofit for replacing existing cable sections in a pipe through the use of a transition joint, or as a new installation with a brand new pipe.
92724	SF6 EQUIPMENT LEAK REPAIR	\$ 1,590,000	\$ 1,019,216	\$ 570,784	12/7/1995 12/08	\$ (1,796)	\$ 80,000	\$ 80,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Develop materials and methodologies for reliably identifying and repairing the various types of SF6 leaks that may occur in substation equipment.
92248	IMPACT OF PLUG IN HYBRID ELECTRIC VEHICLES ON UTILITY DISTRIBUTION SYSTEMS	\$ 250,000	\$ 75,778	\$ 174,223	6/15/1998 12/06	N/a	\$ 34,000	\$ 34,000	\$ -	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	To engage TEC Inc. to develop a small durable, self powered, data-capture device that will allow us to simultaneously monitor and record critical data (i.e. oil temperature and neutral current) for analysis that is not readily available via other Con Edison operating systems (e.g. SOCCSX, RMS, etc.). The unit will be designed to operate in a standard street type network transformer vault environment and will be equipped with 8 inputs (4-0 to 5 vdc and 4-0 to 5 amp). This unit is needed to obtain detailed performance data on problematic 27kv grounding transformers.
92166	PLUG-IN HYBRID ELECTRIC VEHICLE PROJECTS	\$ 150,000	\$ 125,000	\$ 25,000	4/21/2008 12/08	N/a	N/a	N/a	N/a	\$ 125,000	\$ -	\$ 150,000	\$ -	\$ -	\$ -	Con Edison will participate in various studies, stakeholder groups and consortia to review the impact and integration of plug-in hybrid electric vehicles on the electric grid.
92403	ELECTRIC VEHICLE TESTING AND MONITORING	\$ 50,000	\$ 20,710	\$ 29,290	7/12/2007 07/08	N/a	N/a	N/a	\$ 14,710	\$ 6,000	\$ 180,000	\$ 150,000	\$ 200,000	\$ 200,000	\$ -	To explore the steps needed to help integrate EV's into our distribution system.
92627	TRACKING FOR VEHICLE	\$ 150,000	\$ 19,563	\$ 130,437	10/16/2007 12/08	N/a	N/a	N/a	\$ 17,556	\$ 2,007	\$ -	\$ 75,000	\$ -	\$ -	\$ -	
<b>SUBTOTAL EH&amp;S PROGRAM</b>		<b>\$ 5,134,880</b>	<b>\$ 3,035,674</b>	<b>\$ 2,099,206</b>			<b>\$ (1,796)</b>	<b>\$ 559,241</b>	<b>\$ 559,241</b>	<b>\$ 274,717</b>	<b>\$ 116,985</b>	<b>\$ 513,000</b>	<b>\$ 774,000</b>	<b>\$ 472,000</b>	<b>\$ 400,000</b>	<b>\$ 100,000</b>
<b>CUSTOMER OPERATIONS PROGRAM</b>																
MONITORING DEVICE FOR UNMETERED SERVICES																
92073	REMOTE CONNECT / DISCONNECT METER COLLAR PILOT	\$ 200,000	\$ 65,674	\$ 134,326	11/16/2004 12/09	\$ -	\$ 16,040	\$ 16,040	\$ 5,759	\$ 1,486	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	To remotely monitor unmetered services using wireless technology.
92076	DEMONSTRATION	\$ 150,000	\$ 42,032	\$ 107,968	12/14/2004 05/05	\$ -	\$ 36,000	\$ 36,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Demonstrate and assess the field performance of about 50 metered disconnect devices for residential as well as small commercial customers.
92480	DEMONSTRATION OF MOBILE COMMUNUCATION AND TRACKING FOR VEHICLE	\$ 145,000	\$ 110,704	\$ 34,296	6/30/2006 06/08	N/a	N/a	\$ -	\$ 40,727	\$ 17,738	\$ -	\$ 9,098	\$ -	\$ -	\$ -	Looking for opportunities to identify and to remove inefficiencies in work processes.
92681	CUSTOMER OPERATIONS NEW VISION WORKSHOP	\$ 150,000	\$ 141,123	\$ 8,877	10/22/2003 06/05	\$ 31,701	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Identify and develop R&D initiatives that could result in cost reductions, improved operational efficiency, and the identification of potential new CO business opportunities.
92015	CURRENT TRANSFORMER DISCONNECT DEVICE	\$ 129,000	\$ 126,000	\$ 3,000	3/16/2007 06/08	N/a	N/a	N/a	\$ 252,000	\$ (126,000)	\$ -	\$ (126,000)	\$ -	\$ -	\$ -	Disconnecting current transformers ( CT) is a delicate operation with respect to employee safety and the time it takes to perform this function. The reason for disconnection of these transformers is primarily due to customers failure to pay their utility bills. Our employees must reach in to the CT cabinet and remove the bolts that secure the lugs while making sure they don't cross phase or short to ground.

92078	WIRELESS WORK MANAGEMENT SYSTEM FOR FIELD OPERATIONS	\$ 145,000	\$ 100,043	\$ 44,957	12/14/2004 06/08	\$ -	\$ 14,355	\$ 14,355	\$ (3,201)	\$ -	\$ 60,000	\$ -	\$ 100,000	\$ 100,000	\$ -	Study current FPET system to determine business needs for a new system. Survey other utilities to assess systems that they are presently using.
92170	O&R CASH BILL PAYMENT KIOSK DEMONSTRATION	\$ 88,000	\$ 69,520	\$ 18,480	5/10/2005 03/06	N/a	\$ 24,000	\$ 24,000	\$ -	\$ (2,472)	\$ -	\$ (2,472)	\$ -	\$ -	\$ -	Design and demonstrate an advanced interactive web-based kiosk with cash payment interface capability for O&R's Service Center environment.
92211	SCORING PROJECT	\$ 100,000	\$ 189,247	\$ (89,247)	8/9/2005 06/08	N/a	\$ 20,000	\$ 20,000	\$ 26,247	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	The main objective of this project is to revamp the entire credit flow & strategies while at the same time reducing cost associated with this process along with helping the Company increase revenue by reducing our UB loss. To create a blended score of customer's behavior with the utility and that of a credit bureau that will predict future payment and losses on customer accounts.
92216	E-SOURCE ENERGY PROGRAM SERVICES	\$ 50,000	\$ 35,750	\$ 14,250	8/9/2005 12/10	N/a	\$ 21,450	\$ 21,450	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	The project objective is to obtain, develop and apply additional Physical Operating Margin Software modules to Transmission Planning applications, and to increase System Operations' familiarity with the capabilities and functionalities with a view toward possible future use of -RT (real time) versions of this software by System Operations and other company organizations. Con Edison's Transmission Planning has been using V&R Energy Systems Research, Inc.'s (V&R) Physical Operating Margin (POM) software module as a direct input to the Transmission Probability Risk Assessment (PRA) model developed by Transmission Planning. V&R was originally selected by an EPRI-Utility evaluation team based on comparisons with other software applications and companies. A major original advantage of the V&R product was its speed in performing power system modeling and contingency analysis. This has been demonstrated its performance for the Con Edison POM-Transmission PRA model, which is able to perform calculations, which previously took days in hours. Since V&R's original selection they have been working with Con Edison, ATC, BPA, Entergy, Idaho Power, NEISO, KCP&L, Keyspan/LIPA, MISO, ONS, NYPA, Tri-State G&T and TVA to enhance the functionality and performance of not only the POM software module, but of many other modules already in use by many of the utility participants.
92375	INTERACTIVE WEB KIOSK FOR UTILITY APPLICATIONS FIELD DEMONSTRATION	\$ 310,000	\$ 284,104	\$ 25,896	12/14/2001 06/08	\$ (133,454)	\$ 66,480	\$ 66,480	\$ (4,772)	\$ 1,970	\$ -	\$ -	\$ -	\$ -	\$ -	The objective of this project is to develop, design, and demonstrate an advanced interactive web based kiosk for Con Edison's business office environment. The main goal of this R&D effort is to provide application feasibility, technical assessment, operating performance, and customer acceptance of this emerging technology.
92387	EPRI/NYSERDA/DOE TRAVEL BY CUSTOMER SERVICE PERSONNEL	\$ 135,000	\$ 113,712	\$ 21,288	1991-01-01 Ongoing	\$ 5,732	\$ 8,738	\$ 8,738	\$ 2,025	\$ 771	\$ 10,000	\$ 12,000	\$ -	\$ -	\$ -	Facilitate application of new technologies by supporting employee attendance at industry meetings.
92697	THEFT OF SERVICE DETECTION SYSTEM, PROOF OF CONCEPT	\$ 776,000	\$ 715,022	\$ 60,978	2/6/2004 12/05	\$ 114,621	\$ 625,400	\$ 625,400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Evaluate if multi-dimensional customer electric usage models can be used to detect theft of service cases.
92748	CALM ANALYSIS DEMONSTRATION FOR IMPROVED REPLEVIN PROCESS	\$ 185,000	\$ 110,000	\$ 75,000	12/6/2007 06/08	N/a	N/a	N/a	\$ 110,000	\$ -	\$ 50,000	\$ -	\$ -	\$ -	\$ -	Con Edison's Customer Services is always striving to improve the quality of its service and efficiency if its operations. Certain Customer Operations processes lend themselves to potential improvements with the application of computer-aided technology. One business area that stands out is the Replevin Law Process that impacts uncollectibles. This business area is a complex operation requiring extensive interaction with Law other company departments. The work is labor and paper intensive and involves the Company directly interfacing with customers. One computer technology that could assist in maximizing the performance of the Replevin Law Process is the methodologies of Computer-Aided Lean Management (CALM) analysis. CALM analysis, with its ability to provide an automated way to track actions, measure performance, and rigorously adjust the actions to improve future performance, has the potential of affecting significant improvements in the Replevin area. This demonstration will determine the effectiveness of CALM analysis to the Replevin business area in Customer Operations
92749	CUSTOMER OPERATIONS R&D TECHNOLOGY PLANNING	\$ 100,000	\$ 60,118	\$ 39,882	11/15/2006 04/07	N/a	N/a	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Conduct Technology Conference with Customer Operations to Identify and develop R&D initiatives that could result in cost reductions, improved operational efficiency, and worker productivity.

DISTRIBUTED ENERGY RESOURCE PROGRAM SERVICES (CERA, ENERGY INSIGHTS, EPRI SOL.)																	
92373	EPRI/NYSERDA/DOE TRAVEL BY ENERGY SERVICES PERSONNEL	\$ 55,000	\$ 64,800	\$ (9,800)	4/6/2006 12/08	N/a	N/a	\$ -	\$ 29,500	\$ -	\$ 25,000	\$ 20,000	\$ 25,000	\$ 25,000	\$ -	Explore and demonstrate new technologies and information access and utilization that would enhance the operation and performance of our electric system and our service to our customers by participating in the CERA and other Distributed Energy Services.	
92380	DEMONSTRATION OF A COMBINED HEAT AND POWER MICROTURBINE AT THE TOWER & CLOCK LIGHTING SYSTEM	\$ 250,000	\$ 148,579	\$ 101,421	1991-01-01 Ongoing			\$ -	\$ -	\$ -	\$ 728	\$ 5,000	\$ 5,000	\$ -	\$ -	Facilitate application of new technologies by supporting employee attendance at industry meetings.	
92603		\$ 120,000	\$ 106,681	\$ 13,319	3/12/2003 12/05			\$ 68,787	\$ 2,204	\$ 2,204	\$ -	\$ (4,400)	\$ -	\$ (4,400)	\$ -	The primary objective of the project is to provide cost-sharing funds with NYSERDA that is required for the installation and technical and economical evaluation a nominal 70 Kw microturbine unit.	
92638	E-SOURCE TECHNOLOGY ASSESSMENT AND ENERGY EFFICIENCY PROGRAM SERVICES	\$ 20,000	\$ 1,252	\$ 18,748	10/17/2007 04/08	N/a	N/a	N/a	\$ -	\$ 1,252	\$ -	\$ 1,252	\$ -	\$ -	\$ -	This is a demonstration project to accelerate the use of LED technology for architectural applications. LED lighting equipment and controls will be installed to test a small portion of the clock and section of the tower as a proof of concept. Team has already done preliminary test to confirm application.	
92743	EPRI ASSESSMENT OF ENERGY EFFICIENT POWER SUPPLIES	\$ 150,000	\$ 25,310	\$ 124,690	11/27/2007 12/09	N/a	N/a	N/a	\$ 25,310	\$ -	\$ 75,000	\$ 50,000	\$ 50,000	\$ -	\$ -	To be competitive and responsive to our customers, we need a source of independent analysis, strategic insights and indepth assessment related to retail energy markets, services and technologies, particularly in the areas of energy efficiency, distributed resources, storage technologies, and other emerging technologies. This appropriation provides funding for access to emerging energy related technologies that can be used by Con Edison's R&D, Energy Services and Energy Efficiency personnel as a basis for technology development, demonstration, and deployment to improve our overall system and operation.	
92754	<b>SUBTOTAL CUSTOMER OPERATIONS PROGRAM</b>	<b>\$ 350,000</b>	<b>\$ 175,000</b>	<b>\$ 175,000</b>	<b>12/19/2007 12/08</b>	<b>N/a</b>	<b>N/a</b>	<b>N/a</b>	<b>\$ 175,000</b>	<b>\$ -</b>	<b>\$ 175,000</b>	<b>\$ -</b>	<b>\$ 175,000</b>	<b>\$ -</b>	<b>\$ -</b>	Con Edison is a participating member of the Electric Power Research Institute (EPRI) Energy Efficiency program. Under this program, Con Edison and EPRI are collaborating on research and development to improve the efficiency and integration of electricity delivery systems and the end-use equipment in homes, offices, and factories. When energy efficiency is augmented with demand response and load management, it is one of the most cost effective means of addressing higher fuel costs, growing load demand, and reducing greenhouse gas emissions. What is needed is a better understanding of how some of the new state of the art technologies, such as the highly efficient 80 PLUS computer power supplies, may fit into the long range solution to Con Edison's objectives for energy saving opportunities.	
		<b>\$ 3,608,000</b>	<b>\$ 2,684,670</b>	<b>\$ 923,330</b>				<b>\$ 87,388</b>	<b>\$ 834,668</b>	<b>\$ 834,668</b>	<b>\$ 658,594</b>	<b>\$ (108,927)</b>	<b>\$ 410,000</b>	<b>\$ (25,522)</b>	<b>\$ 350,000</b>	<b>\$ 125,000</b>	

Footnotes:  
1) N/a means the project was not authorized during that year. The R&D program is a continuous number of rolling projects that are either completed, underway or are conceptual and will start sometime in the future. This is a snapshot of the R&D portfolio at this point in time. It is not inclusive of all prior R&D projects that have been completed nor does it include the conceptual projects that are shown in Exhibit\_(AK-1).  
2) The amount authorized for each program increases everytime a new project is authorized or an on-going project's authorization is supplemented. In the case of authorizations for Institutional projects such as EPRI and CEA, these amounts are up-dated annually based upon the level of funding approved by the Chairman.  
3) This spreadsheet presents our institutional and internal reasearch program area. It does not include our Adminstrative costs. This includes the salaries of the personnel in the R&D department, department operating expenses and the cost of protecting the Company's intellectual properties through the patent process.



## **2008 Project Status Sheets**

# **Electric Research, Development and Demonstration**

Prepared for the Public Service Commission  
by Consolidated Edison Company of New York, Inc.  
4 Irving Place, New York, NY 10003  
April 2008

January, 2008

Cost Segregation Number: 92000

Program Area: Electrical  
Distribution

Title: DEVELOPMENT OF ENGINEERING MODELS BY ASSOCIATING CUSTOMERS AND  
LOAD RESEARCH DATA TO NAIC CODES

Contractor:

Cosponsors:

Project Duration: 02/06/07-- 07/08

R&D Engineer: Lee S.

Project Engineer: PSHENA C.

Objective:

In this effort, we will opulate the CIS (Customer Information System) and load research data with NAICS codes. An NAICS code is a unique identifier to a specific industry and will facilitate in segregating our customers into homogenous groups with similar load patterns.

Benefits:

Develoing accurate distribution models will help us determine accurately how reinforcement dollars should be spent in the secondary distribution system to ensure reliability of supply.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$40,500
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report **x**  
Closed \_

Technical Status:

The NAICS codes have been populated within CIS. The data is currently being analyzed to improved the distribution analysis models. The project will be closed in the next reporting period.

January, 2008

Cost Segregation Number: 92001

Program Area: Electrical  
Distribution

Title: VALIDATION OF ENGINEERING MODELS IN MANHATTAN WITH FIELD MEASUREMENTS - PHASE 0

Contractor:

Cosponsors:

Project Duration: 02/05/07-- 06/08                      R&D Engineer: Lee S.

Project Engineer: SZABADOS R.

Objective:

In this effort, we will evaluate and select the locations for measurements required to validate the engineering models. We will select two locations where the suggested field measurements will be installed in order to determine the feasibility to expand this effort with sufficient data points to validate the engineering model.

Benefits:

An accurate secondary distribution model will help us determine accurately how reinforcement dollars should be spent in the secondary distribution system to ensure reliability of supply.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$8,438
	<u>Budget for the 2008:</u>	\$0

Schedule:    Funding \_    Engineering \_    Procurement \_  
                  Implementation \_    Installation \_    Demo \_    Final Report **x**  
                  Closed \_

Technical Status:

The project will be closed out in the 2nd Qtr. of 2008. The follow-on work is being completed in CSN 92352.

January, 2008

Cost Segregation Number: 92002

Program Area: Electrical  
Distribution

Title: MODEL BUILD FEASIBILITY USING DEW

Contractor:

Cosponsors:

Project Duration: 02/05/07-- 12/08                      R&D Engineer: Lee S.

Project Engineer: CHEBLI E.

**Objective:**

In this effort, EDD will conduct a review of the model data available for the various other boroughs and determine whether there are sufficient similarities.

**Benefits:**

The model review will help us determine whether DEW models in other systems can be readily built at Con Edison. DEW models can provide analysis down to the secondary customer which currently is not available at many of our network distribution models.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$50,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$31,750
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

In this project, we have thus far reviewed the model data in Queens borough for circuit buildin in DEW. We expect to evaluate additional data in 4th Qtr. this year.

January, 2008

Cost Segregation Number: 92003

Program Area: Administration/Industry Group  
Industry Group

Title: EPRI'S DYNAMIC ENERGY MANAGEMENT (ENERGY EFFICIENCY)  
INITIATIVE

Contractor:

Cosponsors:

Project Duration: 02/26/07-- 12/08

R&D Engineer: O'Sullivan R.

Project Engineer: O'SULLIVAN R.

**Objective:**

An assessment of how energy efficiency and demand response can affect demand and energy forecasting as well as transmission and distribution planning and operation including an assessment of methods for calculating the CO2 emission reductions is needed. The analytics is to provide ready -now support with emphasis on providing resources that enable a no-regrets strategy for utilities and regions that are now embracing or reinvigorating energy efficiency and demand response programs.

**Benefits:**

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals surface new research initiatives.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$145,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$132,780
	<b><u>Budget for the 2008:</u></b>	\$270,000

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

This EPRI initiative began in 2007 and is ongoing as part of EPRI's base program in 2008.

January, 2008

**Cost Segregation Number:** 92007**Program Area:** Electrical  
Distribution**Title:** DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE AND MANHOLE  
EVENTS ANALYSIS - PHASE I**Contractor:****Cosponsors:****Project Duration:** 03/01/07-- 06/08**R&D Engineer:** Lee S.**Project Engineer:** VARELA-MALONEY**Objective:**

Con Edison Underground Distribution system consists of approximately 300,000 structures. In 2005, we recorded approximately 230 shock incidents and more than 2,300 manhole events consisting of explosions, fires and smokers. To better design mitigation techniques, we need to identify those factors that are significantly correlated to these events. The ability to identify those structures that are most vulnerable to such events will also help us prioritize and target our spending more effectively. In 2005, Columbia University conducted aPhase 0 study and performed exploratory work on secondary network failure data and the related trouble ticket data. Prototype software was created to extract information from ECS tickets and integrate into a geographic database. Effects of winter weather on secondary network events were analyzed and modeled.

**Benefits:**

Potentially, machine learning can be used to identify factors that are related to manhole and stray voltage events. Better understanding of those factors will help us better design and practice those mitigation techniques that will be most effective.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$390,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$339,250
	<b><u>Budget for the 2008:</u></b>	\$250,000

<b><u>Schedule:</u></b>	Funding _	Engineering _	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report <b>x</b>

**Technical Status:**

This project is complete and will be closed out in 2nd qtr. 2008

January, 2008

Cost Segregation Number: 92015Program Area: Electrical  
CustomersTitle: CURRENT TRANSFORMER DISCONNECT DEVICEContractor:Cosponsors:Project Duration: 03/16/07-- 06/08R&D Engineer: Carbonara J.Project Engineer: GAFFNEY J.Objective:

Disconnecting current transformers ( CT) is a delicate operation with respect to employee safety and the time it takes to perform this function. The reason for disconnection of these transformers is primarily due to customers failure to pay their utility bills. Our employees must reach in to the CT cabinet and remove the bolts that secure the lugs while making sure they don't cross phase or short to ground.

Benefits:

A procedure that is in place already will be enhanced with respect to employee safety and operating efficiency.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$129,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$252,000
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation **x** Demo \_ Final Report \_  
Closed \_

Technical Status:

Completed the construction and delivery of new current transformers ( CT ) disconnect device for Staten Island division. Disconnecting current transformers is a delicate operation with respect to employee safety and the time it takes to perform this function. This new device makes it safer for the employee to perform future disconnects by opening a link on the device. This device also lessens the time required to perform the disconnect which are usually performed under less than perfect circumstances ( ie disconnecting electric service to a customer for non payment ). These devices will be installed in various transformer cabinets and will be monitored for improved safety and ease of disconnect-connect operations.

January, 2008

**Cost Segregation Number:** 92017**Program Area:** Electrical  
Distribution**Title:** PARTIAL DISCHARGE SNIFFER DEVELOPMENT**Contractor:** UTILX - CABLE WISE**Cosponsors:****Project Duration:** 07/16/04-- 12/08**R&D Engineer:** Doherty F.**Project Engineer:** WEN Y.**Objective:**

The feeder cables and splices in our underground network system are of various ages and are subject to a wide array of environmental conditions. There exists no system for determining their remaining useful life. Physical inspection of the visible external attributes of cables and splices is used to determine safe entry protocols, and to manage maintenance and replacement programs. This project will explore the practicality of a hand-held partial discharge detector that will act as a pre-entry sniffer to enhance safety and improve maintenance effectiveness. Cablewise will engineer and develop a bench-top partial discharge sensor and make initial observations of exemplar components and equipment in typical field manholes.

**Benefits:**

Development of the partial discharge sniffer will enhance the safety of our employees and improve the effectiveness of our operations and maintenance.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$50,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$49,218
	<b><u>Budget for the 2008:</u></b>	\$30,000

<b><u>Schedule:</u></b>	Funding _	Engineering _	Procurement _
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

Initial experiments yielded promising results. Follow up experiments in progress.

January, 2008

Cost Segregation Number: 92021

Program Area: Electrical  
Distribution

Title: RELIABILITY ANALYSIS METRICS FOR 3G SYSTEM OF THE FUTURE (SOF)  
DESIGN

Contractor:

Cosponsors:

Project Duration: 03/01/07-- 09/08

R&D Engineer: Lee S.

Project Engineer: ANDERSON J.

Objective:

In this effort, we will conduct a review of the merits of probabilistic reliability approaches suggested to date for use in design oncepts evaluation. If required, alternative approaches or metrics will be developed as part of this project.

Benefits:

This project will help us ensure that 3G SOF design concept evaluation are conducted appropriately.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$19,378
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

A number of probabilistic reliability approaches are currently under evaluation.

January, 2008

Cost Segregation Number: 92027

Program Area: Electrical  
3G System of the Future

Title: 15KV FAULT CURRENT LIMITER (DEVELOP, DESIGN, ASSEMBLE, TEST & DELIVER PROGRAM)

Contractor:

Cosponsors:

Project Duration: 03/15/07-- 12/10

R&D Engineer: Duggan P.

Project Engineer: GHAFURIAN R.

Objective:

Fault current limiting functionality can allow more cost effective design alternatives, and in particular, improve Con Edison's ability to handle continuing increases in demand, and enable flexibility of design for both future substations and replacement and upgrade strategies for existing substations. In response to industry needs more vendors, acting individually and in strategic partnerships are trying to develop new fault current limiter designs. Although our nearest term need is to develop a 15kV, 3000 - 4000 amp device for immediate use, we also need to migrate the most promising device designs to 27 and 34kV for other distribution applications, and as soon as possible, to 138kV and 345kV transmission voltages. Our stringent requirements of high fault current levels, high transient current levels during contingencies and a compact design to support retrofit application in our very space restricted urban substations requires significant further development of the currently available designs.

This RADPAR includes the following tasks:

- identify the most promising, technically achievable 13kV FCL designs,
- quantify the associated costs to develop and test the proposed FCL units that meet most, if not all of our technical requirements,
- select the best FCL designs based on a competitive bidding process (RFI, RFP),
- develop and test one or two 15kV units depending on compliance with our needs, cost and funding requirements,
  
- demonstration of the selected FCL(s) on the distribution system and
- in parallel with the above 15kV development effort, identify the most promising FCL units for future development and migration to higher voltages (34kV, 138kV and 345kV).

Benefits:

By following this type of partnered design process, we hope to accelerate the commercial availability of the technology to mesh with our already committed substation construction program. This new functionality could also be used to support short-term load transfers that could selectively defer otherwise required station up-rates and re-enforcements. Financial risk will be limited by close

January, 2008

**Cost Segregation Number:** 92027

participation and monitoring of the design and development process by Con Edison personnel. We would phase our commitments to vendors via purchase order releases that that have pre-determined technical milestones, specification and test requirements.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$2,250,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$1,877
	<b><u>Budget for the 2008:</u></b>	\$1,126,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Due to a combination of our service area's high load density, paralleled N-2 redundancies and a high percentage of in- and near-city generation, fault currents on the Con Edison System are significantly higher than on many other power systems. Recent refinements in fault calculation methodology have revealed existence of fault currents higher than those indicated by previous calculation methodology. Currently used methods to mitigate higher fault currents, which include series reactors and high impedance transformers have been employed to the extent that they can be used without causing operational problems, excessive losses or stability issues. Breaker fault clearing uprate programs are ongoing, but are very costly, difficult to schedule and in themselves require outages which impact system reliability. Even if all system breakers could be uprated this would not address potential bracing problems for switchgear, buses, transformers and grounding systems that are subjected to the higher mechanical, thermal and magnetic forces caused by these fault currents. Future load increases require the addition of transmission or generation capacity, which only continues to increase fault currents over time. New alternative fault current limiting devices could allow more cost effective designs, and in particular, improve Con Edison's ability to handle continuing increases in demand, and enable flexibility of design for both future substations and replacement and upgrade strategies for existing substations. In response to industry needs more vendors, acting individually and in strategic partnerships are trying to develop new fault current limiter designs. Although our nearest term need is to develop a 15kV, 3000 - 4000 amp device for immediate use, we also need to migrate the most promising device designs to 27 and 34kV for other distribution applications, and as soon as possible, to 138kV and 345kV transmission voltages. Our stringent requirements include: high fault current levels, high transient current levels during contingencies, short recovery times and a compact design to support retrofit application in our very space restricted urban substations.

As of 3/8/2008 Phase 1 Paper study has been completed, and is under evaluation as a contingency piece of project Hydra (75th St.-York Substation Inherently Fault Current Limiting Superconducting Cable DEMO). Two vendors (Silicon Power and SCPower) have provided information on the ability of their individual FCL designs for a 15kV 4000 amp FCL to be available for installation, if needed as

January, 2008

**Cost Segregation Number:** 92027

part of this DEMO in early 2010. Based on the Phase 1 review results (a third vendor, Powell, did not meet schedule needs, and failed to complete the Purchase Order award process). EPRI, DOE and ORNL are participating in the evaluation process along with AMSC (focused on superconducting cable interactions) and Con Edison. If approved by AMSC and DHS one or more of these vendors would be selected to complete design, assembly and testing of this first of a kind 4000 amp device in accordance with the planned construction schedule. If not used in the 75th St.-York DEMO the device would be available for demonstration elsewhere by Con Edison. The 4000 amp rating is required due to the contingency ratings (92MVA) of our typical 63MVA power transformers.

January, 2008

Cost Segregation Number: 92030

Program Area: Electrical  
Transmission / Planning

Title: INVESTIGATION OF THERMO-MECHANICAL BENDING (TMB) FAILURES

Contractor: CABLE CONSULTING INTERNATIONAL

Cosponsors:

Project Duration: 03/22/00-- 05/08                      R&D Engineer: Wong J.

Project Engineer: GHAFURIAN R.

Objective:

To review the cause of recent failures on feeders M51 and 72 and determine if these failures are specific, localized cases or a new TMB failure mode has developed on 345kv feeders.

Benefits:

To enhance the reliability of the transmission system.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$360,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$344,473
	<u>Budget for the 2008:</u>	\$50,000

Schedule:    Funding \_    Engineering     Procurement \_  
                  Implementation \_    Installation \_    Demo \_    Final Report \_  
                  Closed \_

Technical Status:

Due to two failures in summer 2006 for Feeder M51, the vendor Cable Consulting International was requested to perform additional simulation of the thermomechanical behavior. The objective is to extend the current simulation technique developed for 138 kV extruded pipe-type cable to 345 kV paper pipe-type cable systems to address the TMB problem in pipe-type cable, determine the effects of different construction and operating variables on TMB resistance of the cable, and provide sufficient understanding of the problem and data on effects of construction and operating variables to permit determination of probable TMB performance of 345 kV paper pipe-type cable. Refined parameters were added for additional simulation and result are expected in the Spring 2008.

R&D Project Status Report

January, 2008

Cost Segregation Number: 92032

Program Area: Administration/Industry Group  
Administration

Title: SALARIES AND WAGES

Contractor:

Cosponsors:

Project Duration: - - Continuing R&D Engineer: Coppersmith F.

Project Engineer: COPPERSMITH F.

Objective:

To segregate the various operating costs of the R&D Department. The components are:

92032 - Salary & Wages

92034 - Telecommunications, vehicle charges and other departmental expenses.

Benefits:

NA

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$0
	<u>Spent To Date (as of 12/31/2007):</u>	\$55,734,734
	<u>Budget for the 2008:</u>	\$2,043,000

<u>Schedule:</u>	Funding _	Engineering _	Procurement _	
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _	Final Report _
	Closed _			

Technical Status:

Not applicable

R&D Project Status Report

January, 2008

Cost Segregation Number: 92034

Program Area: Administration/Industry Group  
Administration

Title: OTHER EXPENSES

Contractor:

Cosponsors:

Project Duration: - - Continuing R&D Engineer: Coppersmith F.

Project Engineer: COPPERSMITH F.

Objective:

To segregate the various operating costs of the R&D Department. The components are:

92032 - Salary & Wages

92034 - Telecommunications, vehicle charges and other departmental expenses.

Benefits:

NA

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$0
	<u>Spent To Date (as of 12/31/2007):</u>	\$7,833,913
	<u>Budget for the 2008:</u>	\$198,000

<u>Schedule:</u>	Funding _	Engineering _	Procurement _	
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _	Final Report _
	Closed _			

Technical Status:

Not applicable

January, 2008

**Cost Segregation Number:** 92051**Program Area:** Electrical  
Transmission / Planning**Title:** PARTICIPATION IN THE CANADIAN ELECTRICITY ASSOCIATION  
TECHNOLOG**Contractor:** CANADIAN ELECTRICIAN ASSOCIATION**Cosponsors:****Project Duration:** 06/28/00-- 12/08      **R&D Engineer:** Barna A.**Project Engineer:** DUGGAN P.**Objective:**

CEA has been found to be a cost effective mechanism to increase industry contacts, benchmark Con Edison practices and develop new technologies that compliment other company R&D activities. The value of this effort is increasing, since other U.S. utilities, such as AEP, Bonneville Power authority, Central Hudson, Entergy, INEEL, NYPA, NYS Electric & Gas, Northeast Utilities, TVA, United Illuminating Authority and Duke are also starting to participate in this resource.

**Benefits:**

Improved leveraging of R&D expenditures for Ice Storm Mitigation, Distribution Substation Equipment, Power Quality and Distribution Generation.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$500,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$556,836
	<b><u>Budget for the 2008:</u></b>	\$10,000

**Schedule:**    Funding \_    Engineering     Procurement \_  
                   Implementation \_    Installation \_    Demo \_    Final Report \_  
                   Closed \_

**Technical Status:**

Participation in the Canadian Electricity Association (CEA) was previously approved as an initial trial. Based on the value demonstrated to date, as reported by Technical Leads from various Con Edison organizations, this revised project increases the annual authorization to cover technical lead travel and small project participation expenditures (such as the \$3000./project participation charges for 5 projects that have been recommended for approval by Con Edison's Ice Storm Mitigation Interest Group technical lead participants from S&TO Engineering and Transmission Operations). In addition this project extends the authorization for participation, subject to annual approval, for a full 5years.

January, 2008

**Cost Segregation Number:** 92052**Program Area:** Electrical  
Distribution**Title:** REAL-TIME BATTLEFIELD VISIBILITY COCKPIT CONTROL CENTER  
DECISION SUPPORT - PHASE 1**Contractor:** DIGIMEDIA**Cosponsors:****Project Duration:** 03/23/07-- 09/08**R&D Engineer:** Lee S.**Project Engineer:** HOFFMAN P.**Objective:**

In any severe and rapidly developing emergency, defining the problem through multiple detection of anomalies, and the subsequent actions taken to mitigate the situation, requires comprehension using both knowledge from within the operator and analysis of many facets of the electric system design basis and the system's present status. In order for an operator to analyze the situation adequately and be able to act upon it, it is imperative that information be presented in concise operator oriented displays that present the most important information in priority order. This would be analogous to a Heads Up Display (HUD) utilized in battlefield conditions. It presents a highly visible view of what the operator needs to know immediately in order to respond to emerging threats.

**Benefits:**

A "heads-up" display will be used by operators to readily identify escalating problems before they occur, track anomalies as they occur and are repaired, and assist the operator in resolving anomalies during emergencies as well as part of a proactive maintenance plan.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$145,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$41,512
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

Developed prototype of Contingency Analysis and Fault Correlation integrating the data feeds from PQ Node and Relay data and outage information, project is now being developed into a production tool. Currently evaluating and testing virtual desktop and 3D desktop solutions to present the multi-modal of information. The hardware requirements for multi-display systems have been identified. Further analysis of relay data and PQ node and outage information is being performed.

January, 2008

Cost Segregation Number: 92061C08

Program Area: Electrical  
Distribution

Title: 600A SEPARABLE CONNECTORS-INITIAL DATA ACQUISITION AND RANKING

Contractor: COLUMBIA UNIVERSITY

Cosponsors:

Project Duration: 03/27/07-- 02/08

R&D Engineer: Doherty F.

Project Engineer: EICHELE F.

Objective:

On May 5, 2006, a Distribution Splicer received burns while he was splicing primary cable in a disconnect manhole when an "H-type" disconnect failed in that manhole. Detection of precursor conditions could allow repair of incipient conditions before a failure occurs.

Benefits:

This study will explore if precursor conditions of separable connectors failures can be identified before operating failures occur.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$88,088
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

To be closed out in 2Q of 2008

January, 2008

Cost Segregation Number: 92069Program Area: Administration/Industry Group  
Industry GroupTitle: EPRI - ELECTRIC TRANSMISSIONContractor: EPRICosponsors:Project Duration: - - Continuing R&D Engineer: O'Sullivan R.Project Engineer: COPPERSMITH F.Objective:

Membership in EPRI research and information programs provides current information on new electric research initiatives.

Benefits:

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals and surface new research initiatives.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$12,389,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$10,941,378
	<u>Budget for the 2008:</u>	\$1,400,000

<u>Schedule:</u>	Funding _	Engineering _	Procurement _	
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _	Final Report _
	Closed _			

Technical Status:

Funding of EPRI's programs continues in 2008.

January, 2008

**Cost Segregation Number:** 92070**Program Area:** Electrical  
Transmission / Planning**Title:** PARTICIPATION IN EPRI "SUNBURST 2000" PROGRAM RELATED TO  
GEOMAG**Contractor:** EPRI, ELECTRIC RESEARCH INC.**Cosponsors:****Project Duration:** 07/01/00-- 12/10**R&D Engineer:** Duggan P.**Project Engineer:** DUGGAN P.**Objective:**

Participation in the EPRI Sunburst 2000 Network provides direct "real time" access via PC and email messaging to an existing network of sensors monitoring neutral ground currents that are Geomagnetically Induced (GIC) following solar mass ejections. In addition the reports and tools provided, and participation with the Sunburst utility user group will assist System Operations and Engineering to develop practical methods to Mitigate GIC events, which have in the past caused System tripouts and major transformer failures. The EPRI effort includes work in cooperation with NASA, NOAA and international utilities to improve GIC modeling, and provide earlier and more accurate alerts to member utilities.

**Benefits:**

Our participation in the EPRI Sunburst Geomagnetically Induced Current (GIC) monitoring network continues to provide significant benefits, including: Diagnosis of two separate Cap Bank tripouts at East Fishkill Substation, Validation of effectiveness of subsequent Cap Bank protection improvements during later GIC events, Continued effectiveness as a representative indicator of elevated GIC at East Fishkill, and possibly other northern substations; particularly with regard to existing monitoring at Roseton, Following Engineering appropriation and installation of already purchased GIC monitoring systems for Sprainbrook and Goethals, improved direct monitoring of GIC effects in the central and southern end of our System and Supplementary benefits (e.g. power quality monitoring) from the phase harmonic monitoring that the new monitors at Sprainbrook and Goethals will provide. (It should also be noted that earlier geological studies performed by NYSERDA for Con Edison and NYPA previously identified potential for amplified GIC at Goethals due to "ocean effects.")

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$250,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$198,302
	<b><u>Budget for the 2008:</u></b>	\$20,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	x	Installation	_	Demo	_
	Closed	_			Final Report	_

January, 2008

Cost Segregation Number: 92070

Technical Status:

Participation in the Sunburst Network may become even more valuable due to the pending likelihood of interruption and loss of Space Weather information and NOAA alerts from the ACE Satellite. Although it is delayed by 11 hour and after the fact, Sunburst Network may become our only means to determine that the energy from solar mass ejections has strongly coupled and reached earth at a high intensity. Con Edison participated in an EPRI Sunburst Webcast on 11/13/2007 and Presented an overview of NPCC-NYISO-Con Edison GIC Mitigation Procedures.

Under a separate CSN 92260, we are currently awaiting an outage (expected March 2008) to install the first of two Con Edison system GIC Monitors at Goethals. Installation of a second monitor at Sprainbrook will follow

January, 2008

Cost Segregation Number: 92071

Program Area: Administration/Industry Group  
Industry Group

Title: EPRI FUNDING FOR ELECTRIC DISTRIBUTION AND CUSTOMER R&D

Contractor:

Cosponsors:

Project Duration: - - Continuing R&D Engineer: O'Sullivan R.

Project Engineer: COPPERSMITH F.

Objective:

Membership in EPRI research and information programs provides current information on new electric research initiatives.

Benefits:

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals and surface new research initiatives.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$16,050,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$15,957,906
	<u>Budget for the 2008:</u>	\$1,415,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Funding of EPRI's programs continues in 2008.

January, 2008

Cost Segregation Number: 92073Program Area: Electrical  
MeteringTitle: MONITORING DEVICE FOR UNMETERED SERVICESContractor: POWERONE, SENSUS.Cosponsors:Project Duration: 11/16/04-- 12/09R&D Engineer: Lee S.Project Engineer: MAUGERI D.Objective:

To remotely monitor unmetered services using wireless technology.

Benefits:

Increase the revenue of Unmetered Services to the Company by ensuring that all electric consumption is being correctly billed. In addition, there would be an increased customer satisfaction by ensuring that customers' bills are accurate.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$200,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$64,189
	<u>Budget for the 2008:</u>	\$40,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation  Demo \_ Final Report \_  
Closed \_

Technical Status:

Sensus has developed and delivered working prototypes of their submersible meter for unmetered services to the Con Edison Meter Shop. The Meter Shop is currently evaluating those prototypes. In parallel to this effort, several Itron meters that were originally designed for use in Brazil are currently being installed on overhead services for cable TV amplifiers in Westchester. This Itron meter is also proposed to be installed in telephone kiosks. Customer operations are planning to deploy the Itron meter on a wider scale in 2008-2009.

January, 2008

**Cost Segregation Number:** 92078**Program Area:** Electrical  
Customers**Title:** WIRELESS WORK MANAGEMENT SYSTEM FOR FIELD OPERATIONS**Contractor:** ITRON**Cosponsors:****Project Duration:** 12/14/04-- 06/08**R&D Engineer:** Carbonara J.**Project Engineer:** PANNITTI S.**Objective:**

Study current FPET system to determine business needs for a new system. Survey other utilities to assess systems that they are presently using.

**Benefits:**

Provide Customer Representatives with real-time field data allowing them to provide customers with up to date and accurate information with regard to field dispositions. This will lead to a reduction in calls to our phone center. Will also provide for improved overall productivity of our Field Operations support staff.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$145,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$100,043
	<b><u>Budget for the 2008:</u></b>	\$60,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

This project will explore and identify new tools and techniques for mobile data and information transfer that would enhance the operation and performance of our customer field representatives. The new mobile field tool will allow Customer Representatives to access real time field data and provide customers with up to date and accurate information with regard to field dispositions. This will lead to a reduction in calls into our phone center and increase productivity of our Field Operations staff. Customer Service personnel visited several utilities and met with several vendors to assess available field mobile technologies in use or being developed. A specification was developed to facilitate integration of new hardware/software platform with existing customer information systems. A short list of vendors were requested to submit proposals for our evaluation. A final candidate vendor, Itron technologies, was selected as the successful bidder and awarded the contract. Itron developed a system design to integrate and develop their system to work with our customer databases. During the last reporting period we completed the development of the ITRON wireless work management and dispatching system. We conducted solution and

January, 2008

Cost Segregation Number: 92078

integration testing over several months and went "live" with new system in the first half of 2007. We are now using the new system to provide field operators with access to real time field data.

January, 2008

Cost Segregation Number: 92103

Program Area: Electrical  
Distribution

Title: DESIGN AND DEVELOPMENT OF A HYBRID MANHOLE COVER

Contractor: VARIOUS

Cosponsors:

Project Duration: 01/28/05-- 01/08

R&D Engineer: Aromando J.

Project Engineer: MEKHAIEL N.

Objective:

Explore alternative materials, such as composites, for manhole covers as a means to decrease public risk to injury.

Benefits:

This will potentially minimize the public's exposure to electrically live and hot manhole covers.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$320,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$138,279
	<u>Budget for the 2008:</u>	\$100,000

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Structural Science, Ltd. (SS) of the United Kingdom completed their designs as per Engineering's specifications and drawings in 2007 in preparation for load testing and blast testing. In 2007, load tests were performed both in the UK and with Lucius Pitkin; blast tests were completed with EPRI. Tests showed that SS's covers have met Distribution Engineering's non-conductive and load requirements for distribution panels. SS is in the process of also fabricating covers for Steam Distribution which will also undergo tests for loading and thermal insulation in 2008. The SS panels are scheduled for wear testing in 2008 while both Steam and Electric continue with prototype testing from other composite cover vendors such as East Jordan and Energy Products.

January, 2008

Cost Segregation Number: 92112

Program Area: Electrical  
Distribution

Title: DATA VISUALIZATION FOR ENHANCED DECISION MAKING

Contractor:

Cosponsors:

Project Duration: 03/30/07-- 03/08

R&D Engineer: Lee S.

Project Engineer: HAYES C.

Objective:

Existing tools such as excel spreadsheets are limited in its capabilities to analyze data and information from disparate sources. Key insights are often missed when data presentation is limited. A better data visualization tool is needed by engineers and operators to view and identify patterns, trends and anomalies in a single analysis environment. This capability allows the user to incorporate various data sources in order to conduct a broader analysis.

Benefits:

Improved decision making capability will enable more efficient operations and enhanced reliability.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$145,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$68,212
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

Technical Status:

The tool is currently being evaluated and tested on its capabilities.

January, 2008

**Cost Segregation Number:** 92116**Program Area:** Electrical  
Transmission / Planning**Title:** EXPANDED USE OF PHYSICAL OPERATING MARGIN SOFTWARE**Contractor:** EPRI, V&R SOFTWARE**Cosponsors:****Project Duration:** 02/17/05-- 12/08**R&D Engineer:** Duggan P.**Project Engineer:** KOTECHA B.**Objective:**

The project objective is to obtain, develop and apply additional Physical Operating Margin Software modules to Transmission Planning applications, and to increase System Operations' familiarity with the capabilities and functionalities with a view toward possible future use of -RT (real time) versions of this software by System Operations and other company organizations.

**Benefits:**

Improved planning and operational information for Transmission Planning and System Operations.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$200,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$87,044
	<b><u>Budget for the 2008:</u></b>	\$25,000

**Schedule:** Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Con Edison's Transmission Planning has been using V&R Energy Systems Research, Inc.'s (V&R) Physical Operating Margin (POM) software module as a direct input to the Transmission Probability Risk Assessment (PRA) model developed by Transmission Planning. V&R was originally selected by an EPRI-Utility evaluation team based on comparisons with other software applications and companies. A major original advantage of the V&R product was its speed in performing power system modeling and contingency analysis. This has been demonstrated its performance for the Con Edison POM-Transmission PRA model, which is able to perform calculations, which previously took days in hours. Since V&R's original selection they have been working with Con Edison, ATC, BPA, Entergy, Idaho Power, NEISO, KCP&L, Keyspan/LIPA, MISO, ONS, NYPA, Tri-State G&T and TVA to enhance the functionality and performance of not only the POM software module, but of many other modules already in use by many of the utility participants.

January, 2008

Cost Segregation Number: 92119Program Area: Electrical  
DistributionTitle: APPLICATIONS RESEARCH FOR DISTRIBUTION, SUBSTATIONS AND  
TRANSMIContractor:Cosponsors:Project Duration: 02/25/05-- 03/09R&D Engineer: Doherty F.Project Engineer: WEISENFELD N.Objective:

We face a continuing need to provide improved delivery of energy at lower cost. This project will provide an additional venue for collaboration on research, development, prototyping and testing the widening range of technologies and equipment that are becoming possible and/or are being developed by vendors.

Benefits:

Participation in NEETRAC allows us to increase technical and funding leverage and complement ongoing work with EPRI and elsewhere. The baseline projects underway include a broad spectrum of subjects, and by virtue of our participation we expect additional coverage of underground transmission and distribution.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$370,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$279,870
	<u>Budget for the 2008:</u>	\$75,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Since Con Edison joined NEETRAC in January 2005, NEETRAC has proven to be a useful venue for collaboration on research, development, prototyping and testing of technologies and equipment that are important to our operations. It has increased leverage of our funding, including the cable diagnostic focused initiative that, with Federal funding, is resulting in leverage of over 30 to 1. Con Edison's NEETRAC membership agreement provides for priority handling of directed research for members beyond the membership payments. We have engaged it to perform forensic analysis of failed hammerhead separable counters

In 2007, we also received 14 NEETRAC technical reports reflecting research and investigation collaboratively sponsored by its membership.

January, 2008

**Cost Segregation Number:** 92122**Program Area:** Electrical  
Distribution**Title:** DISTRIBUTION CABLE AND SPLICE CENTER FOR EXCELLENCE AT VAN  
NEST**Contractor:****Cosponsors:** EPRI**Project Duration:** 12/14/00-- 12/09**R&D Engineer:** Doherty F.**Project Engineer:** WEISENFELD**Objective:**

Establish a Distribution Cable & Joint Center of Excellence at Van Nest to evaluate distribution assets and develop improved solutions for necessary repair and replacements. Consolidate the cable and joint autopsy programs that were dispersed among various operating groups. Develop databases and analyze condition assessment techniques and data-mine the databases to optimize the future management of distribution cable system operations, maintenance and replacement. Enhance inter-utility collaboration cable distribution and splices.

**Benefits:**

Optimization of cable life, establishment of best practices, reduction of outages, type testing of new cable designs to provide replacement options, consolidation and more effective evaluation of failure analysis data, better prediction of the life cycles of cables and splices, increased knowledge base, and better training of personnel thereby expanding in-house expertise.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$2,400,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$1,588,027
	<b><u>Budget for the 2008:</u></b>	\$100,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	<input checked="" type="checkbox"/>
	Closed	_			Final Report	_

**Technical Status:**

The Cable and Splice Center for Excellence completed its fourth full year of service. Collaboration continues with First Energy PG&E, EXELON, PSE&G, Detroit Edison and TXU as members of the EPRI Cable Testing Network (ECTN).

The Cable Center completed 20 distribution cable system failure analysis and comprehensive failure diagnostic reports for ECTN members. Other deliverables include a DVD on cable and splice failure investigation and a three-day course in distribution power cables.

January, 2008

Cost Segregation Number: 92135

Program Area: Electrical  
Transmission / Planning

Title: SOLID STATE FAULT CURRENT LIMITERS

Contractor: PPECO

Cosponsors: EPRI, ALLEGANY PWR, NE ISO

Project Duration: 01/12/01-- 12/12                      R&D Engineer: Duggan P.

Project Engineer: ISECKE J.

Objective:

Based on benchmarking with many of the densest urban load centers around the world, fault currents on the Con Edison system are among the highest in the world. This is primarily due to the widespread high-rise architecture resulting in very high load densities within New York City.

In order to cope with these high fault currents a number of design strategies have already been incorporated into our standard design, including continuing breaker upgrade programs on both the transmission and distribution systems, the use of high impedance transformers in our area stations, impedance grounding of transformers and generators and selective application of high impedance series reactors.

Increasing fault currents are a continuing problem that remains extremely difficult to deal with due to the following reasons:

- Faults may occur at any location, requiring system wide programmatic uprate programs,
- Con Edison's significantly higher fault currents in some cases require first-of-a-kind equipment development,
- Post-Deregulation uncertainties in timing and location of new developer generation and transmission projects,
- Generation developers tend to choose interconnection locations near fuel sources versus those best suited to power system needs,
- Load growth remains high, requiring additional transmission or generation capacity, which in turn increases fault currents,
- Substantially higher load growth in selected areas for business and residential economic development must also be accommodated,
- Significant future potential exists for shifts in energy uses from conventional fuels to electricity, and for new uses of electricity to reduce carbon footprint and emissions and for health benefits and
- While energy efficiency may reduce the rate of current electric demand increases, it may be overwhelmed projected increases in residential electronics and communication use, or the potential future shifts to electricity as a preferred power source.
- Increased load demand causes the need for capacity increases, which, in turn, increase fault currents
- In addition efforts to reduce transmission congestion and provide additional transmission capacity to support market needs and energy

January, 2008

**Cost Segregation Number:** 92135

security may further increase fault currents

Impacts of unmitigated increasing fault currents include:

- the need to continue and potentially repeat breaker uprate programs in future years on the Con Edison system, which will be ultimately limited in effectiveness by switchgear bracing issues, physical fit of uprated breakers within existing switchgear or on existing foundations, and the cost, outage and reliability impacts of resulting increases in required work,
- potentially damaging increasing magnetic, thermal and mechanical forces whenever fault currents pass through nearby electrical equipment and
- ancillary impacts on intensity/severity of equipment damage resulting from faults and grounding system integrity for equipment and personnel protection and

**Benefits:**

Quantitative benefits from fault current limiters would include reductions in ongoing costs for both transmission and distribution circuit breaker uprate programs and facilitation of asset utilization improvements and reduced equipment and real estate needs for new substations and future substation life extension/replacements. Qualitative benefits include accommodation of load growth and associated capacity increases, reduction of "through fault" stresses on all power system equipment and potentially resulting reductions in costs associated with equipment failures that could result from these stresses.

Con Edison's ongoing fault current limiter development efforts is highly leveraged through proactive engagement, cooperation and co funding with many utility industry, superconductivity community and government stakeholders.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$4,000,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$2,036,897
	<b><u>Budget for the 2008:</u></b>	\$375,000

<b><u>Schedule:</u></b>	Funding _	Engineering _	Procurement _
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

With Funding from Con Edison, EPRI and other utilities, Powell factory and KEMA testing successfully demonstrated solid state fault current limiting (SSCL) functionality at full 15kV 1200 amp ratings. Powell subsequently determined that their first generation design had potential for heat dissipation problems at the 4000 amp higher current rating and could not effectively be migrated to 34kV based on physical size concerns.

EPRI, Silicon Power and EPRI are developing a second generation SSCL design that makes use of advanced power electronics, including the use of SuperGTOs (SGTOs) and Silicon Power's advanced design and "thin pack" packaging and heat dissipation techniques. Silicon Power's SGTO power electronics device has received a 2007 R&D 100 Award from R&D Magazine. Currently Silicon Power is pursuing at

January, 2008

**Cost Segregation Number:** 92135

least three related projects with their SSCL design:

- DOE funded 69kV 1200amp SSCL with EPRI and Con Edison under this CSN 92135
- SCE/CEC funded demonstration of a 15kV 1200 amp SSCL and
- DHS-AMSC-Con Edison (as a subcontractor) funded Standalone 15kV 4000amp FCL under project Hydra (CSN 92027)

SCPower is also working on an alternative design Superconducting fault Current Controller (SFCC) for this same Standalone 15kV 4000amp FCL under project Hydra (CSN 92027)

Con Edison is also continuing its ongoing support of Superpower's Technical advisory Board (TAB) for their Matrix Fault Current Limiter (MFCL) and is actively participating on two NEEETRAC Work Groups focused on SuperPower MFCL design reviews and SCSuper SFCC test protocols, respectively.

DOE has also funded 3 138kV Superconducting FCL designs by AMSC, SuperPower (Con Edison is a minor funder through EPRI) and SCSuper with Con Edison as a supporting utility partner.

Con Edison is the Utility Chair of EPRI's Superconductivity Task force, the Secretary of the Coalition for Commercial Application of Superconductors (CCAS), a participant in EPRI's Management of Fault Current program and Con Edison initiated and is a technical sponsor of an ongoing EPRI funded Florida State Center for Advanced Power Systems Report comparing all fault current management alternatives including conventional methods like series reactors, as well as both superconducting and non-superconducting fault current limiters.

In addition Con Edison endorsed the University of Arkansas' DOD funded first-of-a-kind Silicon Carbide (SiC) Fault Current Limiter, and has agreed in principle to co-fund along with EPRI and Silicon Power a pending second DOD funded project to develop and quantify the performance benefits of a hybrid SiC SGTO. It is anticipated that this materials change could potentially be of benefit not only to SSCLs, but to HVDC and FACTS devices as well.

January, 2008

Cost Segregation Number: 92137

Program Area: Electrical  
Substations

Title: VIDEO SCADA TEST BED FOR INFRASTRUCTURE SECURITY

Contractor: URBAN UTILITY CENTER, MOTOROLA, EMZA, OTHERS

Cosponsors:

Project Duration: 03/25/05-- 12/09

R&D Engineer: Duggan P.

Project Engineer: GRASSI D.

Objective:

The increased concern for external threats to Con Edison's infrastructures in the wake of 9/11 dictates that, we explore the expanded use of tools that could provide more cost effective improvements in monitoring and responding to potential threats to the physical security of the electric, gas and steam infrastructures. Video surveillance and intrusion detection technologies, which currently exist have limitations in cost, effectiveness under various conditions, discrimination of false indications, requirements for communication infrastructure and bandwidth and their ability to provide effective monitoring of distributed infrastructure such as transmission line Rights of Way that inhibit their effective use and wider deployment throughout all Con Edison's facilities.

Benefits:

Implementation of a "test bed" to evaluate various hardware, surveillance methods, signal and image handling and processing, software, alert discrimination and filtering, information display hierarchies and techniques and other configurations and architectures for specific typical security monitoring techniques, configurations and architectures will permit ongoing evaluations of existing and new technologies, and the identification of gaps and needs to support more effective future security surveillance. It is intended that this test bed will explore both more effective and economical use of high resolution surveillance systems, and potential surveillance uses of low cost camera technologies that are currently having rapid increases in commercial deployment for non-surveillance uses. The "test bed" will also explore alternatives for more economical and reduced bandwidth transmission of Video SCADA, or more precisely Virtual (motion jpeg) Video SCADA, data by various means and network interface technologies to allow easy dissemination of Video SCADA information across the corporate network without excessive burden or unacceptable impacts on other network functions. Additionally, the "test bed" will explore ways to reduce costs, improve effectiveness and thereby improve the scalability of security monitoring systems for deployment in a wider range of non-traditional applications, such as transmission Right-of-Way security monitoring.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$475,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$275,709
	<u>Budget for the 2008:</u>	\$75,000

January, 2008

Cost Segregation Number: 92137Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_Technical Status:

As part of the Video SCADA, or more precisely Virtual (motion jpeg) Video SCADA Test Bed, evaluations of developing commercial software enhancements that provides event interpretations and alerts from multiple displays and a method of electronically tracking persons or packages left behind from existing digital video security displays has been completed, and an Active Eye DVR upgrade was installed. Any new enhancements proposed by vendors of interest to Corporate Security would also be evaluated in the future.

Also, wireless surveillance cameras similar to units being deployed by NYPD were successfully installed at Millwood and East River.

A separate prototype was completed for a fully wireless solar and wind powered "smart camera" version with much lower power requirements, improved performance and additional functionalities. Efforts are now continuing on site and application selection for a field demonstration of the "smart camera".

In addition to facilitate new equipment trial use we have installed a "test bed" at Corporate Security's Van Nest location.

The test bed will allow routine field checks of new commercial equipment before remote deployment and trial evaluation of devices and enhancements being developed as research and development. The test bed will also serve as a uniquely useful location for testing new methods to deal with volume vehicle and pedestrian traffic, so typical of urban substations. The test bed is immediately adjacent to a new rooftop parking facility that is planned for a nightclub located on the far side of the roof. Remote station security in more rural and open locations typically tries to identify any infrequent traffic that approaches site fences and gates. Urban security is in many ways much more challenging in that it must distinguish potential threats hidden within much higher volume flows of vehicle and pedestrian traffic in much closer proximities to the sites being protected.

Some of the security enhancements that have been evaluated under this project have included:

- Active Eye is a software enhancement for Integral Digital Video Recorders we currently have through out the company, which provides event interpretations and alerts from multiple displays and a method of electronically tracking persons or packages left behind from existing digital video security displays and
- A new low cost multi-function wireless EMZA camera system that, if successful, would support the wider deployments planned for Video SCADA is currently being demonstrated in this test bed.

January, 2008

**Cost Segregation Number:** 92141**Program Area:** Electrical  
Distribution**Title:** CERA NORTH AMERICAN ELECTRIC POWER ADVISORY SERVICES**Contractor:****Cosponsors:****Project Duration:** 04/05/07-- 03/10**R&D Engineer:** Carbonara J.**Project Engineer:** FROST T.**Objective:**

To be competitive and responsive to our customers, we need a source of independent analysis, strategic insights and in-depth assessment related to energy markets, services and technologies, particularly in the areas of distribution system management, distributed generation, storage technologies, and other emerging technologies. This appropriation provides funding for multi year access to the Cambridge Energy Research Association (CERA) North American Electric Power Advisory Services. This advisory services includes emerging generation related technologies (fuel cell, microturbine, advanced batteries, etc) that can be used by Corporate Planning and R&D as a basis for development and demonstration to improve our overall system and operation.

**Benefits:**

CERA North American Electric Power Advisory Service will allow company personnel to gain access to a source of independent analysis, strategic insights and in-depth assessments related to retail distributed energy markets, services and technologies.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$84,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$25,741
	<b><u>Budget for the 2008:</u></b>	\$29,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Corporate Planning and R&D personell had access to the CERA's North American Electric Power Advisory Services which provided information relevant to emerging technologies e.g. fuel cells, microturbines, storage equipment to allow better planning and demonstration of technologies for improved system reliability and operation.

January, 2008

Cost Segregation Number: 92159Program Area: Electrical  
DistributionTitle: FEEDER TRACING CURRENT REMOTE SENSING DEVELOPMENT AND  
DEMONSTRATIONContractor:Cosponsors:Project Duration: 04/20/05-- 12/08R&D Engineer: Doherty F.Project Engineer: SIMON D.Objective:

Feeder cables and splices in our underground network system are of various ages and are subject to a wide array of environmental conditions. Occasionally, the condition of a component in a manhole requires that it be classified as a D fault, and access to the structure is restricted. In order to make repairs the involved feeder is taken out of service. However, positive identification of the involved feeder is required, and until that identification is made there exists the possibility that the component is not on the expected feeder, but is on another one and is therefore still energized. This project will design and build several wireless remote tracing current pick-up coils and associated receivers and explore the feasibility of their use on our system.

Benefits:

The Con Edison distribution system is comprised of more than 80,000 electrical manholes in which historically about 300 per year are involved in D faults. Development and deployment of this wireless feeder tracing current pick-up coil accessory would improve the safety of our employees and enhance service to our customers by reducing the risk of outages.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$225,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$161,825
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

Technical Status:

A vendor iteratively designed and built the tracing current detection system. The units are being used in several operating regions prior to systemwide use.

January, 2008

Cost Segregation Number: 92168Program Area: Electrical  
SubstationsTitle: ADVANCED BACKUP POWER FOR SUBSTATION AUXILIARIESContractor: PLUG POWER, PREMIUM POWER, CURFCosponsors:Project Duration: 04/26/05-- 12/08R&D Engineer: Carbonara J.Project Engineer: GAUGHAN J.Objective:

Evaluate and demonstrate new technologies such as PEM fuel cell based backup power supply for station battery that could enhance the operation and performance of our station batteries during extended outages.

Benefits:

A fuel cell based backup power supply for supporting station battery capacity potentially offers better performance by providing longer backup time, longer life, and better operation at extreme temperatures. The fuel cell provides better reliability since it is less prone to sudden failure and can be monitored for degradation. Also, reduced maintenance and longer life could result in reduced lifecycle costs.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$145,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$75,621
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

This project will evaluate several equipment alternatives for backup power to substation batteries. The current equipment under evaluation include PEM Fuel Cells and Zinc Bromide Flow batteries. An equipment test stand was set up at the Van Nest Maintenance Facility. The equipment was delivered and a contract was issued to Cooper Union Research Foundation (CURF) to act as an independent tester. The first equipment to undergo testing is the Plug Power Gencore 5kw PEM fuel cell. The equipment was tested to verify its performance specification and to determine its operation during transient conditions. CURF issued the test results in a report issued to Con Edison. An engineering design effort was initiated for the purpose of placing the unit at our Ramapo Substation to supply backup power to the batteries. However, Central Engineering decided not to proceed with this installation and recommended looking at another suitable location. Also, the NYC Department of Buildings is now requiring a MEA certification for this type of equipment if the intended placement is in NYC sites. The equipment that we have on

January, 2008

Cost Segregation Number: 92168

hand is not MEA certified. Until we find a suitable site outside the NYC or vendors offer equipment that is MEA compliant we are placing this project on hold. Zinc Bromide Flow Battery. This testing is scheduled to take place during the next reporting period.

January, 2008

Cost Segregation Number: 92169

Program Area: Electrical  
Transmission / Planning

Title: ADVANCED LEAK DETECTION SYSTEM

Contractor: INVENSYS

Cosponsors: EPRI

Project Duration: 05/09/05-- 08/08

R&D Engineer: Wong J.

Project Engineer: GHOSH D.

Objective:

To develop and demonstrate an advanced leak detection system that is based on various network features (such as network topology, cooling segment length, segment pressure drops, valve layout, valve status, dielectric fluid temperature and pressure).

Benefits:

The main benefit of the study is reliability enhancement of our transmission system by providing a more accurate and faster leak detection method for slow circulated feeders and reduction in the operation and maintenance cost associated with leak detection.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$361,880
	<u>Spent To Date (as of 12/31/2007):</u>	\$207,825
	<u>Budget for the 2008:</u>	\$50,000

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _		
	Implementation _	Installation _	Demo _	Final Report _	
	Closed _				

Technical Status:

We had completed the site sensitivity report and are currently working on site equipment modeling analysis, EPRI milestone 1. Milestone 1 had been completed on March 30th 2006. We are currently working on retrofit flow sensors in the W19th St substation pump house. We have scheduled a W19th St substation pumping plant flow meter upgrade and the completion date for project is expected to be August 30th, 2008.

January, 2008

Cost Segregation Number: 92176Program Area: Electrical  
SubstationsTitle: CEA LIFE CYCLE MANAGEMENT SUBSTATION EQUIPMENT AND APPARATUS  
INContractor: CANADIAN ELECTRICITY ASSOCIATIONCosponsors:Project Duration: 04/10/01-- 06/08      R&D Engineer: Barna A.Project Engineer: CHU D.Objective:

Develop technologies which extend the life of substation equipment.

Benefits:

Better leveraging of R&amp;D expenditures in the area of substation equipment life extension.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$115,418
	<u>Budget for the 2008:</u>	\$25,000

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _	
	Implementation _	Installation _	Demo _	Final Report _
	Closed _			

Technical Status:

UCONN continues to investigate the phenomena which are clearly relevant to the decomposition of cable jacket/dielectric which leads to manhole explosions by using thermo gravimetric analysis (TGA) and a residual gas analyzer (RGA), to study the rate of gas generation and the gas composition which results from anaerobic and aerobic thermal decomposition of the cable jacket/dielectric.

In the latest update UCONN discusses the thermal decomposition of cable insulation in a confined space, which simulates the duct environment based on measurements using TGA and an RGA configured to sample from atmospheric pressure.

Through the TGA and RGA experiment UCONN has gained an understanding of the thermal decomposition characteristics for secondary cable cross sections (jacket plus dielectric)

UCONN has been able to quantify the gas composition rate and rate of generation, as a function of temperature.

January, 2008

**Cost Segregation Number:** 92198**Program Area:** Electrical  
Transmission / Planning**Title:** RELAY PROTECTION AUTOMATED FAULT ANALYSIS**Contractor:** GRID SENTINEL, ADVANCED VISUAL SYSTEM**Cosponsors:****Project Duration:** 10/24/04-- 04/08**R&D Engineer:** Wong J.**Project Engineer:** RAMLACHAN R.**Objective:**

To develop a web-based real time automated system fault analysis system. Based on event driven or time schedule, the system will track DFR (Digital Fault Recorder) data and automatically generate necessary analysis report and post the result on the web within the required time frame accordingly.

**Benefits:**

This will provide the operators with immediate fault analysis, resulting in rapid system restoration. The main benefit is improved reliability of the transmission system.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$100,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$90,927
	<b><u>Budget for the 2008:</u></b>	\$100,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

Demo had been completed on linking system operation EMS with the web fault analysis program. This was automated to allow the System Operation Bulk Power Control Room to view the result of the fault analysis program within minutes of a feeder trip. Due to recent failures in Feeder M51, the vendor has added modifications to include series reactors which allowed monitoring of feeder M51 and M52 for summer of 2007. Schedule completion date of this project is August 30th 2007. The project should be closed out by April 2008.

January, 2008

Cost Segregation Number: 92211Program Area: Electrical  
CustomersTitle: SCORING PROJECTContractor: EXPERIANCosponsors:Project Duration: 08/09/05-- 06/08R&D Engineer: Carbonara J.Project Engineer: DUGGAN J.Objective:

The main objective of this project is to revamp the entire credit flow & strategies while at the same time reducing cost associated with this process along with helping the Company increase revenue by reducing our UB loss. To create a blended score of customer's behavior with the utility and that of a credit bureau that will predict future payment and losses on customer accounts.

Benefits:

Potential benefits from improved risk analysis are sizable and would help lower overall collection costs as follows:

- 1) Improve decision-making process during credit flow.
- 2) Reduce operating costs.
- 3) Increase customer satisfaction.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$100,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$189,247
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

The purpose of this project is to investigate new techniques and tools for reducing collection costs & increasing revenue. Although scoring has been done at other utilities, no one has developed a blended score of internal factors and that of a credit bureau. This will allow us to measure the true credit risk of a customer. Working with Experian we set up a blended score of customer's behavior with the utility and that of Experian credit bureau that will predict future payment and losses on customer accounts. Based on the scoring modeling we can tailor our strategies to minimize our uncollectable billing loss. We will track our performance using the new tools to determine the effectiveness of our revised operations. During the past year we have been able to break down our residential portfolio into 4 separate 'Risk of Default' groups depending on the payment habits and other credit indices specific to Con Edison using the scoring model. Specific credit strategies for each category were tested and tracked for the period of January 2007 to March 2007. A follow up meeting was held with the vendor in Mid April to review

January, 2008

Cost Segregation Number: 92211

the results for each strategy. There were good performance results between the credit strategy for the selected category. We will continue to track the performance until mid year 2008.

January, 2008

**Cost Segregation Number:** 92223C07**Program Area:** Electrical  
Distribution**Title:** DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE AND MANHOLE  
EVENTS ANALYSIS - PHASE 0**Contractor:** COLUMBIA UNIVERSITY**Cosponsors:****Project Duration:** 08/18/05-- 07/07**R&D Engineer:** Lee S.**Project Engineer:** CHOE W.**Objective:**

Develop software to calculate top oil and hot spot temperatures of individual network transformers based on historical RMS load data and present this information to operating people for quick response during contingencies.

**Benefits:**

The model and information delivery software for the accurate operating thresholds of top oil and hot spot temperature will allow more effective deployment of operating resources during contingencies.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$280,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$207,814
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	<input checked="" type="checkbox"/>				
	Final Report					

**Technical Status:**

We have built a software prototype for extracting information from the unstructured remarks field of ECS tickets. The current system can extract structure types, structure numbers, cable types, cable lengths, M&S plate codes, feeder codes, and duplicate ticket information from the remarks field. It can also infer missing M&S plate information from the extracted structures or from GIS coordinates. We have built a predictive model of daily secondary failure counts using only weather information as predictive variables. This goes beyond our previous model in the following ways: (1) it works at a finer temporal resolution, with daily predictions instead of weekly predictions; (2) it takes climate information into account. However, unlike the previous model, the weather-based model gives no indication of failure location yet. We're in the process of investigating spatial patterns in the occurrences of outages coinciding with snow storms and other Winter weather.

This project is complete and was closed out. The final report is on file.

January, 2008

Cost Segregation Number: 92224Program Area: Electrical  
Transmission / PlanningTitle: ADVANCED FLUORONATED HYDROCARBON TRACER ANALYZER SYSTEMContractor: WASSON - ECECosponsors:Project Duration: 06/15/01-- 04/08R&D Engineer: Wong J.Project Engineer: KEELAN P.Objective:

Design a fully electronic control GC using a commercially available column and still detecting PFT within the 2 minute retention time.

Benefits:

This will greatly substain the leak locating effort. The current leak locating GC employs special custom made GLOT column. This will reduce the loss of dielectric fluid loss into the environment and significant reduction in maintenance cost..

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$159,756
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Completed design and development of a gas chromatography (GC) for detection of PFT tracer along underground transmission cabling systems. The new GC is capable of isolating various halogen isomers, and systems, all commercially available parts including the column. The new GC delivers samples at a faster rate, and will be able to establish a history database for underground feeders. The front end concentrator that is being used for this project will be used for the READ device to detect PFT. The GC was delivered on April 2007, and retrofit the PFT van was completed on May 2007. The project is scheduled for close out by April 2008.

January, 2008

Cost Segregation Number: 92230

Program Area: Electrical  
Distribution

Title: DISTRIBUTION FAULT ANTICIPATOR

Contractor: TEXAS A&M UNIVERSITY

Cosponsors:

Project Duration: 06/27/01-- 12/08

R&D Engineer: Doherty F.

Project Engineer: YIP N.

Objective:

Incipient faults ( e.g., tree limb contacting overhead primary, damaged or contaminated pole-top insulators, arrestors, etc. ) on overhead feeders are difficult to detect. We seek a device to monitor feeders and alarm for events that are too small to cause a voltage dip noticeable by customers, trip a breaker, or blow a fuse. Such events are the precursors to permanent faults and customer interruptions.

Benefits:

The Distribution Fault Anticipator can provide:

1. Indication of general circuit health
2. Relative performance of circuits and maintenance prioritization.
3. Indication of tree encroachment along a circuit.
4. Information on power quality events on the circuit.

This device would allow condition-based maintenance to replace time-based maintenance, thereby reducing costs while sustaining a high level of service quality.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$287,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$213,902
	<u>Budget for the 2008:</u>	\$25,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo **x** Final Report \_  
Closed \_

Technical Status:

Two devices are in place in Staten Island. Although there have been issues with hardware and with data gathering, data is being archived and evaluated for association with events on the distribution system towards developing a library of signatures to identify precursors of future faults.

January, 2008

**Cost Segregation Number:** 92240**Program Area:** Electrical  
Substations**Title:** TRANSFORMER LOAD TAP CHANGER CONTROLS RETROFIT**Contractor:** ADVANTECH**Cosponsors:****Project Duration:** 07/11/01-- 06/08**R&D Engineer:** Barna A.**Project Engineer:** ALFIERI M.**Objective:**

Investigate the technical and economic feasibility of converting or replacing all or parts of existing LTC control schemes with solid state circuitry and position sensors. Develop a conceptual approach and design.

The average age of Con Edison's LTC equipped power transformers exceeds 25 years and, as this equipment has aged, the need for maintenance of the controls has increased. Over the last two years, LTC "hang up's" due to control problems have averaged 18 per year and account for 25% of all Out on Emergency forced outages for transmission substation equipment.

This project will investigate the technical and economic feasibility of converting or replacing all or parts of existing LTC control schemes with solid-state circuitry and position sensors. A conceptual approach and design will be developed.

**Benefits:**

Replacement of the old electro-mechanical LTC controls with solid state circuitry will reduce operating and maintenance costs required to keep the transformers operating within specification. Incidences of tap changer "hang-up" and "run-away" will be decreased and transformer availability and reliability improved. Forced outages will be reduced and the operating life of the transformer may be extended.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$100,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$38,076
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The project will be closed out by the end of the second quarter of 2008.

January, 2008

**Cost Segregation Number:** 92242**Program Area:** Electrical  
Transmission / Planning**Title:** DEVELOPMENT OF NEW TECHNIQUE FOR COMMISSIONING TEST OF  
TRANSMIS**Contractor:****Cosponsors:****Project Duration:** 08/24/05-- 10/08**R&D Engineer:** Wong J.**Project Engineer:** ROJOWSKY W.**Objective:**

There is a need for a new technique to identify and locate a joining before it fails and prior to it being fully energized and placed in service.

**Benefits:**

Potential benefits include:

- Improve overall transmission system reliability
- Increase customer satisfaction

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$315,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$201,524
	<b><u>Budget for the 2008:</u></b>	\$50,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

We had applied the new commissioning method for Cedar St to Washington St 138 kV XLPE feeder, and the Dunwoodie to Rockview 138 kV XLPE feeders. Additional scope is set for the new commissioning test for Parkview to Mott Heaven 138 kV XLPE feeders which is scheduled for completion by May 2008

January, 2008

Cost Segregation Number: 92256C08

Program Area: Electrical  
Distribution

Title: DEADLINE PHASE IDENTIFICATION FOR MV CABLES

Contractor: POWER SYSTEMS INTEGRITY, INC. (PSI)

Cosponsors:

Project Duration: 06/22/05-- 06/08

R&D Engineer: Barna A.

Project Engineer: SUOZZO A.

Objective:

To develop, design, and demonstrate a new tool to allow local identification of phases on dead feeder cable. Engage PSI to further develop this concept. PSI will design and test a prototype for a commercial unit, which will be tested on our distribution system.

Benefits:

This tool will improve overall distribution system reliability by providing a tool that will allow faster processing of feeders that require re-identification. It will also reduce operating and maintenance costs by reducing stand-by crew time.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$130,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$126,163
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	<input checked="" type="checkbox"/>			Final Report	_

Technical Status:

A purchase order was issued to PSI in July 2006 for the design, development, and testing of an advanced cable phase ID system for medium voltage cables. The vendor has initiated the system construction phase, which will deliver one communicating receiver unit and two communicating transmitter units. The vendor is currently performing tests on Con Edison cables to determine frequency response of the injected PLC signal.

This project to be closed out by 2Q of 2008

January, 2008

Cost Segregation Number: 92260

Program Area: Electrical  
Distribution

Title: EPRI SUNBURST NETWORK GIC MONITORS (SPRAINBROOK & GOETHALS)

Contractor:

Cosponsors:

Project Duration: 04/09/07-- 12/09

R&D Engineer: Duggan P.

Project Engineer: KOHN T.

Objective:

Enhancement of EPRI Sunburst participation in a network of Geomagnetically Induced Current monitoring that ground currents induced by sunspot activity at selected substation transformers through installation of Con Edison specific GIC monitoring at SprainBrook and Goethals within the Con Edison system

Benefits:

Sensitivity to Solar Mass Ejection initiated Gemagnetically Induced Currents (GIC) has increased due to increased reliance on voltage support, and increased power flows due to de-regulation. In addition to EPRI (Sunburst 2000) participation, specific Con Edison sensitive equipment & locations need to be identified, monitoring sites established, and better modeling and mitigating techniques need to be developed. Con Edison is currently planning to install two monitoring sites at Sprainbrook and Goethals. The EPRI Sunburst Real Time and Historical Monitoring System continues to provide email alerts and WEB access to GIC data to alert personnel to GIC levels in excess of 10 amps at adjacent sites (giving advance warning of potential impacts on the Con Edison System). Two previous Cap Bank trips at East Fishkill strongly correlated with a simultaneous GIC spike seen at the Sunburst networks Roseton monitoring site, and a number of transformer failures during an earlier solar cycle were suspected of being GIC related. Con Edison System Operations when directed by the NY ISO has procedures in place to enter into a GIC Watch similar to our Storm Watch.

Site monitoring directly within the Con Edison System will improve our Con Edison System specific knowledge of GIC effects that can cause transformer failures and/or trip outs of essential voltage support provided by capacitor banks ( Two capacitor bank trips at East Fishkill have been directly attributable to GIC events, and GIC is a suspected contributor to a number of past Con Edison transformer failures). The three nearest GIC monitoring sites existing in the EPRI Sunburst network are north of us within the Central Hudson service area. Sprainbrook and Goethals will provide improved monitoring at both the upper and southern ends of our System, and will give more direct indication of possible increased GIC susceptibility due to ocean effects that were postulated in a previous geological study of potential for GIC within the Con Edison System. Participation in the EPRI Sunburst 2000 Network provides direct real time access via PC and email messaging to an existing

January, 2008

**Cost Segregation Number:** 92260

network of sensors monitoring neutral ground currents that are Geomagnetically Induced (GIC) following solar mass ejections. In addition the reports and tools provided, and participation with the Sunburst utility user group will assist System Operations and Engineering to develop practical methods to Mitigate GIC events, which have in the past caused System tripouts and major transformer failures. The EPRI effort includes work in cooperation with NASA, NOAA and international utilities to improve GIC modeling, and provide earlier and more accurate alerts to member utilities.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$200,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$22,230
	<b><u>Budget for the 2008:</u></b>	\$60,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Monitoring equipment for the addition of Sprainbrook and Goethals onto the EPRI Sunburst network has been delivered to the field, and we are awaiting outages (Goethals outage expected March 2008, Sprainbrook to follow) to complete monitor installations.

January, 2008

Cost Segregation Number: 92261Program Area: Electrical  
Transmission / PlanningTitle: TRANSMISSION FEEDER INFRASTRUCTURE INFORMATION LINKING SYSTEMContractor:Cosponsors:Project Duration: 09/26/05-- 06/08R&D Engineer: Carbonara J.Project Engineer: SMALLEY D.Objective:

Explore and demonstrate new tools and techniques for data and information access and utilization that would enhance the operation and performance of our Transmission Engineering, Operations and Design groups.

Benefits:

Significantly reduce the time required to locate necessary documents and data from hours and days to just a few mouse clicks.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$169,468
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Information describing the electric transmission feeder infrastructure at Con Edison is located in a wide range of formats (some digital and some paper and microfilm) and systems within the company. Accesses in a simple graphic form for Con Edison employees and vendors who need the information is difficult, time consuming and costly. The basic information required for users interested in the electric transmission feeders is the AutoCAD composite feeder maps, the AutoCAD feeder key sheets and the related scanned sub surface drawings. An earlier RADPAR provided funding to gather and link all such documents for Manhattan (90 feeders) and to provide an automated address location finder capability. Con Edison Operations more recently provided funding for this capability to be extended to all of the remaining service area including Queens, Bronx, Brooklyn, Staten Island and Westchester.

With the basic framework in place for electric transmission feeders, additional information about all of the remaining types of infrastructure in the system was implemented during 2005 which was the subject of this Radpar and included informational items such as:

1. Manholes/Cable Splices
2. SubStations

January, 2008

**Cost Segregation Number:** 92261

3. Potheads
4. Cooling & Pressure Plants
5. Leak History
6. Failure History
7. Cable Types, Cable Lengths and Before & After Scenarios

The linking software system was installed in a central server and is now accessible from con Edison workstations around the system. Other operating areas of the company (steam, gas ) are considering implementing the system. The R&D project activities are completed and the funding authorization will be amended to reflect additional \$19K costs to complete the project. After the reauthorization of the funding, level the project will be closed out in the next reporting period.

January, 2008

Cost Segregation Number: 92264C08

Program Area: Electrical  
Distribution

Title: INSULATION TESTING OF POLYMER NON-CONDUCTIVE COATINGS FOR  
DISTRIBUTION SUBSURFACE STRUCTURES

Contractor: (IN HOUSE) ASTORIA TECH SERVICES

Cosponsors:

Project Duration: 04/11/07-- 01/08

R&D Engineer: Aromando J.

Project Engineer: GOLDMAN H.

Objective:

Test the insulating effectiveness of non-metallic coatings and determine their ability to protect against stray voltage.

Benefits:

The R&D projects which are funded through this account provide benefits to Con Edison through reduction of plant operating costs, improved availability/reliability and/or reduced emissions.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$8,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$4,396
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed **x**

Technical Status:

This project will be closed out in the next reporting period.

January, 2008

Cost Segregation Number: 92265

Program Area: Administration/Industry Group  
Administration

Title: DEVELOPMENT OF R&D DEPARTMENT WEBSITE

Contractor: (IN HOUSE) INFORMATION RESOURCES

Cosponsors:

Project Duration: 04/11/07-- 04/08

R&D Engineer: Aromando J.

Project Engineer: BARNA A.

Objective:

Develop both an Intranet and Internet site for the department as a means to communicate and promote R&D's service capabilities and accomplishments to colleagues.

Benefits:

The site helps to emphasize the value of research, development, and deployment of technologies that have a positive impact in the way Con Edison provides energy to customers.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$5,000
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
 Implementation \_ Installation \_ Demo \_ Final Report \_  
 Closed \_

Technical Status:

R&D has focused work primarily in 2007 on the development of its team site using Sharepoint 2003 and later with the new release of 2007 as per corporate website guidelines. Features on both the team and portal pages will make use of industry external links to industry research and consortium sites, provide project descriptions, reports, and video if possible, and serve as an overall resource to site visitors. 2008 will focus on further development and refinement of the site.

January, 2008

Cost Segregation Number: 92271

Program Area: Electrical  
Distribution

Title: REMOTE FEEDER ID - ARTICULATING ARM DEVELOPMENT

Contractor: ISLAND TECH.

Cosponsors:

Project Duration: 04/12/07-- 12/08

R&D Engineer: Doherty F.

Project Engineer: ASHRAF R.

Objective:

This project will design, fabricate and test a tripod-mounted articulating arm to allow placing of a galvanometer on a cable or splice in a manhole; allowing feeder identification without requiring an operator to enter the structure.

Benefits:

Development and deployment of this articulating arm assembly for identification tracing current pick-up would thus improve the safety of our employees, as well as enhance service to our customers by reducing the risk of outages.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$25,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$19,500
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding _	Engineering _	Procurement _	
	Implementation _	Installation _	Demo <input checked="" type="checkbox"/>	Final Report _
	Closed _			

Technical Status:

Prototype was designed and fabricated, and is being field tested.

January, 2008

Cost Segregation Number: 92279

Program Area: Electrical  
Distribution

Title: STATEN ISLAND PRIMARY NETWORK VISUALIZATION SYSTEM (SIPS)

Contractor: AVS

Cosponsors:

Project Duration: 04/23/07-- 12/08

R&D Engineer: Wong J.

Project Engineer: MCSWIGGAN M.

**Objective:**

The objective of the project is to perform a preliminary study to determine the withstand level of our transmission lines relative to ice build up, identify improvements needed, and ways to mitigate ice build up.

**Benefits:**

The main benefit of the project is reliability enhancement of our transmission system. Assessment of our transmission strength against ice storms and development of mitigation methods, if needed, would enhance the reliability of our system.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$135,906
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Working with the control room to develop the visualization screen from sub-transmission down to distribution level, and perform as an engineering tool for the 4 kV USA system to analyze data and perform "what-if" scenarios.

January, 2008

**Cost Segregation Number:** 92281**Program Area:** Electrical  
Distribution**Title:** CUSTOMER LOAD DEMAND MODELS DEVELOPMENT**Contractor:****Cosponsors:****Project Duration:** 04/23/07-- 09/08**R&D Engineer:** Lee S.**Project Engineer:** GHAFURIAN R.**Objective:**

Under another project CSN 92711 (Integrated System Model (ISM) validation using DEW for 3G System of the Future Design), an integrated system model including the transmission, substation and distribution down to the customer is being developed for the Sutton Network. EDD (Electrical Distribution Design, Inc.), DEW developer, is currently working with Engineering to compare and evaluate both power flow and reliability analysis against existing tools and measured data. As a result of their effort, it has been concluded that new homogenous load groups for 10,000 customers needs to be developed in order to obtain an accurate power flow model. In this project, EDD will develop new categories of homogenous customer groups to represent homogenous load patterns. Statistical method will be used to analyze large amounts of historical load demand and consumption data collected at select locations. The results are then applied to raw customer billing data to estimate the customer demands at each customer location. The information will then be applied to the DEM model and improved accuracy is expected.

**Benefits:**

This integrated system model will be used to help evaluate the 3G SOF concept designs and perform reliability evaluations.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$475,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$349,365
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

Various data sources are currently being analyzed in the development of load demand models.

January, 2008

**Cost Segregation Number:** 92288**Program Area:** Administration/Industry Group  
Industry Group**Title:** POWER QUALITY PROJECTS WITH THE CANADIAN ELECTRIC ASSOCIATION**Contractor:** CANADIAN ELECTRIC ASSOCIATION**Cosponsors:****Project Duration:** 04/25/07-- 12/12**R&D Engineer:** Barna A.**Project Engineer:** DIMITRIU C.**Objective:**

New and more cost effective avenues are needed to identify useful technologies, benchmark best industry practices, and broaden industry contacts of Con Edison's technical personal.

**Benefits:**

CEA has been found to be a cost effective mechanism to increase industry contacts, benchmark Con Edison practices, and develop new technologies that compliment other company R&D activities.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$29,523
	<b><u>Budget for the 2008:</u></b>	\$50,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Recent projects undertaken by CEA Power Quality Interest Group include:

- Tools and Methods to Access PQ Impact of DG on Distribution Feeders (ConEdison cost \$4k of a \$52k project total)
- State of the Art sensors suitable for Distribution Automation Applications (ConEdison cost \$10k of a \$48k project total)
- Method to Discriminate Between the Contributors of the customer and the Power System to harmonic Disturbances (ConEdison cost \$10k of a \$224k project total)

January, 2008

**Cost Segregation Number:** 92292**Program Area:** Electrical  
Transmission / Planning**Title:** DISBONDED COATING DETECTION FOR UNDERGROUND PIPE FEASIBILITY  
STUDY**Contractor:** NEETRAC**Cosponsors:****Project Duration:** 11/17/05-- 08/08**R&D Engineer:** Wong J.**Project Engineer:** SANTINI A.**Objective:**

Determine feasibility of a cable cleaning device to remove and contain asbestos during certain cable removal jobs.

**Benefits:**

Improved protection of the environment, increased personnel and public safety and better productivity.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$125,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$104,809
	<b><u>Budget for the 2008:</u></b>	\$80,000

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _			
	Implementation _	Installation _	Demo _	Final Report _		
	Closed _					

**Technical Status:**

Neetrac had completed a laboratory experiment on determination and sequence of disbonded coating occurrence. We had shipped two sections of 10 feet pipes from feeder 71 to NEETRAC for this experiment. Another effort is working with Penn State University on setting up a feasibility study to determine whether the current guided wave using variable excitation frequency can work in HPPF system. The initial result indicated that disbondment does not contribute to corrosion. We had requested Neetrac to refine the sample rate and repeat the sonar and vibration test for further result.

January, 2008

Cost Segregation Number: 92297

Program Area: Electrical  
Distribution

Title: MITIGATION TECHNIQUES TO REDUCE INRUSH CURRENTS OF NETWORK TRANSFORMERS

Contractor:

Cosponsors:

Project Duration: 05/01/07-- 08/08

R&D Engineer: Lee S.

Project Engineer: CHEBLI E.

Objective:

A recent review on the number of CIOA (Cut-rn Open Autos) on the Con Edison system from January 2007 to March 2007 showed that of the 37 CIOAs, 18 percent were attributed to inrush currents Open autos due to inrush current, if not probably identified and mitigated will result in time and money wasted in feeder processing. At present, the cause of the CIOAs are unknown. The problem needs to be studied in more detail in order to develop techniques for mitigation.

Benefits:

In this project, practical methodologies to reduce the inrush current of network transformers will be invesigated. At the end of the project, a final report will be provided.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$225,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$20,293
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

A complete simulation of a 3-phase network transformer using a 3-legs core was written and running satisfactory. We are using an EMTP code for the simulation. The next step would be to simulate the Hi-Pot DC source when connected between a bolted primary transformer terminals and the ground. That will allow evaluation of the affect of the oscillatory behavior of the stray-capacitance charging-currents, or discharging currents, on the residual magnetic flux in the transformer core. This step is likely to be completed in about one month. Following, we will simulate a complete feeder with all its network transformers at no-load (worse scenario from inrush standpoint).

January, 2008

Cost Segregation Number: 92302

Program Area: Electrical  
Distribution

Title: DEMONSTRATION OF DEEP THUNDER WEATHER FORECASTING FOR  
EMERGENCY MANAGEMENT OPERATIONS

Contractor:

Cosponsors:

Project Duration: 05/07/07-- 12/08

R&D Engineer: Carbonara J.

Project Engineer: DREXEL M.

Objective:

Con Edison currently collects, analyzes and disseminates various sources of weather information and forecast for use by Emergency Response Management personnel. IBM'S Deep Thunder weather model provides high-resolution local weather forecasts and has the potential to become the premier forecasting model for Con Edison in Westchester, New York City and O&R areas. Its 1x1 km grid is already the finest resolution available today. Deep thunder also has the capability through extensive visualization tools to transform and present derivative weather data specifically for managing and planning storm restoration efforts. For example the weather data could be presented as number of downed poles, transformers and conductors in a square km. As such, Deep Thunder offers the potential to realize significant improvement in Con Edison's emergency management activities.

Benefits:

Con Edison could use the enhanced Deep Thunder system to improve performance in the following areas:

- Forecasting the local effects of storms to improve the scheduling and location of restoration resources prior to storm events
- Dispatching restoration resources more effectively after storm events based on fine-scale information on weather severity
- Providing improved information on storm outages and restoration efforts to customers, public agencies, and the news media

If successful, the resulting benefits will include better utilization of personnel and resources during weather related emergencies, reduced outage time and improved system reliability.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$124,100
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

January, 2008

**Cost Segregation Number:** 92302

We completed a preliminary review of Deep Thunder's capability to forecast storm timing, severity and track as well as temperatures forecasts. This review was comparison of Deep Thunder's forecast of several storm events during the summer of 2006 with other available weather services. The initial review showed mixed results regarding storm and temperature forecast accuracy. Certain storm events over the summer were accurately predicted and others were not predicted at all. However, the review was positive with respect to Deep Thunder's model capability in providing unique localized weather information that other services did not provide. The review also pointed to the possibility of improving the forecasts by feeding back into the model observed and collected data from weather stations sited on Con Edison facilities and from other weather data sources. Two weather stations were installed during 2007. One at the Staten Island Victory Blvd Service yard and the other at the Buchanan Substation in Westchester. Additional stations are planned for 2008. We also introduced Deep Thunder model to the corporate Emergency Management group and they are now integrating the Deep Thunder forecasts into our Bronx/Westchester storm mobilization decision model.

January, 2008

Cost Segregation Number: 92303C08

Program Area: Electrical  
Distribution

Title: AMI - SPECIFICATION DEVELOPMENT

Contractor: KEMA

Cosponsors:

Project Duration: 05/09/07-- 06/08

R&D Engineer: Barna A.

Project Engineer: WOOD A.

**Objective:**

As the result of the Advanced Metering Infrastructure (AMI) Business Case Development, Con Edison is preparing to demonstrate three AMI technologies in various areas of the services territory. In support of these pilots, a Meter Data Management (MDM) system will be deployed as a part of the overall demonstration. These pilots need to be properly designed and specifications need to be developed in advance of the technology and MDM deployments. Additional R&D efforts are required for some of the key AMI elements.

**Benefits:**

These pilot projects and a full-system AMI deployment will provide benefits in the following areas: Automated Meter Reading, Time-sensitive Rate Structure, Enhanced Customer Service, Price Responsive Demand Response/Load Control, Outage Detection/Restoration, Load Study and Load Flow Analysis Load Forecasting, Demand Side Management, and others.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$120,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$119,008
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	<b>x</b>			Final Report	_

**Technical Status:**

To be closed out 2Q of 2008

January, 2008

**Cost Segregation Number:** 92305**Program Area:** Electrical  
Transmission / Planning**Title:** EVALUATION OF SATELLITE TECHNOLOGY FOR ROW INSPECTION**Contractor:****Cosponsors:****Project Duration:** 05/04/07-- 12/08**R&D Engineer:** Duggan P.**Project Engineer:** MENNELLA E.**Objective:**

Periodic Right-Of-Way Inspections are required to assess the effectiveness and need for tree trimming, integrity of shield wires and support structures, identify new non-utility structures, which could reduce clearances or otherwise jeopardize power lines, assess the extent of damage following severe storms or events, and to identify and confirm flashover locations from lightning, avian, animal or wind blown debris. These inspections are labor and time intensive effecting resistance of structures and lines to events, and restoration and repair times for transmission and distribution assets.

**Benefits:**

Evaluating the effectiveness of satellite imaging already available to meet other needs, or customized to improve performance or timeliness to meet specific utility needs will determine if these technologies could be used to improve utility preparedness and response to many of the conditions above, as well as reduce associated costs.

Reduction in the number of ROW Inspections required.

Improved effectiveness of vegetation and structure management.

Assess potential for increased frequency of image updates to support storm damage assessments.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$50,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$15,000
	<b><u>Budget for the 2008:</u></b>	\$50,000

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

Awaiting EPRI Report.

January, 2008

**Cost Segregation Number:** 92324**Program Area:** Electrical  
Substations**Title:** DEMONSTRATION OF GROUND PENETRATING IMAGING RADAR FOR FEEDER  
PLACEMENT**Contractor:** SPECTRA UNDERGROUND IMAGING**Cosponsors:****Project Duration:** 06/11/07-- 12/08**R&D Engineer:** Carbonara J.**Project Engineer:** MOONEY J.**Objective:**

Construction of new underground transmission facilities can be complicated by the lack of detailed maps giving accurate locations and the nearby presence of water, sewer, communications structures and abandoned infrastructure such as trolley tracks. Currently, test pits are dug at the planning stage to confirm the location of potential conflicts to provided detailed information for integration into final design or field modifications. However, in some locations test pits are not always feasible due to obstructions, traffic patterns and local municipality restrictions. If accurate maps of the underground area of interest were available, project cycle times would be reduced and safety when digging near critical facilities improved. In the long run, the need for test pits may be significantly reduced. A new generation of ground-penetrating imaging radar and associated data processing algorithms have been successfully demonstrated to map underground structures on a large scale. The GPR system makes use of a multi channel array of radar receivers and signal processing techniques to provide subsurface images. The maps of underground facilities generated from GPR systems may provide the equivalent information similar to that obtained from test pits

**Benefits:**

Successful deployment of ground penetrating radar imaging technology will reduce test pit expenses and exploratory excavation and improve design and project cycle times. Safety when digging near critical facilities will be improved. In the long term, test pit digging may be significantly reduced.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$190,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$184,571
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

Spectra Underground Imaging (Spectra) was contracted to provide underground imaging services including subsurface mapping and design

January, 2008

**Cost Segregation Number:** 92324

assistance for the proposed high voltage (345 kV) transmission feeder line in Yonkers, NY. The underground imaging survey represents over 26,000 linear feet of scanning using a multi channel array of radar receivers and signal processing techniques to provide subsurface images. To date all of the data collection for the Yonkers survey area was completed. Spectra provided the interpretation, mapping and final reporting for the Yonkers survey area. Test pits will be constructed along the proposed route and results from the test pits will be compared to the drawings from the GPIR scan survey. Preliminary results from a few test pit data indicate that there is a good match between the scan results and the tests pits.

January, 2008

Cost Segregation Number: 92325

Program Area: Electrical  
Distribution

Title: TROPICAL WOOD POLES - DEMONSTRATION AND TRIAL USE

Contractor:

Cosponsors:

Project Duration: 06/15/07-- 12/08

R&D Engineer: Doherty F.

Project Engineer: PETERMAN M.

Objective:

This project is a follow-on project to CSN 92765 which procured the poles in collaboration with other utilities via EPRI. This follow-on funding will cover inspection, storage and handling on the poles not provided for in the original appropriation, as well as other incremental costs for care and monitoring of this initial demonstration population.

Benefits:

Effective assessment of the practicability of these poles for use on our system; and, if adopted, a demonstration of leadership in environmental excellence.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$40,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$14,251
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo  Final Report \_  
Closed \_

Technical Status:

First delivery of poles revealed issues with conformance to specification. Enough poles were available however to install in field, and these poles are being monitored for durability and performance.

January, 2008

Cost Segregation Number: 92326Program Area: Electrical  
Transmission / PlanningTitle: 138 KV Y-BRANCH JOINT TESTINGContractor: SUMITOMOCosponsors: SUMITOMOProject Duration: 12/14/05-- 06/08R&D Engineer: Wong J.Project Engineer: GHAFURIAN R.**Objective:**

Type Test the high voltage 138 kV Y-Joint as according to North American Standard prior to install this in the field. Additional effort will be added in 2007 to include repair training for Con Edison splicers.

**Benefits:**

Potential benefits from improved system reliability and labor productivity are sizeable.

1. Improve overall transmission network system reliability.
2. Increase customer satisfaction.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$336,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$326,741
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The joint is being assembled in Japan, type test had been completed on May 2007. An intensive repair training sessions for Con Edison's splicers will be setup for May 2008. Additional efforts will be added in 2008 to include repair training for Con Edison splicers and coordinate setup for the commissioning test for this accessory for the Mott Heaven to Parkview 138 kV XLPE feeder.

January, 2008

Cost Segregation Number: 92333

Program Area: Electrical  
Transmission / Planning

Title: GROUND SIGNATURE SYSTEM (GSS) ENHANCEMENT

Contractor:

Cosponsors:

Project Duration: 10/26/01-- 04/09 R&D Engineer: Wong J.

Project Engineer: GILLANDER J.

Objective:

Two focus of this project. To enhance the current control panel of GSSS to provide a more user friendly menu and presetting of system parameters; to design a medium size probe.

Benefits:

To eliminate unwanted operation and tripping. Result in reduction in the operation and maintenance cost during normal and emergency conditions.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$1,037
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

Technical Status:

We had several meetings with Substation Operation and due to workload this project is delayed and now will not start until April 2008.

January, 2008

**Cost Segregation Number:** 92338C08**Program Area:** Electrical  
Distribution**Title:** COMPUTER AIDED LEAN MANAGEMENT (CALM) AT THE MANHATTAN ENERGY CONTROL CENTER (MECC)**Contractor:** COLUMBIA UNIVERSITY**Cosponsors:****Project Duration:** 09/29/05-- 01/08      **R&D Engineer:** Lee S.**Project Engineer:** SNIFFEN M.**Objective:**

Columbia University will evaluate events leading to failures in addition to attributes leading to closed in open autos (CIOSs), fail on tests (FOTs) and Out of Emergencies (OOEs).

**Benefits:**

The ability to predict failures and events will help us optimize how we operate the distribution system. For example, we will be able to correct problems before they become emergencies making best use of our resources and equipment. Development of analytical tools that can help us achieve this has tremendous value.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$880,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$865,108
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding _	Engineering _	Procurement _
	Implementation _	Installation _	Demo _
	Closed <input checked="" type="checkbox"/>	Final Report _	

**Technical Status:**

MECC: Columbia University is arranging for better connections to Con Ed data with IR. "Online methods" for using multiple machine learning models that can change daily are being developed. Improvements to MartiRank have been done and are being continued. Several infrastructure activities including improving the way we produce graphs and orchestrate machine learning components are underway. 2006 attributes and additional attributes including PQ Node events are being pursued. In addition, Columbia University is currently working with Chris Jones from Distribution Engineering to develop a susceptibility ranking for network distribution transformers. Datasets are currently being developed to be installed in the machine learning system. Some initial machine learning have been done on the transformer data, and ways to deal with a large amount of missing data are being explored. The final report for this project is currently being prepared.

This project is complete and the final report is on file.

January, 2008

Cost Segregation Number: 92347

Program Area: Electrical  
3G System of the Future

Title: 3G SOF INDEPENDENT RELIABILITY ASSESSMENT OF HUDSON YARD LOAD  
T

Contractor: EDD

Cosponsors:

Project Duration: 01/29/06-- 06/08                      R&D Engineer: Lee S.

Project Engineer: WEISENFELD N.

Objective:

The 3G SOF team is investigating alternative power supply systems for the Hudson Yard Load area that will ultimately maximize the utilization of the installed equipment.

Benefits:

An alternative method will be used to evaluate the reliability of the proposed Hudson Yard load transfer design.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$485,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$485,791
	<u>Budget for the 2008:</u>	\$0

Schedule:    Funding \_    Engineering \_    Procurement \_  
                  Implementation \_    Installation \_    Demo \_    Final Report \_  
                  Closed **x**

Technical Status:

In this project, a software model is currently being built to compare the reliability with the existing system. A written report is currently being prepared to document the Jeopardy methodology.

A prototype model has been built. This project will be closed during the 2nd Qtr. 2008.

January, 2008

**Cost Segregation Number:** 92349**Program Area:** Electrical  
Distribution**Title:** PHASE III COMPOSITE COVER LOADING**Contractor:** STRUCTURAL SCIENCE (SS)**Cosponsors:****Project Duration:** 02/28/06-- 06/08**R&D Engineer:** Aromando J.**Project Engineer:** MEKHAIEL N.**Objective:**

Distribution Engineering is evaluating the possibility of using non-metallic, non-conductive, composite materials as an alternative to cast iron manhole covers and cast iron or steel trench panels for service boxes, using venthole designs. Their evaluation will be done through a series of extensive tests to prove how durable Structural Science's prototype covers are. EPRI has performed blast tests on the S-type trench panels to determine how well the covers stand up to simulated feeder gas explosions. Both Structural Science and Lucius Pitkin performed static and fatigue tests to determine the durability of the panels to repeated loading simulating traffic urban load.

**Benefits:**

Composites are non-conductive and have the potential to minimize the public's exposure or accidental contact with subsurface covers that are electrically live.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$225,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$211,086
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo  Final Report \_  
Closed \_

**Technical Status:**

Six prototype S-type vented composite panels from SS had undergone both static and fatigue load tests and blast tests at Lucius Pitkin and EPRI respectively. One vented panel was field-tested in the sidewalk starting in 2006 and observed for its performance and has shown minimal wear by end of 2007, thus performing satisfactorily.

January, 2008

**Cost Segregation Number:** 92352**Program Area:** Electrical  
Distribution**Title:** SECONDARY MONITORING SUTTON NETWORK PILOT**Contractor:** APPLIED MESH TECHNOLOGIES**Cosponsors:****Project Duration:** 06/20/07-- 10/08**R&D Engineer:** Barna A.**Project Engineer:** STERGIOU P.**Objective:**

Monitoring the secondary network is a non-trivial task that has challenged the industry for more than 50 years. Physical and financial constraints coupled with technology shortfalls made it next to impossible. However, with today's sensor technology, microprocessors, and communications options, secondary monitoring may be possible. Our previous experiments indicate that an AMI ready smart meter can be adapted to monitor secondary cables in the underground manholes. We plan to install these meters (micro RTU) in 50 locations (a total of 100 micro RTUs will be installed) in Sutton network to test the performance of the technology and to validate load flow models. Additional funding is needed for development of phase identification tool for low voltage cables and installation of micro RTUs.

**Benefits:**

Improved monitoring of the secondary system will provide information about performance and status of the secondary cables in the underground structures. This information will advance our knowledge about the network status during multiple feeder outages and help us mitigate extended secondary outages.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$490,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$378,469
	<b><u>Budget for the 2008:</u></b>	\$50,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

A micro RTU device was designed with Applied Mesh Technologies. More than 20 devices were installed in manholes in the Sutton network in 2007. A total of 100 devices will be installed in Sutton before the summer of 2008. Performance of micro RTUs will be monitored over the summer. Additionally, IR is working on the integration of data from micro RTU devices into company load flow models.

January, 2008

Cost Segregation Number: 92355

Program Area: Electrical  
Distribution

Title: WEAR TESTING FOR COMPOSITE TRENCH PANELS

Contractor: LUCIUS PITKIN

Cosponsors: DISTRIBUTION ENGINEERING

Project Duration: 06/20/07-- 12/08

R&D Engineer: Aromando J.

Project Engineer: CORVIGNO J.

**Objective:**

Test the wear and durability of composite covers when installed in traffic and sidewalk areas. Verify that worn covers maintain loading requirements while in service as per NYCDOT and AASHTO. Analyze the useful life expectancy of composite covers.

**Benefits:**

Composite materials are non-conductive, ergonomically-friendly, and lighter to handle and transport. The value of the wear test results will provide Engineering the information needed to analyze both the useful life and economic feasibility of composite materials as alternatives to cast iron or steel covers.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$50,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$6,000
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation  Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Lucius Pitkin completed the test rig set-up to perform the wear tests. Distribution Engineering is in consultation with Structural Science, whose covers will undergo wear testing, to procure the prototype cover that will match the field design of those covers that will go out in the field. Testing is scheduled to begin in the second quarter of 2008.

January, 2008

Cost Segregation Number: 92356

Program Area: Electrical  
3G System of the Future

Title: 3G SYSTEM OF THE FUTURE 2006 ACTIVITIES

Contractor: VARIOUS

Cosponsors:

Project Duration: 03/06/06-- 12/08

R&D Engineer: Duggan P.

Project Engineer: ANDERSON J.

Objective:

The 3G-System of the Future implementation Tasks are intended to translate concepts and design alternatives into specific application design templates. The initial design template will be created for new load growth pockets, which allows more freedom to develop an independent overlay design. This will subsequently be further developed into a design template that can be used to support evolutionary changes to the existing system design as part of broader substation (Xfmr, Switchgear and Cable) life extension programs. The goal of the design templates is to use equipment and technologies as they become available to meet increased load demands and life extension needs using less equipment with better asset utilization, shared spare capability and much more diagnostic and smart switching capability to more effectively and efficiently operate our own equipment, as well as exploit synergies and benefits that may emerge from coordination with DSM as spinning reserve, Building HVAC and facilities control, Advanced Metering, Customer portals and distributed resources.

Benefits:

The intent of this RADPAR is to encourage vendor development of these and other devices and where deemed in Con Edison's interest apply limited funding to evaluate feasibility and/or accelerate availability (e.g. a \$200,000. payment by Con Edison accelerated the SSCL development start by 1 year) of specific equipment that would support the 3G System of the Future. Where ever possible these efforts would partner with vendors and/or other stakeholders to minimize Con Edison expenditures (e.g. \$50,000. minor shares in NYPA/NYSERDA NAS Battery development and SuperPower-DOE Superconducting Matrix Type Fault Current Limiter). The System of the Future Design templates have identified new functionalities like fault current limiting and new types of equipment such as submersible vault locatable 13kV Switches that would be needed to fully enable the improved asset utilization, reduced cost goal of the 3G-System of the Future while preserving high reliability. Other equipment may also be initially developed by others that could be adapted to our specific application needs.

It is also essential that we work with DOE and DARPA and others to use new materials such as SiC to develop new power electronics devices and packaging to reduce the size and costs of both fault current limiters (to draw in distributed generation developers as

January, 2008

**Cost Segregation Number:** 92356

collaborating stakeholders), and to reduce the footprint and cost of other fault current limiters as they migrate to transmission voltages and FACTS devices and HVDC terminals for deployment in both distribution and transmission applications.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$425,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$434,484
	<b><u>Budget for the 2008:</u></b>	\$250,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The intent of this RADPAR is to encourage vendor development of these and other devices and where deemed in Con Edison's interest apply limited funding to evaluate feasibility and/or accelerate availability (e.g. a \$200,000. payment by Con Edison accelerated the SSCL development start by 1 year) of specific equipment that would support the 3G System of the Future. Where ever possible these efforts would partner with vendors and/or other stakeholders to minimize Con Edison expenditures (e.g. \$50,000. minor shares in NYPA/NYSERDA NAS Battery development and SuperPower-DOE Superconducting Matrix Type Fault Current Limiter). The System of the Future Design templates have identified new functionalities like fault current limiting and new types of equipment such as submersible vault locatable 13kV Switches that would be needed to fully enable the improved asset utilization, reduced cost goal of the 3G-System of the Future while preserving high reliability. Other equipment may also be initially developed by others that could be adapted to our specific application needs.

It is also essential that we work with DOE and DARPA and others to use new materials such as SiC to develop new power electronics devices and packaging to reduce the size and costs of both fault current limiters (to draw in distributed generation developers as collaborating stakeholders), and to reduce the footprint and cost of other fault current limiters as they migrate to transmission voltages and FACTS devices and HVDC terminals for deployment in both distribution and transmission applications.

January, 2008

Cost Segregation Number: 92359Program Area: Electrical  
DistributionTitle: NETWORK FEEDER DISCONNECT SWITCH DEVELOPMENTContractor: ELASTIMOLD - THOMAS & BETTSCosponsors:Project Duration: 03/06/06-- 06/08R&D Engineer: Doherty F.Project Engineer: SIMON D.Objective:

Electric Operations has identified storm surge flooding as a credible risk to its network distribution system, especially in lower Manhattan. This project designs, develops and test-certifies a small high-capacity submersible disconnect switch to mitigate the potential damage.

Benefits:

The new switch will allow operators to deenergize network transformers in the event of a flood or other adversity to mitigate damage and limit the scope of outage.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$145,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$140,934
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report **x**  
Closed \_

Technical Status:

The team worked with Elastimold-Thomas&Betts to explain their needs and collaborate on a practical design. During development, the multi-discipline team recognized that the new switch would also be useful for network splits, reducing the intermesh duration from days to hours. Presently, the switches have been installed for use in several network load transfer projects and are being scheduled to be installed for storm surge damage mitigation in Manhattan. This project is in the process of being closed.

January, 2008

Cost Segregation Number: 92363Program Area: Electrical  
DistributionTitle: DISTRIBUTION EQUIPMENT REPLACEMENT RANKING AND VISUALIZATION  
TOOLContractor:Cosponsors:Project Duration: 06/27/07-- 06/08R&D Engineer: Lee S.Project Engineer: CHOW M.Objective:

For the past ha years, Columbia University has been developing computer intelligence sohare needed for determining the best designs for the transition to Condition Based Maintenance (CBM). Working with distribution engineering and electric operations, Columbia University used machine learning algorithms to develop a predictive tool to identify not only which feeders are likely to fail in the following summer but also which component and the location of the component. They have also evaluated the effectiveness of the Hi-Pot testing program and refined the program operation in order to further lower OAs during the following summer. The goal is to develop a fix-before-break program for our distribution cables and joints. To facilitate optimization of a replacement strategy, one visualization and ranking tool that combines PILC, reinforcement and reliability replacement is needed.

Benefits:

The data gathering protocols and prediction tools developed on this project will allow improved replacement planning for distribution cables and splices. Ultimately, accurate survival and failure predictions will guide selection of discrete components for replacement in order to minimize operating failures and reduce overall costs.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$135,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$143,165
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

A prototype CAPT software tool has been developed for distribution equipment ranking and replacement prioritization. This project will be closed by 2nd Qtr. 2008.

January, 2008

**Cost Segregation Number:** 92373**Program Area:** Electrical  
Customers**Title:** DISTRIBUTED ENERGY RESOURCE PROGRAM SERVICES (CERA, ENERGY INSIGHTS, EPRI SOL.)**Contractor:** CERA, ENERGY INSIGHTS**Cosponsors:****Project Duration:** 04/06/06-- 12/08**R&D Engineer:** Carbonara J.**Project Engineer:** CARBONARA J.**Objective:**

Explore and demonstrate new technologies and information access and utilization that would enhance the operation and performance of our electric system and our service to our customers by participating in the CERA and other Distributed Energy Services.

**Benefits:**

Our participation in the CERA and other Distributed Energy Services will allow company personnel to gain access to a source of independent analysis, strategic insights and in-depth assessments related to retail distributed energy markets, services and technologies.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$55,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$64,800
	<b><u>Budget for the 2008:</u></b>	\$25,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

Availing our Company to the CERA and other Distributed Energy (DE) Services allows company personnel to acquire information and analysis related to state of the art and emerging technologies in the distributed energy area. We participated in the CERA and Energy Insight DE services for 2007 and plan to continue into 2008. The CERA DE Services were incorporated into a larger program area called the North American Power Advisory series. We anticipate continuing our participation in these series in the 2008-2009 timeframe.

January, 2008

Cost Segregation Number: 92374

Program Area: Energy & Environmental  
Environmental

Title: EPRI/NYSERDA/DOE TRAVEL BY ENVIRONMENTAL AFFAIRS PERSONNEL

Contractor:

Cosponsors:

Project Duration: 01/28/91-- Continuing R&D Engineer: O'Sullivan R.

Project Engineer: O'SULLIVAN R.

Objective:

Facilitate application of new technologies by supporting employee attendance at industry meetings.

Benefits:

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals and surface new research initiatives.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$550,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$298,224
	<u>Budget for the 2008:</u>	\$10,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

N/A

January, 2008

**Cost Segregation Number:** 92375**Program Area:** Electrical  
Customers**Title:** INTERACTIVE WEB KIOSK FOR UTILITY APPLICATIONS FIELD  
DEMONSTRATION**Contractor:** TIER (FORMERLY EPOS)**Cosponsors:****Project Duration:** 12/14/01-- 06/08**R&D Engineer:** Carbonara J.**Project Engineer:** KAMINEK D.**Objective:**

The objective of this project is to develop, design, and demonstrate an advanced interactive web based kiosk for Con Edison's business office environment. The main goal of this R&D effort is to provide application feasibility, technical assessment, operating performance, and customer acceptance of this emerging technology.

**Benefits:**

Potential benefits include significant reduction in bill processing costs, improvement in the quality of the Company operating practices, and satisfying customer needs. Benefits include:

- 1) Greater productivity of Company's business offices.
- 2) Improved customer satisfaction and effective resource allocations.
- 3) Responsiveness in a competitive environment.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$310,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$282,134
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

Design review meetings were held and an assessment of the kiosk concept was completed. Most of project team recommendations were submitted and the vendor has incorporated these performance enhancements in the kiosk design. A provision for Spanish speaking customers was added. R&D issued a purchase requisition to accommodate this Spanish add-on development cost. A review meeting with the vendor, kiosk casing subcontractor, IR, Customer Operations, Facility Engineering, and Public Affair was held to define kiosk style, materials, components, and prototype design and delivery. It was decided that a single kiosk casing design is preferable that the original "obelisk - four panel" design for easy installation, safety, and customer attraction. The single kiosk unit will measure 68" H x 26" W x 18" D and weight 400 lb. The initial two units were delivered and installed at Irving Place Reception Area and at the new Fordham Road Service Center in the

January, 2008

Cost Segregation Number: 92375

Bronx. Both systems are operational and we're getting feedback from customers as they're using them. So far, it's been very favorable.

With the Bronx office experiencing more traffic, we were able to get an excellent sense of additional changes needed to integrate into the transaction process. We identified both hardware and software changes, which we implemented before the two additional units were shipped for Westchester and Brooklyn. The vendor completed the entire software re-write (at no expense to Con Edison) which provides better presentation, better graphics and full Spanish transactions. The new software was installed on the two remaining units which were shipped from Alabama long with two new lower doors for the existing production units. The two units were installed at the Harlem business office and the Mt. Vernon Pathmark office. Everything was installed by TIER technicians in one visit. The existing units were retrofitted with new rails and the doors. The retrofit of the new doors will provide better access to the thermal receipt printer to facilitate paper replacement. The software upgrade of the existing two units were also completed.

We also evaluated the capability of processing cash payments onto the kiosk. A proposal was received from TIER to provide this capability. We processed this modification to the existing contract. The cash kiosk module units were delivered with this capability. The cash kiosks were evaluated and found to be reliable in accepting cash payments. We deployed several units in the actual customer service locations. Several prototype kiosk units were delivered for Con Edison's and O&R evaluation. The initial units were delivered and installed at the new Fordham Road Service Center in the Bronx as well as for Westchester and Brooklyn. The results so far have been very positive. The excellent success of our kiosk systems has significantly reduced teller lines and customer wait time and improved customer satisfaction. We don't anticipate any further development in 2008 and will initiate a project close out.

January, 2008

Cost Segregation Number: 92378Program Area: Electrical  
DistributionTitle: NETWORK DUCT RECLAMATION SYSTEMContractor:Cosponsors:Project Duration: 01/25/02-- 06/08R&D Engineer: Carbonara J.Project Engineer: PITSOULIS K.Objective:

Develop and demonstrate a cost effective system that will allow us to reclaim ducts that are obstructed by burned or broken cables.

Benefits:

The company expense attributed to obstructed ducts in Manhattan is approximately \$15 million per year. The new system, if successful, can decrease these expenditures by \$10 million dollars. In addition to cost savings, reclaimed ducts are assets that can generate revenue. Reclaiming ducts also increases the reliability of the system by allowing faster restoration of network feeders. In congested areas like Manhattan, space is at a premium and reclaiming ducts fully utilizes this space undue hardship on the community is also avoided by forgoing excavations.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$149,980
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

A brainstorm workshop was held with representatives of cable repair crews from Manhattan and other boroughs. The workshop's purpose was to identify possible process improvements, cost reduction, technology and research needs of the cable pulling and duct reclamations operations. The workshop was successful in identifying various improvements in the equipment used to reclaim ducts. One of the improvements identified pertained to a new cable pulling vehicle with features that facilitate the removal of cable from the ducts. A design was developed and procurement of the vehicle will be coordinated with our Transportation department. This effort was completed to coincide with Transportation's vehicle procurement and delivery schedule. A new reel loader body development and integration with vehicle was completed. We don't anticipate further development under this project. We will initiate a project close out in the next reporting period.

January, 2008

**Cost Segregation Number:** 92382**Program Area:** Electrical  
Distribution**Title:** VACTOR TRUCK JOB ASSIGNMENT AND MONITORING DEMONSTRATION**Contractor:** BBN**Cosponsors:****Project Duration:** 06/28/07-- 01/09**R&D Engineer:** Carbonara J.**Project Engineer:** CHOW M.**Objective:**

The Edison project team of Electric Operations are looking at opportunities to identify and to remove inefficiencies in work processes and have identified the management of Vactor trucks as an area to be assessed and researched. Con Edison's Vactor Trucks in Brooklyn/Queens and Bronx/Westchester service areas have been outfitted with GPS units and supervisors have been given client software that permits them to monitor the position of the trucks on a map display. A follow-on effort has been identified to increase the functionality and performance of this capability. We would like to add "drag-and-drop" Vactor job assignment and dispatching by adding new elements to the map display, starting with job locations and job details. Also, the Vactor truck operation group would like to explore opportunities to develop optimized job assignments.

**Benefits:**

By integrating the Job data and the Truck data on a single interface the Vactor supervisor will be able to more effectively dispatch trucks.

With simply the GPS available the WQ supervisor reports a 25% improvement in productivity. The principal goal of the program is to reduce the waiting times of work crews that need a structure cleaned before commencing work. It has been estimated that the current waiting time is approximately three hours. This tool should reduce waiting by getting more structures cleaned before crews even arrive, due to the increased efficiency and the discipline brought to bear through the requirement to use the Vactor Services application to schedule all jobs. The interactive map display will permit more efficient dispatch to emergency jobs due to the improved situational awareness of the Vactor supervisors.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$422
	<b><u>Budget for the 2008:</u></b>	\$65,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The funding for this project was authorized. We met with potential

January, 2008

Cost Segregation Number: 92382

contractor, BBN, to discuss project tasks and detailed scope of work. A proposal was requested and a purchase requisition issued to contract the services of BBN. Once the contract is in place a project kickoff meeting will be planned with all participating departments.

January, 2008

Cost Segregation Number: 92387

Program Area: Electrical  
Customers

Title: EPRI/NYSERDA/DOE TRAVEL BY CUSTOMER SERVICE PERSONNEL

Contractor:

Cosponsors:

Project Duration: 01/28/91-- Continuing R&D Engineer: O'Sullivan R.

Project Engineer: O'SULLIVAN R.

Objective:

Facilitate application of new technologies by supporting employee attendance at industry meetings.

Benefits:

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals and surface new research initiatives.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$135,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$112,941
	<u>Budget for the 2008:</u>	\$10,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

N/A

R&D Project Status Report

January, 2008

Cost Segregation Number: 92388

Program Area: Electrical  
Transmission / Planning

Title: EPRI/NYSERDA/DOE TRAVEL BY SYSTEM & TRANSMISSION OPERATIONS  
PER

Contractor:

Cosponsors:

Project Duration: 01/28/91-- Continuing R&D Engineer: O'Sullivan R.

Project Engineer: O'SULLIVAN R.

Objective:

Facilitate application of new technologies by supporting employee attendance at industry meetings.

Benefits:

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals and surface new research initiatives.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$310,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$282,704
	<u>Budget for the 2008:</u>	\$10,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

N/A

January, 2008

Cost Segregation Number: 92394

Program Area: Electrical  
Distribution

Title: EPRI/NYSERDA/DOE TRAVEL BY ALL OTHER NON-R&D PERSONNEL

Contractor:

Cosponsors:

Project Duration: 01/28/91-- Continuing R&D Engineer: O'Sullivan R.

Project Engineer: O'SULLIVAN R.

Objective:

Facilitate application of new technologies by supporting employee attendance at industry meetings.

Benefits:

Participation in industry research programs will help identify new technology applications which will aid in meeting corporate goals and surface new research initiatives.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$120,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$99,431
	<u>Budget for the 2008:</u>	\$25,000

<u>Schedule:</u>	Funding _	Engineering _	Procurement _	
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _	Final Report _
	Closed _			

Technical Status:

N/A

January, 2008

**Cost Segregation Number:** 92399**Program Area:** Electrical  
Transmission / Planning**Title:** DEVELOPMENT OF NEW FREEZE-THAW METHODS TO REDUCE RECOVERY TIME  
OF PIPE-TYPE FEEDERS**Contractor:** CHR INC, PMX**Cosponsors:****Project Duration:** 02/11/02-- 06/08**R&D Engineer:** Carbonara J.**Project Engineer:** REZA GHAFURIAN**Objective:**

Investigate, evaluate and test new techniques to reduce freezing and thawing time of the electric cables making the cable feeder operable at the earliest time.

**Benefits:**

Reducing the freezing and thawing time for oil-filled cable repair will result in lower repair labor expenses and increase availability of the cable feeder to the system.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$498,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$458,356
	<b><u>Budget for the 2008:</u></b>	\$75,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

During the May 2005 Field Validation Test, Con Edison personnel conducted a field freeze/thaw test for one freeze site at the 39th street and 1st Avenue to verify the application of new methodology (hardware and procedures). The activities included hardware setup, freeze startup, interruption of liquid nitrogen flow for 3 hours (to determine minimum safety margin) and freeze duration of approximately 7 days followed by a thaw. The observations and findings from this field test included the following:

- The operators were very receptive towards the new hardware and procedures and easily grasped the use of liquid nitrogen flow controllers and new procedures.
- Immediately after the frozen plug was established, liquid nitrogen flow was interrupted for three hours. The freeze held and it was determined that it would have held for another 3.5 hours.
- During the steady state, the flow controllers increased the superheat value of the nitrogen exhaust causing pipe surface temperatures (and as such oil) to be warmer by at least 50 degrees Celsius compared with current field values.

January, 2008

**Cost Segregation Number:** 92399

- 30% less liquid nitrogen was consumed under the new method.
- The freeze prevention heaters prevented formation of ice on the freeze jackets, which had been the cause for many delays in thawing of the frozen oil.
- One of the two-thaw heaters failed to operate. Since then, a design modification corrected the problem.

During September 2005, tests were conducted on the fabricated test rig to supplement the March 2003 tests. Tests were conducted with DCL100 and included thaw by natural convection to determine the maximum extent of safety margin. We also conducted tests with DCL500 to round out the 2003 tests. Also, three thermocouples were installed inside the test pipe to monitor the electric cable temperatures at different radial locations. Some of the findings from these tests were the following:

- The daily liquid nitrogen used to maintain the freeze (steady state) during the tests was 60% less than the daily average nitrogen consumption under steady state using the current methodology for freezes operations.
- The newly designed thaw heaters performed very well. The thaw was over in approximately 2.5 hours. Both thaw heaters and the 2-inch insulation performed very well and maintained their integrity under temperature extremes.
- The frozen plug lost its pressure integrity in approximately 11 hours under a thaw that was achieved by natural convection (maximum extent of safety margin).
- The initial pipe/oil temperature significantly affects freeze time.
- Tests confirmed temperature gradient (essential in a conduction process) between the pipe inside wall and the dielectric fluid in the range of 30 to 50 degrees Celsius.

The two primary enabling equipment, the liquid N2 supply regulating valve assembly and the heater/thaw electric heater blankets were delivered to Transmission Operations for field use. We also developed Engineering procedures and operating instructions to allow field forces to use the new methodology.

Additional upcoming project activities include full scale field-testing of the new methodology, preferably using dead feeders. In the longer term, a new freeze jacket will be designed and fabricated followed by testing of the new jacket. This activity may be the subject of a new project appropriation.

January, 2008

Cost Segregation Number: 92403

Program Area: Electric Vehicles  
Electric Vehicles

Title: PLUG-IN HYBRID ELECTRIC VEHICLE PROJECTS

Contractor:

Cosponsors:

Project Duration: 07/12/07-- 07/08

R&D Engineer: Barna A.

Project Engineer: FROST T.

Objective:

Con Edison will participate in various studies, stakeholder groups and consortia to review the impact and integration of plug-in hybrid electric vehicles on the electric grid.

Benefits:

By taking a proactive approach we will be able to help facilitate a reasonable safe and allowable PHEV penetration onto our grid while concurrently maintaining the reliability and safety of our system.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$14,710
	<u>Budget for the 2008:</u>	\$200,000

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

We have joined the EPRI PHEV Infrastructure Working Group and the Taratec/CAR PHEV stakeholder's group, attended several meetings with the OEM's and other utilities to help design and determine what steps are needed to successfully help deploy and integrate PHEV's onto our grid which include dense urban load centers.

January, 2008

**Cost Segregation Number:** 92405**Program Area:** Electrical  
Distribution**Title:** ELECTRIC SYSTEM MODEL BUILDING & MAINTENANCE TOOL DEVELOPMENT  
AND DEMONSTRATION - PHASE I**Contractor:****Cosponsors:****Project Duration:** 07/16/07-- 06/08**R&D Engineer:** Doherty F.**Project Engineer:** CHOW M.**Objective:**

The company is engaged in developing an integrated electric system model both to evaluate alternate infrastructure designs and to improve system intelligence, reliability and efficiency. Current models do not support these needs, and a significant upgrade is needed. Initial model development work looks promising, and has identified one of the hurdles that must be overcome as building the new models from the components in the present models. We seek a computer tool that will automate the model building, anomaly identification and update maintenance of the new model. The original appropriation is being increased to cover the unanticipated cost of the field trials and iterative enhancements.

**Benefits:**

The model building and maintenance tool scoped out on this project will allow improved model building and maintenance, and thus aid the realization of an integrated electric system model that will allow optimization of distribution systems design, operation and maintenance.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$189,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$188,250
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	<b>x</b>

**Technical Status:**

Feasibility report received. Follow on work in progress. Project to be closed out.

January, 2008

Cost Segregation Number: 92409

Program Area: Electrical  
Distribution

Title: STRAY VOLTAGE MITIGATION - CEA PROJECTS

Contractor:

Cosponsors:

Project Duration: 04/07/06-- 04/08

R&D Engineer: Barna A.

Project Engineer: BARNA A.

Objective:

In the first of these projects we will develop a guidebook for stray voltage in high density environments.

Benefits:

Enhance our stray voltage knowledge base and the guidebook deliverable will be a useful tool to mitigate stray voltage and enhance public safety.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$0
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

A guidebook, "Stray Voltages in High Load Density Environments - Causes, Effects, Measurement, and Mitigation Techniques", was delivered.

This guidebook will help enhance our stray voltage knowledge base and is a useful tool to help mitigate stray voltage and enhance public safety in conjunction with our other stray voltage efforts.

January, 2008

Cost Segregation Number: 92410

Program Area: Electrical  
Distribution

Title: PHASE IDENTIFICATION TOOL-DEMONSTRATION

Contractor: NDB TECHNOLOGIES

Cosponsors:

Project Duration: 07/17/07-- 09/08

R&D Engineer: Barna A.

Project Engineer: SIMON D.

Objective:

A number of preliminary tests have been performed in the field with the FC2200 cable phase identification system manufactured by ndb technologies. Initial test results were promising but additional tests need to be performed several devices will be purchased and given to workers in various boroughs for further evaluation.

Benefits:

This tool can reduce feeder processing time and therefore may improve overall distribution system reliability. It will also reduce operating and maintenance costs by reducing stand-by crew time.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$25,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$19,780
	<u>Budget for the 2008:</u>	\$25,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo  Final Report \_  
Closed \_

Technical Status:

Five FC2200 phase ID systems were purchased from ndb Technologies and given to FOD. A training session is being set up with the vendor by Dan Simon.

January, 2008

Cost Segregation Number: 92416

Program Area: Electrical  
Distribution

Title: GROUND PENETRATING RADAR ROADWAY INTEGRITY INSPECTION

Contractor: SPECTRA ENVIRONMENTAL GROUP INC.

Cosponsors:

Project Duration: 05/02/06-- 06/08

R&D Engineer: Barna A.

Project Engineer: BARNA A.

Objective:

Verify the application and accuracy of the Ground Penetrating Radar technology for roadway integrity. We will scan, evaluate the results, and then make a determination of the validity of this technology. The added bonus is that the maps generated of the underground structures can be compared to our current maps and used as a bi-directional validation process.

Benefits:

Ground Penetrating Radar is a non destructive sub-surface inspection and locating tool. Ground Penetrating Radar Imaging Technology gives a comprehensive picture of the road surface integrity along with accurate mapping of all associated underground facilities in the scanned area. Implementing this technology helped reduce the likelihood of an incident.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$34,342
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report **x**  
Closed \_

Technical Status:

This project is scheduled to be closed out by the end of the second quarter of 2008.

January, 2008

Cost Segregation Number: 92420

Program Area: Electrical  
Distribution

Title: HIGH TENSION MONITORING DATA ACQUISITION SYSTEM

Contractor: APPLIED MESH TECHNOLOGIES (AMT)

Cosponsors:

Project Duration: 05/04/06-- 10/08                      R&D Engineer: Barna A.

Project Engineer: NARDO L.

Objective:

This project seeks to demonstrate the ability to deliver load information from HT vaults using revenue meters and to develop interface to VDAMS and other databases and applications that are used for power quality information.

Benefits:

Improve load modeling of Hight Tension feeders, provide correct and up-to-date data for load flow studies, provide better load forecasting and HT equipment sizing, provide tool for load analysis in contingency situations, provide billing information.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$193,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$141,993
	<u>Budget for the 2008:</u>	\$0

Schedule:    Funding \_    Engineering \_    Procurement \_  
                  Implementation \_    Installation \_    Demo     Final Report \_  
                  Closed \_

Technical Status:

A purchase order was issued in June 2006 for the development of the HTMDAS system.

1. System requirements and specifications have been defined.
2. HTMDAS deign model has been developed.
3. Meter communication interface hardware has been developed
4. 26 HTMDAS units were installed in Washington Heights in 2007
5. Data integration with Con Edison Applications is currently in progress
6. Additional installations are scheduled for 2008

January, 2008

Cost Segregation Number: 92430

Program Area: Electrical  
Distribution

Title: CEA - TRANSMISSION INFRASTRUCTURE PROTECTION PROJECTS

Contractor:

Cosponsors:

Project Duration: 07/13/07-- 01/09

R&D Engineer: Barna A.

Project Engineer: WARN T.

Objective:

Transmission Infrastructure Protection is a continuing concern that warrants additional research and development in best practices and new products. This funding will enable collaboration with other utilities via the CEA (Canadian Electric Association) on projects to investigate, understand and help solve Transmission Infrastructure Protection Issues.

Benefits:

Enhance our Transmission Infrastructure Protection knowledge base and the deliverables will be a useful tool to aid in the protection of our assets.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$7,500
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

The Project Engineer attended a conference call for the Interest Group members.

Potential project are currently being reviewed by CEA and the Interest Group members.

January, 2008

Cost Segregation Number: 92435

Program Area: Energy & Environmental  
Environmental

Title: DEVELOPMENT OF A "CONSEQUENTIAL" LEARNING SIMULATOR FOR SAFETY IMPROVEMENT

Contractor:

Cosponsors:

Project Duration: 07/20/07-- 07/08

R&D Engineer: Ecock E.

Project Engineer: SPEED C.

Objective:

Improve the trainee's understanding of the consequences of: a) not following procedures properly; b) not wearing appropriate PPE for the job task; and c) not utilizing safety equipment.

Benefits:

The "Consequential" Learning Simulator will benefit all employees that receive the training by improving their awareness of the consequences of error in their work.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$200,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$145,664
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<u>x</u>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

The vendor has submitted a draft of the simulator software for review. Several review cycles are expected before final deployment by end of 2008.

January, 2008

Cost Segregation Number: 92436Program Area: Electrical  
DistributionTitle: CEA - DISTRIBUTION ASSET LIFE CYCLE MANAGEMENT PROJECTSContractor:Cosponsors:Project Duration: 07/31/07-- 03/09R&D Engineer: Barna A.Project Engineer: HONG L.Objective:

Enable collaboration with other utilities via the CEA on projects to investigate and understand distribution life cycle management issues.

Benefits:

Enhance our distribution life cycle management knowledge base and the deliverables have become useful tools to aid in design.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$11,894
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

Technical Status:

Recent projects include:

- Roadmap of customer loads (ConEdisonÆs cost is \$2k of a \$67k project total)
- Worker protection on de-energized distribution lines ( CE cost is \$2k of a \$64k project total)
- Engineering Guide for Distribution Overcurrent Protection (CE cost is \$2k of a \$57k project total)

January, 2008

**Cost Segregation Number:** 92439**Program Area:** Electrical  
Transmission / Planning**Title:** INTERNATIONAL UTILITY WORK GROUP PARTICIPATION**Contractor:****Cosponsors:****Project Duration:** 08/07/07-- 12/09**R&D Engineer:** Duggan P.**Project Engineer:** BERNINGER M.**Objective:**

The International Utility Working Group (IUWG) under the 3G System of the Future Program has a primary goal of benchmarking with dense urban load centers in Europe and the Far East.

**Benefits:**

Immediate goals are to identify new technologies and designs that would support future system designs. This working group has already provided technical design input to our transfer switch plans, aided our discussions with the city on joint tunnel use and business development planning, and continues to evolve to more specific uses. Membership expansion is being pursued to increase our financial and commercial leverage with manufacturers.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$10,466
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

In addition, we are working with EPRI to include US utilities that face similar urban challenges within their service territories in a related working group. The immediate goal is to expand collaborations on new equipment and designs, and through this broader membership leverage manufacturers to pursue development and commercialization of selected devices, technologies and designs based on their own commercial market interests. With broader US participation this forum can serve to assure that common interests of dense urban power systems are supported by regulatory and government agencies, as well as enabled via appropriate regulatory and rate policies and structures. The large number of new and emerging issues such as national interest transmission corridors, energy efficiency, AMI, PHEVs and emission reductions further increase the need for this type of collaboration.

The International Utility Workgroup has been extremely successful up to this point, and has added to our knowledge and plans in areas such as load transfer and system reconfigurations and joint tunnel use. We most recently hosted an International Work Group Meeting in

January, 2008

Cost Segregation Number: 92439

New York City in December of 2007, which reciprocates previous international and US hosting efforts in Paris, Chicago, Tokyo, and Australia. The estimated cost of the conference is approximately \$40,000.

January, 2008

**Cost Segregation Number:** 92440**Program Area:** Electrical  
Distribution**Title:** DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE AND MANHOLE  
EVENTS ANALYSIS - PHASE II**Contractor:****Cosponsors:****Project Duration:** 08/16/07-- 06/08**R&D Engineer:** Lee S.**Project Engineer:** IEROME S.**Objective:**

Con Edison Underground Distribution system consists of approximately 300,000 structures. In 2005, we recorded approximately 230 shock incidents and more than 2,300 manhole events consisting of explosions, tires and smokers. To better design mitigation techniques, we need to identify those factors that are significantly correlated to these events. The ability to identify those structures that are most vulnerable to such events will also help us prioritize and target our spending more effectively. In 2007, Columbia University conducted a Phase 1 study and performed exploratory work on secondary network failure data and the related trouble ticket data. After much data cleanup, a baseline model for the precursor ranking problem has been developed. Additional work in machine learning is required to develop a usable ranked list.

**Benefits:**

Potentially, machine learning can be used to identify factors that are related to manhole and stray voltage events. Better understanding of those factors will help us better design and practice those mitigation techniques that will be most effective.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$493,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$486,296
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	<u>x</u>

**Technical Status:**

This project is complete and the final report has been delivered.  
This project will be closed by the 2nd Qtr. 2008.

January, 2008

Cost Segregation Number: 92445Program Area: Electrical  
DistributionTitle: KNOWLEDGE BASE CAPTURE DEMONSTRATIONContractor: EPRICosponsors:Project Duration: 05/18/06-- 12/09R&D Engineer: Duggan P.Project Engineer: BAGWELL R.**Objective:**

The equipment that is part of the Con Edison infrastructure spans on the order of 100 years. Over that time there have been many changes to many hardware designs and a continuing evolution of technologies. Utility knowledge is in many cases more detailed than that of vendor's because it includes experience not only with the design and fabrication of equipment and systems, but on the interconnected infrastructure's operation, maintenance and failure modes over time, and its interaction with system conditions, abnormal events and environments. This experience base is extremely valuable, particularly with regard to:

- complex devices such as circuit breakers and transformers,
- potential impacts of both the best and problematic practices for installation, operation, testing and maintenance and
- understanding the strengths, weaknesses and susceptibilities of the various vintages of equipment and designs that are part of our electric, gas and steam infrastructures.

In addition this type of valuable experience applies to specialized historical knowledge of specific items like:

- our relationships with our largest customers (e.g. transit authority and NYCDOT Street Lighting) and their most serious needs and concerns
- EMS and Distribution Control Center history and operations,
- Experience with unusual skills such as theft of service enforcement and
- Infrequent evolutions such as plant startups and system restorations

**Benefits:**

Particularly in light of the pending loss through retirement of many of our most experienced personnel, the accelerated pace of technology change and the likelihood of much shorter durations of continuous employment with any one company, developing better ways to capture, document and effectively incorporate our expert knowledge base into training and electronically retrievable reference information is increasingly important to our future as a company.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$81,335
	<u>Budget for the 2008:</u>	\$0

January, 2008

**Cost Segregation Number:** 92445**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_**Technical Status:**

This specific project builds upon work started by EPRI for Nuclear Utilities and recently extended into the Electrical T&D area by EPRI and PSE&G. Con Edison in turn under contracts with EPRI held "train the trainer" sessions to become familiar with the process and software tools involved. Two separate pilot knowledge extraction and documentation efforts have been conducted with EPRI based on priorities established by a very broadly based Steering Committee with System Operations and Customer Services respectively. Based on the success of these efforts further non-R&D rollouts are expected. Further R&D might be considered in the areas of development of new software or web based tools for expansion of selected knowledge extracted to eLearning or "ready reference" retrievable platforms, if this is recommended by the Steering Committee.

Although continuing organization specific knowledge base work in this area is planned to be funded by the Con Edison participant organizations requesting this type of support, this RADPAR can be used in the future to support additional common activities on Knowledge Base, travel attendance at meetings that will further these efforts and/or additional efforts that may be undertaken to institutionalize knowledge for ready reference by multiple organizations.

January, 2008

**Cost Segregation Number:** 92448**Program Area:** Electrical  
Transmission / Planning**Title:** IMPROVED ASSET MANAGEMENT TECHNIQUES**Contractor:** EPRI**Cosponsors:****Project Duration:** 07/30/02-- 06/08**R&D Engineer:** Duggan P.**Project Engineer:** PASQUALE F.**Objective:**

This project builds upon an earlier project which developed an Asset Management Toolkit to create an overall conceptual and functional architecture for asset management across traditional organizational silos. Further development was planned to select portions of this overall roadmap for development as individual software applications that could be interconnected over time to increase their value and effectiveness. Due to personnel changes and reorganizations within EPRI the originally intended project was delayed, and funds have been transferred to other active EPRI projects. Most recently we transferred some of this funding to EPRI project "Optimize Maintenance Through Integrated Monitoring & Diagnostics Circuit Breaker Maintenance Ranking". The ultimate goal of this project is to provide improved maintenance strategies for circuit breakers building upon the strategic and tactical asset management tools specifications for transmission and distribution systems developed under the previous Asset Management Toolkit project. In addition to making use of the best practices for standardized methodologies, business model strategies, data requirements, management and analysis, this effort is intended to integrate these asset management tools in order to maximize synergistic and effective use of related contributing efforts already underway at Con Edison.

**Benefits:**

This program directly supports our Corporate Goal to Develop strategies for meeting customers' and shareholders' needs in an increasingly competitive environment, and, through its successful implementation, would help to maintain the reliability and performance of our generation, transmission and distribution systems, and improve their integrity and efficiency.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$300,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$301,290
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding _	Engineering _	Procurement _
	Implementation <input checked="" type="checkbox"/>	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

EPRI has recently advised that they will be re-integrating their

January, 2008

**Cost Segregation Number:** 92448

Asset Management program, which had been transferred to Power System Asset Management, Planning and Operations (formerly Grid Operations) to better align and integrate it with separate Transmission and Substations and Distribution asset management efforts. The refocusing plans to move away from developing requirements and specs for an overall software tool to extracting the most immediate benefits from sensors and diagnostic technologies being developed at the T&D levels, and building the overall asset management architecture and ultimate software tools by tying these nearer term sensors and diagnostic tools together. Most recently this included the Predictive Reliability & Dynamic Risk project associated with Circuit Breaker Maintenance Ranking. A separate New RADPAR (CSN 92730) has also been issued to better allign with EPRI's refocused effort going forward.

January, 2008

Cost Segregation Number: 92451

Program Area: Electrical  
Transmission / Planning

Title: TRANSMISSION NETWORK VISUALIZATION SYSTEM - TNVS

Contractor: AVS

Cosponsors:

Project Duration: 09/11/02-- 04/08                      R&D Engineer: Wong J.

Project Engineer: MCHUGH P.

Objective:

Implement a visualization system for System Operations bulk power control room using the mimic board as a backbone and integrate with other EMS/Intranet data sources.

Benefits:

Enhance reliability of the transmission network.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$325,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$350,131
	<u>Budget for the 2008:</u>	\$0

Schedule:    Funding \_    Engineering     Procurement \_  
                  Implementation \_    Installation \_    Demo \_    Final Report \_  
                  Closed \_

Technical Status:

System was delivered, installed, and was reviewed. Phase 2 modifications were completed on 12/05. A survey was completed in Feb 2006 for the Bulk Power Control Room operator. We had completed the review with System Operation for next phase development. This project should be closed out in April 2008.

January, 2008

Cost Segregation Number: 92455

Program Area: Electrical  
Substations

Title: PORTABLE SUBSTATION FEEDER DIELECTRIC PRESSURE CALIBRATOR

Contractor: ISLAND TECHNOLOGY

Cosponsors:

Project Duration: 08/08/02-- 04/08

R&D Engineer: Wong J.

Project Engineer: GAUGHAN J.

Objective:

Develop and design a user-friendly portable tool that allows a mechanic to tap into the manifold in a pump house or PURS and be able to manually calibrate the multiple pressure switches and gauges to known standards.

Benefits:

Enhance the reliability of the Transmission network.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$30,728
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	<u>x</u>	Demo	_
	Closed	_			Final Report	_

Technical Status:

Equipment delivered and user evaluation had been completed. This project is scheduled to be closed out in April 2008

January, 2008

**Cost Segregation Number:** 92457**Program Area:** Electrical  
3G System of the Future**Title:** SUBMERSIBLE FAST SWITCH FOR LOAD & CAPACITY TRANSFERS**Contractor:** ONLINE POWER TECHNOLOGIES**Cosponsors:****Project Duration:** 05/17/06-- 12/08**R&D Engineer:** Duggan P.**Project Engineer:** GHAFURIAN R.**Objective:**

The need for a fast switch was identified as part of the System of the Future efforts, and because of the potential size of effort was segregated and issued as a separate RADPAR.

The capability to switch loads between networks and transfer spare capacity between substations is essential to improving the existing asset utilization on the Con Edison system. A compact submersible switch would allow the transfer device to be installed within a vault under city streets, which would allow existing adjacent feeders and ducts to be used to create these transfer capabilities without physically extending both feeders involved in the transfer scheme back to a common location within a substation. A fast transfer capability could support a transfer scheme that would not require "break-before-make" momentary customer interruptions, and thereby would preserve our very high customer perceived reliability.

**Benefits:**

By following this type of partnered design process we assure that this new type of transfer capability will be available to us as soon as possible for use in our already committed substation construction program. This new functionality could also be used to support short term load transfers that could selectively defer otherwise required station upgrades and re-enforcements. Financial risk will be limited by close participation and monitoring of the design and development process by Con Edison personnel and pre-determined technical milestones, specification and test requirements.

The combination of the above capabilities does not exist in any commercially available switches in the ratings we would require. This RADPAR and subsequent RFP continued a dialogue between ourselves and all qualified vendors to allow us to:  
identify the technically achievable 13kV Fast Switch designs, quantify the associated costs to develop one or more designs meeting as many of our desired requirements as possible (as well as the cost savings they would enable in future designs), provide sufficient incentive to accelerate design, development and (if judged to be achievable) final demonstration and deployment.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$2,250,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$130,569
	<b><u>Budget for the 2008:</u></b>	\$750,000

January, 2008

**Cost Segregation Number:** 92457**Schedule:** Funding \_ Engineering **x** Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_**Technical Status:**

Based on the evaluations performed under an RFP to multiple vendors we are continuing work with On Line Power Technologies to develop a 13kV submersible switch to support make-before break load transfers. If successful this design would be deployed as a means to transfer selected loads between stations to reduce load on a network during feeder contingencies. Once completed this design, as well as other vendor designs will be re-evaluated to identify the feasibility and best available designs to increase this functionality to higher capacity applications such as larger load blocks and or the capacity of spare transformer.

As additional aspects of this same project we are are working on: a 27kV Fast Switch, a planned demonstration of this device in Westchester and submersible control boxes to support the original 13kV submersible switches.

January, 2008

**Cost Segregation Number:** 92458**Program Area:** Electrical  
Distribution**Title:** DEMONSTRATION OF PRECISE WEATHER FORECASTING FOR CON EDISON  
OPERATIONS**Contractor:** IBM GLOBAL SYSTEMS, COLUMBIA UNIVERSITY**Cosponsors:****Project Duration:** 06/06/06-- 12/08**R&D Engineer:** Carbonara J.**Project Engineer:** JOHNSON J.**Objective:**

Investigate the applicability of more precise weather forecasting capability by utilizing finer resolution forecasting models in conjunction with several local stand-alone weather stations.

**Benefits:**

Deployment of the Deep Thunder model technology with its mesonet (a network of local weather monitoring stations) capability would produce more precise and accurate weather information that would potentially enable near-real-time assessment of current weather conditions. The Deep Thunder model will be accessed by Transmission and Distribution planning personnel to provide better load forecasts for day-ahead scheduling that can result from integration with currently used forecasts. In addition, the model can provide thunderstorm alerts for specific networks to the MECC and BQCC managers. If successful, the resulting benefits will include better dispatch of personnel during weather related emergencies, reduced outages, and improved system reliability.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$140,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$139,585
	<b><u>Budget for the 2008:</u></b>	\$50,000

<b><u>Schedule:</u></b>	Funding	<input type="checkbox"/>	Engineering	<input checked="" type="checkbox"/>	Procurement	<input type="checkbox"/>
	Implementation	<input type="checkbox"/>	Installation	<input type="checkbox"/>	Demo	<input type="checkbox"/>
	Closed	<input type="checkbox"/>			Final Report	<input type="checkbox"/>

**Technical Status:**

We contracted with IBM to allow Con Edison to have access to IBM's Deep Thunder model technology with its localized weather forecast services. A preliminary assessment of Deep Thunder forecast accuracy was completed comparing historical forecasts with observed weather data. The results were mixed with Deep Thunder storm results being 50% on timing, 50% on location and 30% on path predictions. The temperature forecast was, aside from some outliers, fairly accurate. We also surveyed company's facilities through out our service area to identify candidate sites for placing weather data monitoring stations. Columbia University and Lamont Doherty Lab personell assisted in this effort and provided the weather station design and specification. We identified six location spread out in Con Edison

January, 2008

**Cost Segregation Number:** 92458

and O&R areas. These stations, once installed, will be used to verify Deep Thunder local weather predictions along with other weather data metrics. Two weather stations were installed during 2007. One at the Staten Island Victory Blvd Service yard and the other at the Buchanan Substation in Westchester. Additional stations are planned for 2008. We also introduced Deep Thunder model to the corporate Emergency Management group. Under a separate R&D project, Emergency Management is integrating the Deep Thunder forecasts into our Bronx/Westchester storm mobilization decision model.

January, 2008

Cost Segregation Number: 92480Program Area: Electrical  
CustomersTitle: DEMONSTRATION OF MOBILE COMMUNUCATION AND TRACKING FOR  
VEHICLEContractor: UTILITY ASSOCIATESCosponsors:Project Duration: 06/30/06-- 06/08R&D Engineer: Carbonara J.Project Engineer: HERBERT R.Objective:

Looking for opportunities to identify and to remove inefficiencies in work processes.

Benefits:

Use communication and vehicle tracking systems for our vehicles would enhance the operation and performance of our Electric Operations business area.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$145,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$92,966
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

Technical Status:

This project is being done in support of the CALM project team of Electric Operations who are looking at opportunities to identify and to remove inefficiencies in work processes using computer-based technologies. They identified the management of Vactor (flush) trucks as an area to be assessed and researched. To research this area, we proposed to instrument flush trucks in B/Q with GPS units that can send a stream of location data to a central server. We can then use mapping software coupled with data from the dispatchers that manage the requests for trucks to track the vehicles and to determine whether there is really an opportunity to improve operations through improved flush truck operations scheduling. Our goal is to determine what (if any) increase in productivity can be achieved for flush truck crews. This will require research into how to link the vehicle onboard GPS tracking system with operational data computers using dynamic programming and optimization algorithm software.

This first pilot demonstration that we initiated uses the Utility Associates AVail OnComm GPS unit. The OnComm Unit provides for on-board computing and communications to allow vehicle tracking and navigation via GPS, secure broadband connectivity, RFID capabilities for reporting mission-critical information about equipment and

January, 2008

**Cost Segregation Number:** 92480

personnel in the field, and onboard vehicle diagnostics via the vehicle's OBDII/CAN to monitor mileage, oil pressure, RPM, emissions, trouble codes, and other diagnostic information.

Completed the installation of Avail OnComm GPS based vehicle tracking and dispatching system for Vactor and Cable vehicles in two Con Edison operations areas: Brooklyn/Queens and Bronx/Westchester. The new GPS system allows Supervisors to optimally dispatch vactor/cable trucks with greater efficiencies and productivity realized. After the installation of GPS systems, Bronx/Westchester Environmental reported GPS units have reduced the traveling time for the vehicles and improved dispatching ability through the use of the system's visualization tool. During the first 4 months of 2007 showed an increase in productivity in that an extra 514 structures were cleaned as a result of the GPS initiative. The new vehicle tracking system introduced by this R&D projects was selected by our Information Resource Department as the company standard for its entire vehicle tracking applications.

January, 2008

**Cost Segregation Number:** 92482**Program Area:** Electrical  
Distribution**Title:** INTEGRATED COMMUNICATIONS STRATEGY - PHASE I**Contractor:** KEMA**Cosponsors:****Project Duration:** 09/05/07-- 03/08**R&D Engineer:** Barna A.**Project Engineer:** FROST T.**Objective:**

Con Edison is undertaking several business initiatives for improving the effectiveness, reliability, and outage recovery of the distribution system. These initiatives include. But are not limited to: AMI deployment, RMSx demonstration, high tension vault monitoring, secondary networks monitoring, 3G, substation automation, etc. These and other related programs need to be adequately supported by enabling communications systems that are reliable and cost effective. This is a corporate-wide initiative with the objective to develop a long range strategy related to communications in our business. We plan to hire a consulting firm to help us develop this strategy. This project will be structured into a series of complimentary and comprehensive tasks that will yield a roadmap of networks, development, and target designs, cost/benefit estimates and implementation plans. Phase I of the project will target business requirements and forecast, market and technology analysis, business case, and support for the rare case.

**Benefits:**

Integrated Communications Strategy would support many business initiatives by enabling reliable and cost effective communications systems. These initiatives are designed to improve the reliability of our distribution system. Communications strategy can potentially eliminate certain capital and O&M costs associated with implementation separate communications system for each of the business initiative.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$20,518
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

This project is in progress. KEMA interviewed various departments for the purpose of this project.

January, 2008

**Cost Segregation Number:** 92484**Program Area:** Electrical  
3G System of the Future**Title:** 3G SOF CONCEPT DEMONSTRATION IN STATEN ISLAND PHASE 1**Contractor:** S&C**Cosponsors:****Project Duration:** 06/21/06-- 12/08**R&D Engineer:** Lee S.**Project Engineer:** EAGLETON S.**Objective:**

The capability to transfer spare capacity between substations is essential to improving the existing asset utilization on the Con Edison system. On the present 33 kV system in Staten Island, five remotely operable switches are available for load transfer operations. To ensure that this is accomplished safely and efficiently, a system needs to be in place for modeling, monitoring and remotely controlling the load transfer operation.

**Benefits:**

This project will demonstrate the 3G SoF concept of sharing resources and improving asset utilization on the Con Edison system. The demonstration will serve as a test bed for implementing this concept in other areas of the Con Edison system.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$145,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$60,054
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

This project will demonstrate the 3G SoF concept of sharing resources and improving asset utilization on the Staten Island 33 kV system. The demonstration will be implemented in three phases. The first phase, addressed in this RADPAR, will focus on the development of sensor and monitoring to the existing 33 kV SCADA-MATE switches that will allow the remotely controllable load transfer to occur safely and reliably. To date, phase angle sensing has been installed at Fresh Kills and Fox Hills for phase angle monitoring between the two substations.

The development of the sensing and remotely operated capability of the SCADA-MATE switches was completed. The package has been installed on one of the five tied switches between Fresh Kills and Fox Hills substation allowing its remote operation from Davis Avenue.

January, 2008

Cost Segregation Number: 92487

Program Area: Electrical  
Distribution

Title: NEXT GENERATION PLATFORM TO LEVERAGE POWER SYSTEM DATA

Contractor:

Cosponsors:

Project Duration: 09/18/07-- 12/09

R&D Engineer: Doherty F.

Project Engineer: DIMITRIU C.

Objective:

Via multi-member EPRI tailored collaboration develop additional PQ software to further leverage value of power system data.

Benefits:

Broader integration and use of data from intelligent electrical devices leading to enhanced reliability.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$50,000
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

The collaborative group is meeting and developing application requirements.

January, 2008

Cost Segregation Number: 92494

Program Area: Electrical  
Substations

Title: WESTCHESTER SOUTH SUBSTATION VISUALIZATION SYSTEM

Contractor:

Cosponsors:

Project Duration: 09/24/07-- 12/09

R&D Engineer: Wong J.

Project Engineer: MURPHY J.

Objective:

Develop a visualization tool to allow the Dunwoodie 345 South and North Control Room and the 138 kV control room to have access to real-time Bulk Power Transmission network information.

Benefits:

Reduce engineers analysis time and effort.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$31,008
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

We are currently working with the user to develop the visualization scope and system development work will begin in April 2008

January, 2008

**Cost Segregation Number:** 92608**Program Area:** Electrical  
Transmission / Planning**Title:** TRANSMISSION PROBABILISTIC RISK ASSESSMENT (PRA)**Contractor:** EPRI; THE RISK RESEARCH GROUP, INC.**Cosponsors:****Project Duration:** 04/09/03-- 06/08**R&D Engineer:** Duggan P.**Project Engineer:** KOTECHA V.**Objective:**

The project provides funding for a number of elements including: funding for Transmission PRA model development and enhancement work being performed by Dr. Allen of The Risk Research Group, Inc . Continued Improvements in quantitative methods to measure and model Transmission Reliability are required to support operating, maintenance, design and economic decisions in the current more complicated regulatory environment. Although substantial progress has been made in the development and use of metrics and modeling for distribution systems, direct measures of customer interruptions are less meaningful in evaluating the transmission system because of the redundancy of transmission assets and their interactions with generation asset availabilities. Transmission "success" can also be impacted by complex effects beyond just the adequacy of supply versus load including the ability to control power flows with PARs, voltage support and VAR support with the use of generators, transformers, capacitors and shunt reactors at both the system and individual transmission substation levels. Additionally, data required to support transmission reliability modeling at the component level is much less commodity driven, and requires extensive interpretation to reflect complexity of devices, equipment maintenance, repair and/or replacement, vendor and vintage differences, as well as equipment histories of load duty cycles, external environmental conditions and through fault experience. This added complexity impacts both the model development, and the work required to transfer from model development, into a process that assures the reliability model continues to reflect current system and equipment configurations.

**Benefits:**

The project objective is to continue to develop a Con Edison specific Transmission System model, which can be used to support design decisions, perational decisions, including outage planning and scheduling and as measuring tool to balance economics and reliability. Con Edison participation in the CIM Standards for Planning project that has been initiated within EPRI. While it will most directly support efforts to make the POM and PRA software CIM and IEC-61850 compatible for direct Transmission Planning use, it will lay the groundwork for many other future efforts such as: Developing protocols and interfaces for System of The Future distribution monitoring and control Linking transmission planning

January, 2008

**Cost Segregation Number:** 92608

models and the Transmission PRA model and model sharing (similar to LIPA's successful effort) with the future ECC EMS system. Increasing our knowledge and understanding of CIM, UCA, IEC-61850 and IEC-6970 and their inter-relationships. Better understanding the features and capabilities of the new IEC-61850 compatible station automation systems, such as that purchased for Mott Haven. Although we had not until recently used UCA in Con Edison substation applications, this technology is being extensively used by others in new Control Center EMSs, and most recently in LIPA's MMW-CIM-UIB EMS system architecture, and follow on planned advanced distribution automation implementation, and Central Engineering has advised that IEC-61850 will be used in the Mott Haven Transmission Automation design.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$500,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$475,988
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

LIPA has successfully implemented an EMS replacement that integrates Maintenance Management Workstation (MMW) and CIM in order to facilitate model sharing and business process use of EMS related information, and migration of this architecture to substation applications. This application now allows LIPA to share models from EMS moments in time, and make them immediately available in PSSE and other formats for modification and use in System Planning Models. This type of functionality is a key element to enable more effective use of our own Transmission Planning PRA Model by eliminating burdensome and time consuming set up time for PRA case studies. CIM and related IEC Standards information have been distributed to all potentially effected organizations within Con Edison and O&R to obtain maximum synergy from any potential benefits, and to obtain Con Edison input and comments from all potentially effected areas of our Company. Organizations with interest in following developments in this technology include System Planning, Distribution Engineering, Equipment and Field Engineering, Control System Engineering and System Operations.

continuing user support and maintenance for the EPRI PRA program. This program is a key supporting element of the Con Edison Transmission PRA model being developed and used by Transmission Planning, and funds user directed enhancements to facilitate the functionality and use of this software. Since this support extends beyond the first year use of this software 50% of the funding will be provided directly by Transmission Planning (account B3070) with another 50% covered by R&D via EPRI TC Allocation based on the Continued development and enhancement work on this software that is being directed by Con Edison and other utilities' participation in this EPRI user group.

In the future, some of the aspects of this current RADPAR will be continued under a new separate expanded RADPAR (CSN 92622) Transmission PRA and Wide Area Measurement Systems (WAMS) Applications.

January, 2008

Cost Segregation Number: 92622

Program Area: Electrical  
Transmission / Planning

Title: TRANSMISSION PRA AND WAMS APPLICATIONS

Contractor:

Cosponsors:

Project Duration: 10/09/07-- 12/09

R&D Engineer: Duggan P.

Project Engineer: KOENIG M.

**Objective:**

Continued Improvements in quantitative methods to measure and model Transmission Reliability are required to support operating, maintenance, design and economic decisions in the current more complicated regulatory environment. This is particularly true with NERC's new role as the Electric Reliability Organization (ERO), the advent of NERC Reliability Standards and increasing discussions regarding the development of transmission reliability metrics. It is anticipated that the existing Con Edison Transmission PRA model will require additional enhancements and developments to interface more easily with the new EMS System, deal with new reliability standards and requirements and in the longer term to make more effective use of new applications being developed to make more effective use of phasor deployments and future wide area control enhancements. Although substantial progress has been made in the development and use of metrics and modeling for distribution systems, direct measures of customer interruptions are less meaningful in evaluating the transmission system because of the redundancy of transmission assets and their interactions with generation asset availabilities. Transmission "success" can also be impacted by complex effects beyond just the adequacy of supply versus load including the ability to control power flows with PARs, voltage support and VAR support with the use of generators, transformers, capacitors and shunt reactors at both the system and individual transmission substation levels. Additionally, data required to support transmission reliability modeling at the component level is much less commodity driven, and requires extensive interpretation to reflect complexity of devices, equipment maintenance, repair and/or replacement, vendor and vintage differences, as well as equipment histories of load duty cycles, external environmental conditions and through fault experience. This added complexity impacts both the model development, and the work required to transfer from model development, into a process that assures the reliability model continues to reflect current system and equipment configurations.

**Benefits:**

The project objective is to continue to develop a Con Edison specific Transmission System model, which can be used to support design decisions, operational decisions, including outage planning and scheduling and as measuring tool to balance economics and reliability.

R&D Project Status Report

January, 2008

Cost Segregation Number: 92622

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$20,000
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

The project will support selective continuation of Transmission PRA enhancements by the Risk Research Group, Inc. plus future WAMS applications; the first of which will be separate EPRI project PRA Research for NYPA, LIPA & Con Edison directed at reducing the likelihood of cascading outages.

January, 2008

Cost Segregation Number: 92627

Program Area: Electric Vehicles  
Electric Vehicles

Title: ELECTRIC VEHICLE TESTING AND MONITORING

Contractor:

Cosponsors:

Project Duration: 10/16/07-- 12/08

R&D Engineer: Barna A.

Project Engineer: JACK K.

Objective:

To explore the steps needed to help integrate EV's into our distribution system.

Benefits:

Study findings are expected to help aid in a more comprehensive strategy for the potential of electric vehicles.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$17,556
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

A test protocol was designed and implemented for two Miles Electric Vehicles that Con Edison purchased. Driver data input devices and vehicle GPS monitoring devices were purchased and are currently under test.

Power consumption monitors were purchased and implemented. Power Quality studies were conducted at Con Edison headquarters (4 Irving Place) and Con Edison's Astoria facility.

January, 2008

Cost Segregation Number: 92649

Program Area: Administration/Industry Group  
Administration

Title: PATENT SEARCHES IN CONNECTION WITH COMPANY R&D TECHNOLOGY  
APPLI

Contractor:

Cosponsors:

Project Duration: 05/17/93-- Continuing R&D Engineer: O'Sullivan R.

Project Engineer: O'SULLIVAN R.

Objective:

Fund that part of the Company's patent search fees associated with products of R&D program.

Benefits:

Royalty-free use of new technologies resulting in reduced O&M costs.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$647,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$685,787
	<u>Budget for the 2008:</u>	\$23,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

N/A

January, 2008

Cost Segregation Number: 92656C08

Program Area: Electrical  
Distribution

Title: SOLAR PANELS FOR STREETLIGHTS - DEMONSTRATION

Contractor: SOL INC.

Cosponsors:

Project Duration: 08/10/06-- 06/08

R&D Engineer: Barna A.

Project Engineer: MAZZANI J.

**Objective:**

We seek to use solar powered streetlights as a long term, but temporary solution until the DOT rebuilds the roadway or bus pad, or until the 18-month protected street status expires.

**Benefits:**

Solar streetlights will help the Company to avoid the following costs:

- Replacement of concrete bus pads at \$80,000.00 each
- Mill and pave costs of protected streets at \$300,000.00 per street, and \$150,000.00 per intersection.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$7,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$0
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering \_ Procurement \_  
 Implementation \_ Installation \_ Demo \_ Final Report \_  
 Closed **x**

**Technical Status:**

One set of solar panels for one streetlight has been acquired for testing.

This project has been completed and will be closed out by the 2nd Qtr. of 2008.

January, 2008

**Cost Segregation Number:** 92660**Program Area:** Electrical  
Transmission / Planning**Title:** REAL-TIME RELAY PROTECTION AUTOMATED FAULT ANALYSIS SYSTEM**Contractor:****Cosponsors:****Project Duration:** 10/17/07-- 11/09**R&D Engineer:** Wong J.**Project Engineer:** RAMIACHAN R.**Objective:**

Current Fault analysis for transmission and distribution systems automatic operations are performed manually by protection engineers. While this detailed analysis is still required to maintain reliability, it does not address Systems Operations's need for a summary analysis within minutes following occurrence of the disturbance. We had demonstrated in Phase 2 of this project the high accuracy of the fault locating algorithm, and that it is feasible to setup a production mode real-time monitoring system for selected feeders which are equipped with Digital Fault Recorder (DFR). The next step will be to implement an automated system to trigger the fault locating and present fault location results to system operation within 5 minutes.

**Benefits:**

1. By identifying the faulted feeders in a multiple-tripout event, enable system operators to restore transmission system to a more secure state quicker.
2. By accurately locating the fault, permit Transmission Operations to start feeder repair quicker.
3. For transient overhead fault, permit definite fault location in the absence of physical evidence.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$270,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$269,994
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

We had completed the server-side installation of the fault locating algorithm. The next step is to setup a program interface between the production mode notifications for System Operation. Validation will begin Summer of 2008.

January, 2008

Cost Segregation Number: 92667

Program Area: Electrical  
Distribution

Title: STRAY VOLTAGE MITIGATION PROGRAM EVALUATION

Contractor:

Cosponsors:

Project Duration: 12/20/06-- 12/08      R&D Engineer: Lee S.

Project Engineer: VARELA-MALONEY

Objective:

In this project, the Risk Research Group will use statistical analysis on data collected over the past two years to evaluate the stray voltage mitigation program. The study will predict the likelihood of stray voltage events in any structure and evaluate the cost benefits of remedial actions. Programs or combination of programs which will best mitigate the stray voltage problem will be identified.

Benefits:

Better understanding of the techniques that best mitigate stray voltage will help us develop the optimum stray voltage mitigation strategies for risk reduction and ensure public safety.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$39,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$16,000
	<u>Budget for the 2008:</u>	\$0

Schedule:    Funding \_    Engineering     Procurement \_  
                  Implementation \_    Installation \_    Demo \_    Final Report \_  
                  Closed \_

Technical Status:

A probability model to predict the frequency with which stray voltage and Electric Shock reports (ESRs) will be encountered has been developed and the parameters used have been estimated from historical stray voltage and ESR data.

January, 2008

Cost Segregation Number: 92669Program Area: Electrical  
Transmission / PlanningTitle: WIDE AREA REAL-TIME FREQUENCY VISUALIZATIONContractor:Cosponsors:Project Duration: 10/25/07-- 09/08R&D Engineer: Wong J.Project Engineer: FU A.Objective:

One of the recommendations to prevent cascading outages of power system is to improve operator's situation awareness. Although any PMUs have been installed in the Eastern Interconnection, the potential benefits of real time PMU measurements have not been fully utilized due to the lack of visualization and control applications using PMUs. Operators need to know what is happening at their neighboring systems in order to improve their situational awareness. When a major event occurs in an interconnected power system, such as multiple generator outages, it will be very important and beneficial for the power system operators or regional reliability coordinators to know the estimated location, the magnitude and the type of the event in real-time such that they will be able to work together to take appropriate and coordinated control actions to handle the outages. In current EMS, although there are various types of EMS applications and displays, advanced visualization applications are not yet available to fully utilize the available EMS data to provide GIS based visualization application for improving operators' wide area situational awareness and to take the appropriate preventive or corrective control actions. More R&D effort is required in these areas.

Benefits:

The software will inform operator, almost immediately, of rapid changes in frequency, over the entire interconnection among the different control areas providing ample time for preparing strategies to avoid the potential shutdown of the system.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$95,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$60,000
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

Technical Status:

EPRI had completed the preliminary program for wide area frequency and PMU contour display. The next phase is to setup a demo for off-line Con Edison's case.

January, 2008

**Cost Segregation Number:** 92670**Program Area:** Electrical  
Transmission / Planning**Title:** TRANSMISSION SYSTEM CASCADING OUTAGES VISUALIZATION**Contractor:****Cosponsors:****Project Duration:** 10/25/07-- 09/08**R&D Engineer:** Wong J.**Project Engineer:** SANDOVAL R.**Objective:**

The cascading electrical outage that occurred on August 14, 2003 caused a wide-area electric power transmission grid blackout and affected an estimated 10 million people in Ontario (about one-third of the population of Canada), and 40 million people in eight U.S. states (about one-seventh of the population of the U.S.). Outage-related financial losses were estimated at around \$6 billion USD. Analyses of this blackout (the largest in North American history) have concluded that system operators likely could have mitigated the extent and damage of the blackout if they would have had access to real-time software tools that could have identified the impending crisis and provided operators with easy-to-interpret data needed to make timely, informed decisions.

**Benefits:**

The main benefit of this initiative is reliability enhancements of our transmission system. Potential benefits expected from this pilot demonstration include: significant reduction in the operation and maintenance costs during normal and emergency conditions, greater flexibility in the Company's strategic options; effective resource allocations, and increased customer satisfaction.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$95,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$45,000
	<b><u>Budget for the 2008:</u></b>	\$100,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The vendor is currently working on the EPRI POM portion. Once complete, we will setup the boundary visualization and add the additional OPM tool.

January, 2008

**Cost Segregation Number:** 92676**Program Area:** Electrical  
Distribution**Title:** EVALUATION OF DISTRIBUTION SYSTEM HARMONIC CURRENTS AND THEIR  
EFFECT ON GROUND CURRENTS**Contractor:** EPRI SOLUTIONS**Cosponsors:****Project Duration:** 09/23/03-- 06/08**R&D Engineer:** Doherty F.**Project Engineer:** HONG L.**Objective:**

We have experienced increasing neutral current on distribution circuits, and power quality monitors indicate that the harmonic content of this neutral current is significant. Excessive neutral currents can cause relays to misoperate leading to outages, since 3rd harmonics appear in substation neutrals. Ground currents can also cause touch potential problems and customer issues. Other concerns include potential overloading of grounding transformers or substation and distribution transformers.

**Benefits:**

This project will develop opportunities to minimize operational problems through improved design and operating practices, and via a better understanding of specific solutions available when problems are encountered. Participation in the EPRI/PEAC collaboration will also help guide standards for consumer projects towards mitigating harmonics at the source.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$176,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$116,375
	<b><u>Budget for the 2008:</u></b>	-\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	<b>x</b>

**Technical Status:**

EPRI solutions was engaged to characterize harmonic levels and sources of harmonics due to residential loads; evaluate Con Edison system characteristics, suggest mitigation steps. Draft report has been received.

January, 2008

**Cost Segregation Number:** 92711**Program Area:** Electrical  
3G System of the Future**Title:** INTEGRATED SYSTEM MODEL (ISM) VALIDATION USING DEW FOR 3G  
SYSTEM OF THE FUTURE DESIGN**Contractor:** EDD**Cosponsors:****Project Duration:** 09/07/06-- 06/08**R&D Engineer:** Lee S.**Project Engineer:** GHAFURIAN R.**Objective:**

The electric power delivery system for Con Edison's service territory as it is designed today will not meet the needs of a growing load in an increasingly dense urban environment. The 3G System of the Future Project (SOF) is currently developing the infrastructure designs that will have the flexibility to accommodate many future scenarios while enhancing robustness of the energy delivery to our consumer. One challenge is to develop the computational tools that will drive the system towards operational optimization. Future buildouts must be modeled and analyzed to fully understand the implications of the new electrical architecture, improve system intelligence and increase efficiency and reliability over time.

**Benefits:**

This integrated system model will be used to help design the 3G SOF designs and evaluate their reliabilities. The model will also help us assess what additional instrumentation we need to install in the network to monitor and optimize the system design.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$425,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$423,190
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	<input type="checkbox"/>	Engineering	<input checked="" type="checkbox"/>	Procurement	<input type="checkbox"/>
	Implementation	<input type="checkbox"/>	Installation	<input type="checkbox"/>	Demo	<input type="checkbox"/>
	Closed	<input type="checkbox"/>			Final Report	<input type="checkbox"/>

**Technical Status:**

3G SOF designs must be modeled and tested on the computer first, with consequences evaluated before actions are taken. Under another R&D project (CSN 92347 - 3G SOF Independent Reliability Assessment of Hudson Yard Load Transfer Design), a model of the Hudson Yard proposed design will be built by using the DEW (Distribution Engineering Workstation) software. Using the software, the reliability of the 3G designs will be compared with the existing system. In this project, Engineering is seeking to validate the DEW software for accuracy in loadflow and reliability analysis. An integrated system model including the transmission, substation and distribution down to the customer will be modeled for the Sutton Network. EDD

January, 2008

Cost Segregation Number: 92711

(Electrical Distribution Design, Inc), DEW developer, will work with Engineering to compare and evaluate both power flow and reliability analysis against existing tools.

The Sutton network prototype model has been completed. This project will be closed in the 2nd Qtr. 2008.

January, 2008

**Cost Segregation Number:** 92715C08**Program Area:** Electrical  
Metering**Title:** AMR/AMI BUSINESS CASE-CONSULTANT**Contractor:** KEMA**Cosponsors:****Project Duration:** 10/12/06-- 06/08**R&D Engineer:** Barna A.**Project Engineer:** WOOD A.**Objective:**

To respond to an order from the New York State Public Service Commission (PSC), dated August 1, 2006. the order requires utilities to develop a plan for evaluating, and/or implementing advanced metering for all customer classes û with business cases to be deployed for each situation. The order also requires utilities to consider trials for meter/systems that enable time-sensitive rates, energy management and other such opportunities.

**Benefits:**

This study will identify AMI technologies that can improve the following: (a) Automated Meter Reading, (b) Time-sensitive Rate structure, (c) Enhanced customer Service, (d) Load study and Load flow analysis (g) Load forecasting, (h) Demand side management (i) Gas system benefits

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$497,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$237,422
	<b><u>Budget for the 2008:</u></b>	\$100,000

**Schedule:** Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed **x**

**Technical Status:**

A purchase order was issued to a consultant firm in November 2006. the consultant has performed a detailed business case analysis with evaluation of various AMI technologies applicable to Con Edison system. An AMI model has been developed. The vendor is currently preparing the final report and PSC filing. This report was filed with the PSC and this project is to be closed out 2Q 2008 .

January, 2008

**Cost Segregation Number:** 92716**Program Area:** Electrical  
Distribution**Title:** DEGRADATION OF SECONDARY CABLE AS RELATED TO STRAY VOLTAGE AND  
MANHOLE EVENTS**Contractor:** ELECTRICAL INSULATION RESEARCH CENTER, UNIV. OF CONNECTIC**Cosponsors:****Project Duration:** 09/29/06-- 06/08**R&D Engineer:** Barna A.**Project Engineer:** CHOE W.**Objective:**

Characterize failure mechanisms for most common secondary cable construction types by performing mechanical, electrical, and other experiments.

**Benefits:**

The tools provided will be used to depict the conditions necessary for the cable to deteriorate and ultimately fail. This information can then be used to possibly locate the deteriorated cables before they fail.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$290,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$90,975
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

UCONN continues to investigate the phenomena which are clearly relevant to the decomposition of cable jacket/dielectric which leads to manhole explosions by using thermo gravimetric analysis (TGA) and a residual gas analyzer (RGA), to study the rate of gas generation and the gas composition which results from anaerobic and aerobic thermal decomposition of the cable jacket/dielectric.

In the latest update UCONN discusses the thermal decomposition of cable insulation in a confined space, which simulates the duct environment based on measurements using TGA and RGA configured to sample from atmospheric pressure.

Through the TTGA and RGA experiment UCONN has gained an understanding of the thermal decomposition characteristics for secondary cable cross sections (jacket plus dielectric).

UCONN has been able to quantify the gas composition rate and rate of generation, as a function of temperature.

R&D Project Status Report

Exhibit\_(NJ-1)  
Page 169 of 208

January, 2008

Cost Segregation Number: 92717

Program Area: Electrical  
Distribution

Title: EFFECTS OF VOLTAGE REDUCTION ON ELECTRICAL EQUIPMENT USING  
ELECTRONIC CONTROL - LITERATURE SEARCH

Contractor: POLYTECHNIC UNIVERSITY

Cosponsors:

Project Duration: 10/05/06-- 06/08

R&D Engineer: Lee S.

Project Engineer: KEVELSON M.

Objective:

Investigate the effects on load equipment that utilizes electronic control as a result of voltage reduction.

Benefits:

Improved understanding of how voltage reduction affects customer equipment will help Con Edison to make better operating decisions.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$49,875
	<u>Spent To Date (as of 12/31/2007):</u>	\$38,873
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report **x**  
Closed \_

Technical Status:

A draft report has been issued for this project and it is currently under review.

This project is complete and the final report has been provided.  
This project will be closed during the 2nd Qtr. 2008.

January, 2008

Cost Segregation Number: 92718

Program Area: Electrical  
Distribution

Title: CHARACTERIZATION OF ARCING FAULT SIGNATURE

Contractor:

Cosponsors:

Project Duration: 10/06/06-- 06/08

R&D Engineer: Lee S.

Project Engineer: JONES C.

Objective:

In this project, we will employ TESS of Texas A&M University to review the data collected in relation to the arcing fault project. TESS will use their extensive experience in characterization of arcing faults to prepare a list of recommendations for further work.

Benefits:

Advanced knowledge of arcing fault conditions will enable us to respond quickly averting hazardous situations and limiting damage to system equipment and potentially preventing incidents and public exposure to hazards caused by arcing fault events.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$35,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$27,546
	<u>Budget for the 2008:</u>	\$0

<u>Schedule:</u>	Funding	_	Engineering	_	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	<b>x</b>

Technical Status:

This project is complete and the final report has been issued. This project will be closed in the 1st Qtr. 2008.

January, 2008

**Cost Segregation Number:** 92730**Program Area:** Electrical  
Transmission / Planning**Title:** CONDITION BASED MONITORING FOR CKT BKRS, XFMRs & OTHER  
SUBSTATION EQUIPMENT**Contractor:****Cosponsors:****Project Duration:** 11/20/07-- 12/10**R&D Engineer:** Duggan P.**Project Engineer:** CHU D.**Objective:**

This RADPAR will fund specific projects suggested by EPRI, equipment vendors or others to test, validate or evaluate monitoring equipment and sensors that are being considered for broader deployment as part of an overall asset management strategy, as well as to assess condition based monitoring data as input to maintenance and replacement plans and programmatic asset management strategies.

**Benefits:**

Con Edison has been modifying existing maintenance strategies and moving to sensor-enabled, condition-based maintenance in order to meet the simultaneous needs of reducing costs and increasing reliability. The main goal of condition based monitoring is to identify impending maintenance needs and/or failures and to take equipment out of service before it fails. This avoids in service failures, which in some cases can lead to ancillary damage or degraded conditions of additional equipment, and can have much greater operational, reliability and economic consequences, because these unplanned failures may occur at peak periods, which typically involve higher stresses on the power system and associated substation equipment.

In addition on-line condition based monitoring allows equipment specialists to track and trend anomalous conditions between otherwise similar equipment for earlier investigation at pre-planned outages. It also provides valuable input on individual and similar equipment performance over time, as well as baseline data that can be used to assess changes in equipment condition throughout its life, and immediately following through faults, overloads, temperature extremes or other conditions, which could effect equipment performance or degrade equipment life.

Information gained will be shared with EPRI and other utilities in an effort to develop improved methods to manage assets and avoid in service failures.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$250,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$80,000
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	<input type="checkbox"/>	Engineering	<input checked="" type="checkbox"/>	Procurement	<input type="checkbox"/>
	Implementation	<input type="checkbox"/>	Installation	<input type="checkbox"/>	Demo	<input type="checkbox"/>
					Final Report	<input type="checkbox"/>

January, 2008

Cost Segregation Number: 92730

Closed \_

**Technical Status:**

As the first step of improved condition based monitoring for circuit breaker, transformers and other substation equipment Con Edison plans to participate with EPRI in MIS (Metal Insulated Semi-conductor) Sensor Field Trials to monitor the performance accuracy and long term life of low cost sensors for combustible gases that could be deployed in power or distribution transformers. Initial deployment for trial purposes in power transformers that already have more expensive versions of gas-in-oil on line monitoring, will allow direct validation of these new sensors.

January, 2008

**Cost Segregation Number:** 92735**Program Area:** Electrical  
Distribution**Title:** STRAY VOLTAGE SENSOR FOR TRANSFORMER VAULT GRATINGS**Contractor:****Cosponsors:****Project Duration:** 10/06/06-- 12/08**R&D Engineer:** Lee S.**Project Engineer:** CHOE W.**Objective:**

Presence of stray voltages on our secondary distribution structures poses a significant threat to public safety. At present there are no monitoring system for stray voltages on our structures. A sensor for stray voltage must be designed to provide isolation from voltages within the comparative and communication device modules. This is necessary to ensure that no voltages are introduced on the gratings causing undesirable hazards to pedestrians. Development of a system that can endure the harsh environment in our service territory presents a unique challenge.

**Benefits:**

Ensuring that any stray voltage conditions are reported and mitigated in a timely manner will ensure public safety. Testing and field trials will provide assurance that such a system is feasible before wide deployment.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$21,948
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

Newly developed stray voltage sensors were installed at network transformer vault for testing. The sensors detect stray voltage and communicate information via the remote monitoring system. These new sensors provide isolation from voltages within the comparative and communication device modules to ensure that no voltages are introduced on the gratings causing undesirable hazards to pedestrians.

A second generation sensor is currently under development.

January, 2008

Cost Segregation Number: 92739

Program Area: Electrical  
Transmission / Planning

Title: PARTIAL DISCHARGE MONITORING FEASIBILITY STUDY FOR 138KV XLPE  
CABLE IN PIPE

Contractor: IMCORP

Cosponsors:

Project Duration: 03/29/04-- 04/08

R&D Engineer: Wong J.

Project Engineer: GHAFURIAN R.

Objective:

To develop and install a two-sensor PD system to demonstrate a proof of concept for a high voltage transmission cable while under normal operation. This system will also allow for highly accurate and effective off-line testing to be performed during outage.

Benefits:

Provide real time monitoring of the status of the 138 Kv solid dielectric cables that are installed in steel pipes in our transmission system and detect incipient failures. The main benefit is improved reliability of the transmission system.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$56,601
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Demo completed on June 2005. The result of this work had been applied to the commissioning test of Cedar St 138 kV XLPE cabling system. This project is scheduled to be closed out in April 2008.

January, 2008

**Cost Segregation Number:** 92741**Program Area:** Electrical  
3G System of the Future**Title:** SYSTEM OF THE FUTURE (FORMERLY FUTURE SUBSTATION DESIGN)**Contractor:** ALTRAN, GRIDWISE ALLIANCE**Cosponsors:****Project Duration:** 04/07/04-- 06/08**R&D Engineer:** Duggan P.**Project Engineer:** FOGARTY R.**Objective:**

The Substation of the Future RADPAR was originally established for miscellaneous support needs of the Substation of the Future Team, when it was first created, as a separate entity from the 3G Team. Although the two separate Teams established working liaisons cross-participation early in their joint existence, the original focus of the Substation of the Future Team was more focused on new substation configurations that could meet improved asset utilization, shared spares and reduced cost goals and the survey of potentially available new technologies that could help in that effort.

**Benefits:**

The goal of the 3G-System of the Future project is to use equipment and technologies as they become available to meet increased load demands and life extension needs using less equipment with better asset utilization, shared spare capability and much more diagnostic and smart switching capability to more effectively and efficiently operate our own equipment, as well as exploit synergies and benefits that may emerge from coordination with DSM as spinning reserve, Building HVAC and facilities control, advanced metering, customer portals and distributed resources.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$500,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$374,424
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The first and continuing cost under this RADPAR has been Con Edison participation in the GridWide Alliance (which operates under a formal Memorandum of Understanding with the DOE and focuses on interoperability. It includes very broad stakeholder participation, including major users of electricity, distributed generation developers and appliance manufacturers focused on improved grid reliability and reduced costs through application of digital information and control technologies across the entire grid. A decision over the last year by DOE that their own internal GridWorks effort (under System Integration now very recently re-named

January, 2008

**Cost Segregation Number:** 92741

Engineered Systems and Power Electronics) would focus solely on hardware, and GridWise (originally under Distributed Resources now very recently spread across Visualization and Controls, Distributed Generation and Distribution) would be responsible for digital information and controls across the entire grid, including Transmission. We expect that the increased emphasis on the use of phasor monitoring across separate control areas and grid monitoring (assigned by FERC as NERC's first task as the new overall reliability entity) will be even further emphasized in the overall DOE Visualization and Controls scope. A separate component of the original "gridwise" scope already emphasizes the use of large loads and large numbers of appliances (enabled via a Pacific Northwest National Labs developed chip) as spinning reserve.

We have received multiple benefits from this close working relationship with DOE including participation as the lead utility partner in INFOTILITY's DOE funded local agent based control software effort, which we plan to coordinate with our own "Sense and Respond" Team effort, DOE funding of the 2nd generation 69kV ETO-based Solid State Current Limiter development work with EPRI, and close ties with the Superconductivity community through our participation at all DOE Peer Reviews (Transmission, Distribution and Superconductivity) and our separate membership in the Coalition for Commercial Application of Superconductors.

In addition this RADPAR has been used to fund support by Altran Solutions to the original Substation of the Future Team, which included extremely effective logistical support through Altran's foreign affiliates to establish relationships, formulate and complete detailed technical question surveys of dense urban utilities including London EDF, Paris EDF, Rome-Turin. TEPCO and KANSAI and a final Report, which served to help establish a similar relationship and ongoing information exchange with these utilities, ComEd and other utilities like Australia Energy that has been solidified through a series of Urban Utility Workshops hosted by Con Edison, Paris EDF and now planned for TEPCO, where their work on underground substations and shared utility tunnels is of particular interest.

This RADPAR has also been used to fund small pilot projects of selected new technologies, including, installation of severon battery monitoring, purchase of a Premium Power Zinc Bromide battery and purchase of 5 Plug Power Fuel Cells for use as battery service profile extenders to mitigate the large increases in substation battery loads due to IEDs and equipment LANs.

January, 2008

Cost Segregation Number: 92743

Program Area: Electrical  
Customers

Title: E-SOURCE TECHNOLOGY ASSESSMENT AND ENERGY EFFICIENCY PROGRAM  
SERVICES

Contractor: E-SOURCE

Cosponsors:

Project Duration: 11/27/07-- 12/09

R&D Engineer: Carbonara J.

Project Engineer: CARBONARA J.

Objective:

To be competitive and responsive to our customers, we need a source of independent analysis, strategic insights and indepth assessment related to retail energy markets, services and technologies, particulady in the areas of energy efficiency, distributed resources, storage technologies, and other emerging technologies. This appropriation provides funding for access to emerging energy related technologies that can be used by Con Edison's R&D, Energy Services and Energy Efficiency personnel as a basis for technology development, demonstration, and deployment to improve our overall system and operation.

Benefits:

Our participation in the E-Source Energy Service will allow company personnel to gain access to a source of independent analysis, strategic insights and indepth assessments related to retail energy and energy efficiency markets, services and technologies.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$150,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$25,310
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

We are participating in E-Source Emerging Technologies and Energy Efficiency Services. We have limited our participation for 6 months in 2008. At the end of this 6 month period, we will determine whether or not to continue the service for 2008 and 2009.

January, 2008

Cost Segregation Number: 92747

Program Area: Electrical  
Distribution

Title: ADVANCED CUSTOMER COMMUNICATIONS TECHNOLOGY (ACCT)

Contractor: POWELL

Cosponsors:

Project Duration: 07/08/96-- 06/08

R&D Engineer: Carbonara J.

Project Engineer: FARRELLY D.

Objective:

Develop, design, and demonstrate an advanced load limiting/disconnecting meter collar for residential meter applications

Benefits:

Potential benefits include improved system reliability, labor productivity, and revenue protections.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$3,300,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$2,787,349
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation  Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

Advanced Load Limiting/Disconnecting Switch for Residential Customers (Powell). A prototype produced by Powell was successfully demonstrated in October. Minor modifications to the unit were performed. A formal demonstration was held on February 12, 2003. Meter Shop, Customer Operations and R&D personnel attended the meeting. The demonstration was successful and Meter Shops is proceeding with acceptance testing. R&D will support a trial quantity for field evaluation, if the meter passes the acceptance tests. The Meter Shop continues to perform acceptance testing on the units. However, they have encountered delays with testing the Powell Disconnect device due to waiting for delivery of power supply board from Powell. The testing completed and the results are under evaluation. A report on the test results was prepared by the meter shop staff shop. The Powell units did not meet the revenue meter requirements of the Meter Shop and were sent back to the manufacturer. Other type of AMR communication technology are also under evaluation under this project. These include satellite, Power Line Carrier and Cellular communications technologies. Also, an ongoing field demonstration of CDPD based communication AMR for Transit accounts was conducted in 2005. We don't expect any further ongoing development for this project. The objectives of this project were met and all deliverables for this project were received. This project will be closed out in the next reporting period.

January, 2008

**Cost Segregation Number:** 92748**Program Area:** Electrical  
Customers**Title:** CALM ANALYSIS DEMONSTRATION FOR IMPROVED REPLEVIN PROCESS**Contractor:** CALM ELECTRIC**Cosponsors:****Project Duration:** 12/06/07-- 06/08**R&D Engineer:** Carbonara J.**Project Engineer:** SEGUR R.**Objective:**

Con Edison's Customer Services is always striving to improve the quality of its service and efficiency of its operations. Certain Customer Operations processes lend themselves to potential improvements with the application of computer-aided technology. One business area that stands out is the Replevin Law Process that impacts uncollectibles. This business area is a complex operation requiring extensive interaction with Law other company departments. The work is labor and paper intensive and involves the Company directly interfacing with customers. One computer technology that could assist in maximizing the performance of the Replevin Law Process is the methodologies of Computer-Aided Lean Management (CALM) analysis. CALM analysis, with its ability to provide an automated way to track actions, measure performance, and rigorously adjust the actions to improve future performance, has the potential of affecting significant improvements in the Replevin area. This demonstration will determine the effectiveness of CALM analysis to the Replevin business area in Customer Operations

**Benefits:**

This project, if successful, represents an excellent opportunity to improve the interface between Customer Operations and other company departments and our customers, as well as interfacing with NYC courts for electronic filing of data in the near future Application of CALM methodologies may result in greater efficiencies and reduced costs through reductions in paperwork, operational costs, and legal costs. In addition, optimization of the Replevin Law process has the potential to improve customer goodwill and further reduce Con Edison's costs and potential losses associated with customers not paying their electric bills.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$185,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$110,000
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	<input type="checkbox"/>	Engineering	<input checked="" type="checkbox"/>	Procurement	<input type="checkbox"/>
	Implementation	<input type="checkbox"/>	Installation	<input type="checkbox"/>	Demo	<input type="checkbox"/>
	Closed	<input type="checkbox"/>			Final Report	<input type="checkbox"/>
		<input type="checkbox"/>				<input type="checkbox"/>

**Technical Status:**

Completed a demonstration of the application of CALM methodologies

January, 2008

**Cost Segregation Number:** 92748

to the Customer Operations Replevin Law process which resulted in identified greater efficiencies and reduced costs through reductions in paperwork, operational costs, and legal costs. In addition, optimization of the Replevin Law process will improve customer goodwill and further reduce Con Edison's costs and potential losses associated with customers not paying their electric bills.

The new system will reduce the Replevin cycle time from 120 - 300 days to approximately 55 days which will reduce our uncollectibles and O&M expenses. In addition, we will print approximately 1.5 million fewer pages annually which result in a reduced possibility of documents being misplaced, as well as being environmentally friendly. The system will also create a way to track jobs in progress and therefore create better quality control.

The Customer Operations Replevin group anticipates reducing one bill on average from all accounts that go through this process. This would be a savings of approximately \$2 Million annually in reduced uncollectibles and outstanding receivables. In addition to the reduction in uncollectibles, the new system will allow for the flexibility to change the process flow, depending on the current business environment, and continue to track performance. It will also create reporting capabilities that allow for forecasting and trending.

January, 2008

**Cost Segregation Number:** 92754**Program Area:** Electrical  
Customers**Title:** EPRI ASSESSMENT OF ENERGY EFFICIENT POWER SUPPLIES**Contractor:** EPRI**Cosponsors:****Project Duration:** 12/19/07-- 12/08**R&D Engineer:** Carbonara J.**Project Engineer:** THOMPSON D.**Objective:**

Con Edison is a participating member of the Electric Power Research Institute (EPRI) Energy Efficiency program. Under this program, Con Edison and EPRI are collaborating on research and development to improve the efficiency and integration of electricity delivery systems and the end-use equipment in homes, offices, and factories. When energy efficiency is augmented with demand response and load management, it is one of the most cost effective means of addressing higher fuel costs, growing load demand, and reducing greenhouse gas emissions. What is needed is a better understanding of how some of the new state of the art technologies, such as the highly efficient 80 PLUS computer power supplies, may fit into the long range solution to Con Edison's objectives for energy saving opportunities.

**Benefits:**

The expected benefits include energy (kwh) savings due to higher efficiency power supplies, reduction in peak load and CO2 footprint, as well as possible positive impacts on circuit harmonics and power factor. Project results will allow Con Edison personnel to make more informed recommendations to our customers when requests for accurate information about energy savings products and technologies come in from those customers.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$350,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$175,000
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

The funding for this project was authorized and an agreement was put in place with EPRI that provided the tasks and related activities to demonstrate the value of energy efficient power supplies. We met with EPRI in Knoxville to begin project discussion and to observe bench top testing of 80Plus power supplies. A meeting and workshop between EPRI and the Con Edison Energy Efficiency group and R&D is being planned for early 2008.

January, 2008

**Cost Segregation Number:** 92756**Program Area:** Electrical  
Transmission / Planning**Title:** X28 LEAK DETECTION SYSTEM**Contractor:****Cosponsors:****Project Duration:** 11/15/06-- 10/08**R&D Engineer:** Wong J.**Project Engineer:** SANTINI A.**Objective:**

The objective of this project is to field test a new algorithm that uses a regression analysis to predict the mass needed to effectuate a complete fill for Natural Gas Vehicle (NGV) fuel tanks. The new algorithm is intended to correct a problem with underfilling of NGV fuel tanks caused by rise in temperature in a cylinder as the vehicle fills. This phenomena, known as the heat of compression, may result in system underfills in the range of 20 to 25 percent for pneumatic control systems and 10 to 15 percent underfills for newer electronic control systems.

**Benefits:**

Con Edison benefits because fewer man-hours will be spent refueling vehicles if refueling frequency can be reduced by up to 25% through the use of this new algorithm. In addition, increased confidence in the use of NGVs results because their effective range will be increased by up to 25%. External benefits include increased satisfaction on the part of NGV taxi owners because effective range of their vehicles will be increased and vehicle down time may be reduced.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$120,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$90,100
	<b><u>Budget for the 2008:</u></b>	\$25,000

<b><u>Schedule:</u></b>	Funding _	Engineering <input checked="" type="checkbox"/>	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report _

**Technical Status:**

The system was successful to detect the first leak in Dec 2007. More validation testing will be setup throughout the summer of 2008 to confirm the accuracy of the leak detection system.

January, 2008

**Cost Segregation Number:** 92758**Program Area:** Electrical  
Distribution**Title:** IMPROVED EARLY DETECTION OF URBAN STRAY VOLTAGE CONDITIONS**Contractor:****Cosponsors:****Project Duration:** 12/24/07-- 08/09**R&D Engineer:** Doherty F.**Project Engineer:** CHOE W.**Objective:**

Stray voltages present a hazard to people or animals that may come into contact with an energized surface. There exist more than 730,000 underground and overhead electrical structures and street lights in the company franchise area and we need to develop suitable hardware and analytical tools to advance the state-of-the-art in detecting pre-cursor events that ultimately result in inadvertent energization, and providedirectional capabilities for detection of energized objects where overhead power lines may interfere with existing early detection methods.

**Benefits:**

This project will evaluate advanced technology and its suitability for the intended application; and provide a design specification for follow-on commercial product development effort. If successful, this will permit improved discovery and repair of these anomalies thereby improving safety to our customers and increasing the quality of life in our service area.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$250,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$105,500
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	_	Procurement	_		
	Implementation	<input checked="" type="checkbox"/>	Installation	_	Demo	_	Final Report	_
	Closed	_						

**Technical Status:**

We have engaged EPRI and they have begun work including field observation in Brooklyn and analysis of collected data.

January, 2008

**Cost Segregation Number:** 92759**Program Area:** Electrical  
Distribution**Title:** CURRENT LIMITING CONDUCTORS FOR THE 4KV PRIMARY GRID -  
FEASIBILITY STUDY**Contractor:** GEORGIA TECH**Cosponsors:****Project Duration:** 12/06/06-- 12/08**R&D Engineer:** Lee S.**Project Engineer:** CHEBLI E.**Objective:**

Installation of the USA (Unit Substation Automation) system has enabled us to accurately monitor the flow of power on our Unit Substation transformers and 4 kV network distribution system. Under contingency conditions, such as the loss of a unit substation, some of the 4 kV feeders or other unit substations may experience overloads even though there is still sufficient capacity in the grid. Analysis of the data showed that MW and MVAR flows are less than optimal resulting in poor power factors. This condition can lead to overloading of unit substation transformers requiring them to be replaced at substantial costs.

**Benefits:**

A final report will be written including the findings of this project and presenting details of the impact that this technology could have on the 4 kV primary grid system operations and reliability.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$75,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$132,147
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

The Intelligent Power Infrastructure Consortium (IPIC) at the Georgia Institute of Technology has proposed the use of distributed series impedance (DSI) modules that can be clamped on to existing transmission or sub-transmission lines and can be controlled to change the impedance of the line, and thus the current flowing on the line. The proposed DSI system would be implemented using passive inductors or capacitors with electromechanical or thyristor ac switches, embedded inside modules that float, both electrically and mechanically, on the power line. Multiple modules would operate together to realize an overall system control function. Each module functions in a 'passive' manner, operating with information that it can measure locally, but collectively achieving a system level control function. The concept of a simple implementation of a Current Limiting

January, 2008

**Cost Segregation Number:** 92759

Conductor (CLIC) has been investigated, that could increase line impedance by switching in series inductance as the line approached thermal overload. This would then divert current to other lightly loaded parts of the network, increasing system capacity.

This project will explore the possibility of using DSI modules on the 4 kV primary grid, including a preliminary design concept and a cost/benefit analysis.

A model of the proposed scheme has been developed. Cost / benefit analysis are currently being completed.

January, 2008

Cost Segregation Number: 92772

Program Area: Electrical  
Distribution

Title: SECONDARY FAULT LOCATER

Contractor: THE VON CORPORATION

Cosponsors:

Project Duration: 12/06/06-- 06/08

R&D Engineer: Barna A.

Project Engineer: D'AQUILA J.

Objective:

We seek to work with The Von Corporation to develop two sheath/ground fault locator prototypes for evaluation on Staten Island fault sites. After review and approval of prototypes by Staten-Island Construction, The Von Corporation will deliver 2-3 production units for demonstration under field use on secondary URD cables.

Benefits:

Development of a fault locator for secondary URD cables will speed up the troubleshooting of faulty URD mains, leading to reduced customer restoration time.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$35,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$31,500
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

Technical Status:

This project is complete. It will be closed out by the end of 2Q of 2008.

January, 2008

Cost Segregation Number: 92774

Program Area: Electrical  
Distribution

Title: FIREPROOF COATING DEVELOPMENT FOR ARC TAPE

Contractor:

Cosponsors:

Project Duration: 12/13/06-- 06/08

R&D Engineer: Doherty F.

Project Engineer: MURRAY G.

Objective:

Explore the practicality of enhancing arc proof tape with a fire retardent.

Benefits:

Reduced collateral damage to facilites in manholes that experience burnouts and thereby improved reliability.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$50,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$28,527
	<u>Budget for the 2008:</u>	\$0

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report **x**  
Closed \_

Technical Status:

Product was developed via iterative trials. It is now available for general use. This project will be closed out.

January, 2008

Cost Segregation Number: 92775

Program Area: Energy & Environmental  
Environmental

Title: HUMAN FACTORS STUDY

Contractor:

Cosponsors:

Project Duration: 12/12/06-- 04/08

R&D Engineer: Ecock E.

Project Engineer: PEVERLY F.

**Objective:**

The number of OSHA recordable injuries in BronxM/estchester Electric Operations have increased over the last three years. In an effort to reverse the trend of these incidents, a different approach is sought that will investigate the human factors contribution to these accidents, and that will provide recommendations to improve the current safety practices.

**Benefits:**

The primary benefit that will result from this project will be the increased level of safety for our electric construction workers. Our project goal is to learn and understand more about the relationship of human factors in the cause of accidents, and to initiate changes in safety practices and procedures that will improve safety.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$75,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$48,971
	<b><u>Budget for the 2008:</u></b>	\$10,000

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

The consultant will be making a presentation of its findings in March, 2008.

January, 2008

**Cost Segregation Number:** 92778**Program Area:** Electrical  
Distribution**Title:** FAULT ANALYSIS ON DISTRIBUTION NETWORKS HAVING STATIC  
CONVERTER SYSTEMS**Contractor:****Cosponsors:****Project Duration:** 12/20/06-- 12/08**R&D Engineer:** Lee S.**Project Engineer:** SAMMON D.**Objective:**

Distributed Generation (DG) is predicted to play an increasing role in the electric power system of the near future. Existing distribution systems were designed to operate without any generation on the network itself or at the customer sites. The introduction of generation sources on the distribution system can significantly impact the flow of power and voltage conditions at customer and utility equipment. It is critical that the power system impacts be assessed accurately so that these DG units can be applied in a manner that avoids degradation of service, such as power quality, reliability, and control of the utility system.

**Benefits:**

In this project, a computer simulation code for a lumped secondary network that utilizes static-converter/synchronous-generator sets will be developed. This code can be utilized in the future for analysis of similar systems on the network. Laboratory experiments will also be conducted to validate the theoretical predictions. An interface guide will be developed for connection to static-converter/synchronous-generator sets.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$148,500
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$44,394
	<b><u>Budget for the 2008:</u></b>	\$0

**Schedule:** Funding \_ Engineering  Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed \_

**Technical Status:**

We are presently working on implementing the complete model on MATLAB. The DC-Link model provided by the manufacturer has already been incorporated. Network protectors are presently being added to the model on the secondary of each network transformer.

January, 2008

**Cost Segregation Number:** 92779**Program Area:** Electrical  
Distribution**Title:** SCADA IMPLEMENTATION ON NETWORK SUBMERSIBLE SWITCHES**Contractor:****Cosponsors:****Project Duration:** 09/27/06-- 12/08**R&D Engineer:** Lee S.**Project Engineer:** STERGIOU P.**Objective:**

Network submersible switches are applied on the distribution network feeders to isolate faults allowing the operator to expedite the restoration of the unfaulted feeder sections. Various studies performed by Distribution Engineering have suggested that use of these switches during network contingencies greatly improves the reliability of the network system and reduces the likelihood of network jeopardy. These switches have been deployed at many locations on the Con Edison's system, however currently, operation of these switches requires manual intervention causing delays in the restoration process. Such delay could contribute significantly to the likelihood of cascading failures during severe contingencies in the network.

**Benefits:**

Having the ability to remotely operate a network submersible switch eliminates the requirement to dispatch a field crew. Use of SCADA will reduce restoration time significantly which is critical when the network is under severe contingencies.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$270,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$176,889
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

At present the two locations (Brooklyn and Queens) are fully equip with the main components of the SCADA package. The analog temperature and pressure sensors have been tested and will be installed shortly. The pole-top repeaters were sent to the vendors and are currently being modified to include a feature to monitor the AC power supply to the unit. The vendor is also adding a function to test the battery in the repeater. Design of the iGIN Manager user interface is complete. A demo is being scheduled for early April.

January, 2008

**Cost Segregation Number:** 92787**Program Area:** Electrical  
Transmission / Planning**Title:** IMPROVED LBMP MARKET SIMULATION MODEL**Contractor:****Cosponsors:****Project Duration:** 01/02/07-- 12/08**R&D Engineer:** Duggan P.**Project Engineer:** JAGGI N.**Objective:**

Capturing outages are particularly important when forecasting New York City Day Ahead Market (DAM) Locational Based Marginal Pricing (LBMP), given the high load and transmission constraints. It is difficult to efficiently adjust for all plant and transmission outages using the Bid Stack Model currently employed by Energy Management. Further, the model does not emulate the New York ISO's LBMP algorithm in a timely manner. This makes pricing forecasts less accurate. In addition, the existing system only partially supports the complex decision process that involves information retrieval, alternative comparisons and strategy development. "What If" analysis capabilities would greatly facilitate confidence in decision making impacted by multiple factors. However with the current Bid Stack Model, this is not viable due to the manual-intensive iteration, and the limited time available to factor in the effects of various relevant factors on market behavior.

**Benefits:**

Improved market simulation tools will help us react in a more informed and timely to changes of demand and supply conditions in our power supply area. It will also provide an additional tool for Electricity Supply in planning and executing financial hedging targets and valuation.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$150,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$113,319
	<b><u>Budget for the 2008:</u></b>	\$50,000

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

A purchase order was issued to a consultant firm in November 2006. The consultant has performed a detailed business case analysis with evaluation of various AMI technologies applicable to Con Edison system. An AMI model has been developed. The vendor is currently preparing the final report and PSC filing. This report was filed with the PSC and this project is to be closed out 2Q 2008.

January, 2008

**Cost Segregation Number:** 92789**Program Area:** Electrical  
Distribution**Title:** PARTIAL DISCHARGE DIAGNOSTICS FOR SEPARABLE CONNECTORS -  
FEASIBILITY STUDY**Contractor:** UNIVERSITY OF CONNECTICUT**Cosponsors:****Project Duration:** 01/05/07-- 06/08**R&D Engineer:** Barna A.**Project Engineer:** HOFMANN P.**Objective:**

On May 5, 2006, a Distribution Splicer received burns to his right leg and other minor burns. He was splicing primary cable in a disconne manhole structure when an "H-type" disconnect failed in that manhole. From the available evidence the most likely initiating event was electrical tracking on the 6-phase, load-side connecting plug. Detection of precursor conditions, such as partial discharge, could allow splicers to evaluate equipment before entering a manhole.

**Benefits:**

This study will explore if precursor conditions, such as partial discharge, precede operating failures of separable connectors. The study will also explore if such conditions can be detected. The goal of this work is to ultimately develop a tool that splicers can use to avoid entering structures with certain precursor conditions.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$75,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$66,688
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding _	Engineering _	Procurement _
	Implementation _	Installation _	Demo _
	Closed _		Final Report <b>x</b>

**Technical Status:**

Final report is being prepared by UCONN. This project is to be closed out by 2Q of 2008

January, 2008

**Cost Segregation Number:** 92793**Program Area:** Electrical  
Distribution**Title:** HOUSE SHUNT TRANSFORMER**Contractor:****Cosponsors:****Project Duration:** 12/21/06-- 06/08**R&D Engineer:** Carbonara J.**Project Engineer:** MAZZANI J.**Objective:**

Provide the capability for 240 volt power to be supplied from a single 120 volt phase or from a service with an open neutral (and two good phases). Engineer and construct 30 prototype units in accordance with the requirements of Underwriters Laboratories.

**Benefits:**

The major benefit is the positive impact that the project will have on Customer Satisfaction. It will also provide a public safety benefit when the units are used during summer periods when elderly and other sensitive customers may be subjected to conditions of high temperature and humidity.

<b><u>Financial:</u></b>	<b><u>Authorization / Appropriation Amount:</u></b>	\$40,000
	<b><u>Spent To Date (as of 12/31/2007):</u></b>	\$19,865
	<b><u>Budget for the 2008:</u></b>	\$0

<b><u>Schedule:</u></b>	Funding	_	Engineering	<input checked="" type="checkbox"/>	Procurement	_
	Implementation	_	Installation	_	Demo	_
	Closed	_			Final Report	_

**Technical Status:**

Completed the design and construction of 30 preproduction House Shunt Transformers to allow full 240 volt service to be immediately restored to the customer using a single 120/240 volt step-up auto transformer until a permanent repair can be scheduled. The units represent a significant cost and size advantage over commercially available units. The major benefit is the positive impact that the project will have on Customer Satisfaction. It will also provide a public safety benefit when the units are used during summer periods when elderly and other sensitive customers may be subjected to conditions of high temperature and humidity. A patent application for the new design was filed.

January, 2008

Cost Segregation Number: 92794Program Area: Electrical  
DistributionTitle: REAL TIME FAULT LOCATION SYSTEMContractor: TECHNOLOGY ENHANCEMENT COCosponsors:Project Duration: 11/19/96-- 12/08R&D Engineer: Doherty F.Project Engineer: HONG L.Objective:

Develop and demonstrate a real time fault locating system.

Benefits:

Improve reliability by reducing the time a feeder is out of service. Reduce fault locating costs. Reduce high voltage thumping and its resultant potential cable damage, thus reducing cable failures.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$1,550,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$1,096,778
	<u>Budget for the 2008:</u>	\$50,000

<u>Schedule:</u>	Funding _	Engineering _	Procurement _	
	Implementation _	Installation _	Demo <input checked="" type="checkbox"/>	Final Report _
	Closed _			

Technical Status:

The first field trial was completed on June 5, 2000 using a staged fault. Work proceeded with creation of feeder models and the database of wave patterns, and the vendor extended the functionality of the off-line system and established the hardware and software requirements for migration to real-time mode. While the system was a technical success, communication needed for the system developed on this project remains both an insurmountable technical and financial hurdle for its deployment. In the wake of closeout of the IWP contract, with Distribution Engineering and Manhattan we developed a substitute. This method uses Power Quality Nodes and interfaces to host an algorithm called "reactance to fault" (RTF) that expedites fault locating on our distribution feeders. When this program was used (predominantly in Manhattan in 2006), fault-locating times averaged about a half hour less than last year's average of over 2 hours. This program is continuing to be rolled out with remaining substations in Westchester and Staten Island to be equipped in 2008.

January, 2008

Cost Segregation Number: 92795C08

Program Area: Electrical  
Substations

Title: INDICATION OF FEEDER CONDITION

Contractor: PHENIX

Cosponsors:

Project Duration: 01/22/07-- 06/08

R&D Engineer: Barna A.

Project Engineer: COZZI R.

Objective:

The objective is to develop an alarm system to sense when the condition was disrupted. We are working with HVTS manufacturers to find ways to notify operators when the condition was lost. We plan to demonstrate a paging system in several substations. This system would send a signal to the operator's pager when the condition is interrupted.

Benefits:

Reduction of feeder processing times.

<u>Financial:</u>	<u>Authorization / Appropriation Amount:</u>	\$40,000
	<u>Spent To Date (as of 12/31/2007):</u>	\$33,302
	<u>Budget for the 2008:</u>	\$50,000

Schedule: Funding \_ Engineering \_ Procurement \_  
Implementation \_ Installation \_ Demo \_ Final Report \_  
Closed **x**

Technical Status:

To be closed out 2Q 2008 pending final report.



Company Name: Con Edison  
Case Description:  
Case: 08-E-0539

Response to DPS Interrogatories – Set DPS14  
Date of Response: 06/27/2008  
Responding Witness: Arthur Kressner

Question No. :206

Subject: Research, Development, and Demonstration - 1. For all items that are co-funded in Exhibit\_(AK-1), provide the following for the three rate years: a. name of the other parties who will provide funding; b. amount of funding each party will provide; and c. how the funding will be allocated toward the program.

Response:

The following two projects, identified in the exhibit\_ (AK-1), have significant co-funding. The costs shown are totals for the three year rate plan and is not an annual amount.

1) Superconducting and Solid State Fault Current Limiter program (Project Hydra) – Con Edison is both a co-funder (not the lead) and a subcontractor on this project. The prime contractor (to the USDHS) is American Superconductor. The funding detailed below is as presently envisioned, but is subject to change.

USDHS	\$25 million
Con Edison	\$6.0 million
NYSERDA	\$1.0 million
EPRI (under discussion at this time)	\$3.0 million (to partially offset Con Edison costs)

These funds will be allocated to pay the prime contractor. Some of Con Edison's contributions will be in the form of in-kind direct labor and equipment costs associated with construction of the demonstration site(s).

2) Interoperability of Demand Response Resources Demonstration in NY. Con Edison is the primary contractor with USDOE on this project. The funding for each party is how it is presently envisioned; however, negotiations with USDOE are underway and the final amounts for each party may change.

US DOE	\$6.2 million
NYSERDA	\$1.0 million
Verizon and other private partners	\$6.2 million
Con Edison	\$0.6 million

These funds will be allocated to pay the Verizon and other private partners for their direct costs. Con Edison cost sharing is for in house labor charges that will be utilized on this project.

In addition to the two projects listed above, Con Edison also provides funding to collaborative R&D organizations such as EPRI, CEATI and NEETRAC. These organizations undertake collaborative research projects, for the benefit of various partners, which may range from few to many depending on the individual project undertaken. This provides significant leveraging of our research dollars. There are several items shown in Exhibit\_(AK-1) that are for such collaborative projects. These include EPRI base program, EPRI's Dynamic Energy Management Initiative, CEATI Power Delivery Projects, NETRAC application research for Distribution, EPRI's Plug-in electric vehicle project, EPRI Assessment of energy efficient power supplies and EPRI Energy efficient and demand response project. We also fund several research subscription services, such as E-Source, Cambridge Energy Resources Association (CERA), North American Electric Power Advisory Services, Energy Insight and Northeastern University Center for Energy Education. These collaborative services provide us up to-date, focused information on technologies under development at other organizations. The costs for these programs are shown in the response to Staff 205.

Company Name: Con Edison  
Case Description:  
Case: 08-E-0539

Response to DPS Interrogatories – Set DPS14  
Date of Response: 06/27/2008  
Responding Witness: Arthur Kressner

Question No. :207

Subject: Research, Development, and Demonstration - 1. For all items listed under Exhibit\_ (AK-1), provide the budgeted funding and the spending to date for the past five rate years (including 2008 rate year).

Response:

The financial data requested has been included in the attached Excel spreadsheet which was prepared in response to DPS-205.

Company Name: Con Edison  
Case Description:  
Case: 08-E-0539

Response to DPS Interrogatories – Set DPS14  
Date of Response: 06/27/2008  
Responding Witness: Arthur Kressner

Question No. :208

Subject: Research, Development, and Demonstration - 1. With the understanding that R&D projects might extend beyond schedule, provide a list of estimated programs that are planned for production and would result in credits to the R&D budget for the 2008, 2009, 2010, and 2011 rate years.

Response:

The following projects might result in products that can be capitalized. In order to be capitalized, these projects would need to be successfully completed and the hardware has to be deemed as “used and useful” by the operating group. If not deemed “used and useful,” the project cannot be capitalized. This is our best guess as to a list of potential projects that could be capitalized. Please note that this is the earliest date that the project could be capitalized and that date is affected by the actual end date of the project and the date of the operating group deems it “used and useful.” The best-guess projects are :

- Fault current limiter - 2011 at the earliest
- New SF6 Leak Camera - 2010
- GIC Monitors - 2009
- Submersible Fast Switch - 2009 or 2010
- Darwin Zero –Crossing Switch - 2010
- Applied Mesh Secondary Monitoring and High Tension Monitoring wireless data gateways - 2009 or 2010
- New Improved Vactor Flush Truck - 2010
- PHEV infrastructure (Metering and Charging) Stations- 2011 at the earliest

It should also be noted that not all of the R&D development and demonstration costs of a project would be credited to the R&D budget. Only the cost associated with the hardware or software that goes into final production mode is considered for capitalization. The costs of development and prototype units remains charged to the R&D account.

Also, as noted above, R&D does not independently make the determination of what is capitalized. R&D submits documentation of the associated costs along with a written statement from the operating organization that has accepted this hardware or software deeming it to be “used and useful” to the Company’s Plant Accounting group, which makes the decision as to whether or not to capitalize the equipment.

Company Name: Con Edison

Case Description:

Case: 08-E-0539

Response to DPS Interrogatories – Set DPS45

Date of Response: 08/26/2008

Responding Witness: Kressner

Question No. :593

Subject: Research, Development, and Demonstration – Follow-up to DPS-205 - Follow-up to DPS-205. Regarding the attached excel spreadsheet provided in response to DPS-205 titled “DPS-205 response 6-17-08 rev2”: 1. Define the column labeled Radpar Date. 2. Is the Actual Spending and Estimates column by rate year or by calendar year? 3. What is the difference between 2008 Budget column and 2008 column under Estimates? 4. What is the procedure for handling projects that exceed the amount authorized? 5. For current transformer disconnect device program under CNS 92015, the spreadsheet shows \$126,000 for total spent to date thru April 2008, while 2008 Project Status Sheet shows \$252,000 spent to date as of 12-31-07. Which value is correct? 6. For EPRI’s dynamic energy management (energy efficiency initiative) program under CNS 92003, the spreadsheet shows \$0 for 2008 Budget, while 2008 Project Status Sheet shows \$270,000 for 2008 budget. Which value is correct? 7. Besides the differences mentioned in part 5 and 6 of this question, provide confirmation that both the spreadsheet and the 2008 Project Status Sheet represent the correct values. If not, provide an updated version with changes identified in response.

Response:

1. Define the column labeled Radpar Date.

Response: Radpar date means the date the project was authorized and the funding was appropriated. Radpar stands for Research and Development Project Appropriation Request.

2. Is the Actual Spending and Estimates column by rate year or by calendar year?

Response: The spending and estimates are by calendar year.

3. What is the difference between 2008 Budget column and 2008 column under Estimates?

Response: The budget column is what we anticipated spending on the various projects when the 2008 budget was put together in the third quarter of 2007. The estimate is an updated estimate of what the project spending will be in 2008 based upon the current status of the project.

4. What is the procedure for handling projects that exceed the amount authorized?

Response: Corporate Policy for R&D projects allows for funding to exceed the amount authorized by 20% up to \$150,000. If the funding is above those limits the RADPAR is supplemented using the normal procedures.

5. For current transformer disconnect device program under CNS 92015, the spreadsheet shows \$126,000 for total spent to date thru April 2008, while 2008 Project Status Sheet shows \$252,000 spent to date as of 12-31-07. Which value is correct?

Response: The project spending was \$126,000. In December 2007 both the operating department and R&D placed an accrual on this project for work completed in 2007. This mistake was corrected in January 2008.

6. For EPRI's dynamic energy management (energy efficiency initiative) program under CNS 92003, the spreadsheet shows \$0 for 2008 Budget, while 2008 Project Status Sheet shows \$270,000 for 2008 budget. Which value is correct?

Response: The status sheets were prepared in March 2008 using the budget that was included in the 2007 rate case. However the budget was revised to reflect what was actually approved by the Commission in April 2008. Therefore the spreadsheet is correct, based upon the new rates.

7. Besides the differences mentioned in part 5 and 6 of this question, provide confirmation that both the spreadsheet and the 2008 Project Status Sheet represent the correct values. If not, provide an updated version with changes identified in response.

Response: The values presented in the spreadsheet are the correct (most current) values. As stated above, the status sheets were prepared based on year-end 2007 data reported in the Company's financial management system, prior to the 2007 rate decision and were submitted to the Commission as part of our annual report in late March. The 2008 budget was revised in April 2008 to conform to the rate decision.

Company Name: Con Edison

Case Description:

Case: 08-E-0539

Response to DPS Interrogatories – Set DPS45

Date of Response: 08/26/2008

Responding Witness: Kressner

Question No. :594

Subject: Research, Development, and Demonstration – follow-up to DPS-208 - Follow-up to DPS-208 1. Provide a list of estimated programs that are planned for production and would result in credits to the R&D budget for the 2012 rate year. 2. For the programs listed below and any additional program provided in part 1 of this IR, provide the amount that would be credited to the R&D budget along with the calculation and description of how it was derived. If the credit amount can not be determined at this time, provide the reason why, also values and calculations that would be used to determine the amount. • Fault current limiter - 2011 at the earliest • New SF6 Leak Camera - 2010 • GIC Monitors - 2009 • Submersible Fast Switch - 2009 or 2010 • Darwin Zero –Crossing Switch - 2010 • Applied Mesh Secondary Monitoring and High Tension Monitoring wireless data gateways - 2009 or 2010 • New Improved Vactor Flush Truck - 2010 • PHEV infrastructure (Metering and Charging) Stations- 2011 at the earliest 3. In the Company's response to DPS-231.1, regarding Grid Optimization, a credit is shown for R&D, which of the programs listed under part 2 of this question includes this credit. If it is not among the possible credit sources listed under part 2, provide an explanation.

Response:

1. Provide a list of estimated programs that are planned for production and would result in credits to the R&D budget for the 2012 rate year.

Response: As we responded to DPS33-517, while only a few successful projects result in hardware or software products that can be capitalized, the following projects might result in products that fit this category. This list is probably not all inclusive or precise, but it is our best guess at this time. The dates indicated are also estimates and probably represent the earliest timeframe for capitalization and in cases like the PHEV Infrastructure Stations the timeframe will be dependent on outside market forces:

- Fault current limiter - 2011 or later
- New SF6 Leak Camera - 2010
- GIC Monitors - 2009
- Submersible Fast Switch - Likely in 2009 or 2010
- Darwin Zero –Crossing Switch - 2010
- Applied Mesh Secondary Monitoring and High Tension Monitoring wireless data gateways - 2009 or 2010
- New Improved Vactor Flush Truck - 2010
- PHEV Infrastructure (Metering and Charging) Stations- 2011 or later

2. For the programs listed below and any additional program provided in part 1 of this IR, provide the amount that would be credited to the R&D budget along with the calculation and description of how it was derived. If the credit amount can not be determined at this time, provide the reason why, also values and calculations that would be used to determine the amount.

Response: As indicated above, only a few successful projects result in hardware or software costs that can be capitalized and when, or if, a project will result costs being capitalized cannot be reasonably predicted. It should be noted that R&D does not independently make the determination of what is capitalized. R&D submits documentation of the associated costs -- along with a written statement from the operating organization that has accepted this hardware or software deeming it to be “used and useful” -- to CECONY Plant Accounting, which makes the decision as to whether or not to capitalize the equipment. Some of the products of R&D projects are just prototypes that do not go into productive use – but rather become the model underlying specifications and purchase orders for new equipment purchased. Even when the R&D products do go into productive use, only the cost associated with the hardware or software that goes into final production mode is considered for capitalization. The costs of development and earlier prototype units remain charged to the R&D account.

3. In the Company’s response to DPS-231.1, regarding Grid Optimization, a credit is shown for R&D, which of the programs listed under part 2 of this question includes this credit.

If it is not among the possible credit sources listed under part 2, provide an explanation.

Response: None of the projects identified in part 2 includes this credit. R&D-funding is mostly for development costs and early prototypes of the software associated with the efforts (DEW circuit builder for Manhattan, DE dynamic model development, DEW circuit builder for Westchester and other visualization applications that we are currently brainstorming with R&D) identified in that response. As stated above, if these efforts do result in products that are put into productive use, only the cost associated with the hardware or software that goes into final production mode is considered for capitalization against Electric Operations accounts. The costs of development and earlier prototype units remain charged to the R&D account. That is why these projects were not included in our list. The response was based upon an assumption that 50% of the R&D funding would be capitalized. The actual amount of the credit will be determined as stated in the answer to part 2 of this question.

Company Name: Con Edison  
Case Description:  
Case: 08-E-0539

Response to DPS Interrogatories – Set DPS45  
Date of Response: 08/26/2008  
Responding Witness: Kressner

Question No. :595

Subject: Research, Development, and Demonstration - Provide any documentation and/or procedures that discusses Con Edison's policy regarding R&D credits, what types of items can result in credit, how credits should be determined, who reviews credit values to ensure it is valid, etc.

Response:

See response to Staff 594.

Company Name: Con Edison

Case Description:

Case: 08-E-0539

Response to DPS Interrogatories – Set DPS49

Date of Response: 09/05/2008

Responding Witness: IIP

Question No. :604

Subject: 3G - Provide the following regarding projects under the 3G program: 1. Name of program. 2. Total funding. 3. Funding source and amount of funding from each source (i.e. R&D, Infrastructure, outside parties, etc.) 4. Where the Company accounts for each funding source in its testimony.

Response:

Attached are the lists of Company projects and the associated sources of funding that address the 3G program objectives. The 3G team also works several on-going projects that address the new concept development and analysis related to future load relief plans, which is sometimes supplemented by work performed by internal support organizations and/or outside consultants. For example, the 3G Team, with support from other internal organizations, develops 3G concepts and plans to implement these concepts in the system as potential solutions for load relief, identifies and initiates new equipment development projects to support the demonstration and implementation of 3G concepts, and performs detailed analysis of 3G concept implementation plans. When needed, this work is often supplemented by reliability and analytical studies performed by outside consulting services, which are listed in the attachment.

In response to question four, all R&D projects shown in the attachment are funded through corporate account 03172. The individual project work order for each project is shown in the attachment. The R&D work orders clear to the corporate account. These projects are referenced on pages 22-23 of Arthur Kressner's testimony. Please note that R&D is now grouping projects more under the term "Smart Grid" instead of 3G to better reflect the common parlance in the industry.

All Central Engineering studies, including those shown in the attachment, are funded under Central Engineering clearing budget.

The co-funding shown in the attachment for the R&D projects identifies other organizations that are providing funding in addition to Con Edison's funding for the two projects shown. The US Department of Homeland Security (DHS) is providing \$25,000,000 for the Superconducting and fault current limiter project (a signed agreement is in place), while NYSERDA is providing an additional \$1,000,000 towards

this project (contract is under negotiations). The Interoperability of Demand Response Resources Demonstration is also receiving co-funding from various organizations. The organizations identified on the spreadsheet (DOE, NYSERDA, Verizon, etc) have all commitment to providing funding for this project totaling approximately \$12,000,000; contract negotiations are underway between all parties.

RESEARCH AND DEVELOPMENT PROGRAM BUDGET  
RATE YEAR ENDING 3/2010  
3G RELATED PROJECTS

		\$X(1000)					
		Rate Year	HISTORICAL				
		Ending	YEAR				
Supporting		3/10	12/07	Variance			
Department	Title				Total Project Co Funding	Organizations	
R&D	SUPERCONDUCTING AND FAULT CURRENT LIMITER PROGRAM	\$ 1,600	\$ -	\$ 1,600	\$26,000,000	DHS, NYSERDA	
R&D	SOLID STATE FAULT CURRENT LIMITERS	\$ 400	\$ 2	\$ 398			
R&D	INDICATION OF FEEDER CONDITION	\$ 150	\$ -	\$ 150			
R&D	SMART GRID	\$ 1,350	\$ -	\$ 1,350			
R&D	INTEROPERABILITY OF DEMAND RESPONSE RESOURCES DEMONSTRATION IN NY	\$ 150	\$ -	\$ 150	\$12,000,000	DOE, NYSERDA, Verizon	
R&D	DISTRIBUTION EQUIPMENT REPLACEMENT RANKING AND VISUALIZATION TOO:	\$ 100	\$ 143	\$ (43)			
R&D	DEMONSTRATION OF DEEP THUNDER WEATHER FORECASTING FOR EMERGENCY MANAGEMENT	\$ 100	\$ 124	\$ (24)			
R&D	ADVANCED SPLICES AND JOINTS	\$ 250	\$ -	\$ 250			
R&D	ADVANCED DISTRIBUTION AUTOMATION TECH	\$ 300	\$ -	\$ 300			
R&D	ADVANCED DISTRIBUTION CABLES	\$ 250	\$ -	\$ 250			
R&D	ADVANCED NETWORK SWITCHES	\$ 300	\$ -	\$ 300			
R&D	ADVANCED OVERHEAD (OH) EQUIPMENT	\$ 100	\$ -	\$ 100			
R&D	ADVANCED OH DISTRIBUTION AUTOMATION TECH	\$ 100	\$ -	\$ 100			
R&D	3G SYSTEM OF THE FUTURE ACTIVITIES	\$ 750	\$ 183	\$ 567			
R&D	SUBMERSIBLE FAST SWITCH FOR LOAD & CAPACITY TRANSFER:	\$ 750	\$ 77	\$ 673			
R&D	DISTRIBUTION FCL DEMO	\$ 750	\$ -	\$ 750			
R&D	SMART FUSES	\$ 100	\$ -	\$ 100			
R&D	INTEGRATION OF DATA FOR OPERATOR DECISION MAKING	\$ 100	\$ -	\$ 100			

**Central Engineering funding - studies**

CE = Central Engineering

Supporting Department	2008 3G Related Projects	2008 BUDGET
CE	Reliability analysis of 3G concept designs	\$110,000.00
CE	Reliability analysis of Mt. Vernon auto-loop sectionalizing, Newtown transferable feeder group, and asset sharing in Eastern Queens	\$50,000.00
CE	Reliability analysis of asset sharing in Midtown East, and transferable load concepts for Gateway / Nevins / Idlewild / Pennsylvania Network	\$50,000.00
CE	EMTP Study - transferable load concepts	\$155,000.00
CE	Conceptual design of substation and feeders - Eastern Queens	\$100,000.00

**Total**    \$465,000.00