1 Q. Please state your name and business address.
2 A. My name is Arthur Kressner and my business address is 4
3 Irving Place, New York, New York 10003.
4 Q. By whom are you employed and in what capacity?
5 A. I am employed by Consolidated Edison Company of New
6 York, Inc. ("Con Edison" or the "Company") as the
7 Director of Electric Power Supply Research and
8 Development ("R&D").
9 Q. Please describe your educational background.
10 A. I graduated in 1969 with a Bachelor of Chemical
11 Engineering from Brooklyn Polytechnic University and
12 have a Master's of Chemical Engineering from New York
13 University in 1972.
14 Q. Please describe your work experience.
15 A. I have been employed by Con Edison for 39 years and
16 have held various engineering and managerial positions
17 in electric production, engineering and research and
18 development.
19 Q. Please generally describe your current
20 responsibilities.
21 A. As the Director of Electric Power Supply Research and
22 Development, I am responsible for developing products
23 to enhance the safety, productivity, and the operations
24 of the Con Edison electric organizations. I oversee

1 seven engineers dedicated to electric project
2 management. I manage the projects associated with
3 electric power supply, guide their development and
4 manage the R&D budget.
5 Q. What is the purpose of your testimony?
6 A. My testimony explains the forecasted level of electric
7 R&D expenditures for the rate year and discusses the
8 programs we plan to undertake in the rate year. The
9 level of funding for R&D expenditures we are seeking
10 for the rate year is the same amount, $19.0 million,
11 that was just approved by the Commission for electric
12 R&D for the rate year that began April 1, 2008. For
13 the purposes of this filing, it is considered a program
14 change because the proposed spending level is an
15 increase of approximately $8.1 million over the
16 historic year in this proceeding. As I will explain,
17 there are no new or changed circumstances that warrant
18 a change in this spending level and the rationale for
19 the proposed program is the same as the rationale
20 accepted by the Commission in adopting this level of
21 spending in the last case.
22 Q. What is the purpose of Con Edison's electric R&D
23 program?

1 A. The purpose of Con Edison's electric R&D program is to
2 develop and demonstrate new processes/methods and
3 technologies that will improve our electric system as
4 well as its operating and business practices through
5 both an internal program and external industry research
6 organizations.
7 Q. Why does the Company need to continue to undertake the
8 development and demonstration of new technologies?
9 A. Our system will require continuing modernization,
10 reinforcement and expansion at the transmission,
11 substation and distribution levels. No one else has a
12 network system as extensive or as highly interconnected
13 as ours. This factor, along with other geographical,
14 population density, congestion and electric usage
15 factors, makes Con Edison's system unique. We are
16 facing issues such as siting and space issues within
17 core parts of the City and severe congestion in the
18 underground that precludes business-as-usual
19 approaches. Because of these issues we need to
20 accelerate the development and demonstration of new
21 technologies in a timeframe that is earlier than that
22 required by others in our industry. In addition, we
23 have found that manufacturers are not willing to
24 unilaterally undertake technology development on these

1 unique problems that, while having specific importance
2 to the Company, do not have immediate broader market
3 potential. In order to stimulate these endeavors, we
4 have found that we need to fund research, often through
5 full-scale demonstrations, to prove feasibility for the
6 concept.
7 Q. Please explain further.
8 A. In the past, prior to industry deregulation, industry
9 consortia with help from manufacturers typically
10 substantially funded many large demonstrations that
11 were too costly for single utilities to entertain.
12 While we continue to seek outside co-funding from these
13 sources, our recent experience indicates that we will
14 be only modestly successful. We have found that many
15 manufacturers now wait for utilities to undertake R&D
16 efforts before they are willing to commit their own
17 resources.
18 Q. How does Con Edison coordinate electric research
19 projects with other outside organizations and electric
20 utilities?
21 A. For those projects where we have a common interest with
22 other industry participants, particularly on large
23 demonstrations, once the basic research and proof of
24 concept have been completed, we work with the Electric

1 Power Research Institute ("EPRI"), New York State
2 Energy Research and Development Authority ("NYSERDA"),
3 Canadian Electric Association ("CEA"), various
4 utilities, and industry, government and private
5 organizations, both national and international.
6 Q. Please describe the Company's internal R&D program.
7 A. The internal electric research program is broken down
8 into six main research areas in general alignment with
9 Company business units: transmission, distribution,
10 system operations, substations, customer operations,
11 and information technology/communications.
12 1. The Transmission R&D program is directed toward
13 improving the reliability, upgrading the capacity,
14 and extending the life of Con Edison's underground
15 and overhead transmission systems. R&D activities
16 in the transmission arena include: development of
17 techniques and equipment to expedite detection and
18 location of dielectric fluid leaks in high-
19 pressure, fluid-filled cables; examination of the
20 present and expected performance of 138-kV and
21 345-kV cable systems; seeking environmentally
22 acceptable substitutes for the dielectric fluids
23 currently used in large power transformer and
24 cable applications; and implementation of state-

of-the-art hardware and software to reduce O&M costs associated with transmission.

2. 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 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 located at the Con Edison Van Nest facility, 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 cables, joints

and transformers; and developing sensors for detecting manhole gasses and other applications.

3. The System Operations R&D program is directed at automating manual processes that provide advanced analytic tools as well as integrating and exchanging data among a variety of different monitoring and control systems. The program focuses on areas that reduce costs as well as improve environmental performance, safety and reliability. R&D projects in the area of system operations include indication of feeder condition, advanced load flow analysis and decision support visualization techniques.

4. The Substation R&D program focuses on reducing the O&M costs of substation equipment and extending the useful life of installed equipment. R&D projects in this area include the demonstration of advanced monitors to assess, both on-line and in real time, the condition (including the operating status) of power transformers, load tap changers and circuit breakers. Our program also seeks to reduce environmental impact by furthering the development of SF6 laser-imaging cameras and leak sealing techniques that can detect and repair

small leaks on substation equipment while the equipment remains in service.

5. 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.

6. The Information Technology and Communications ("IT") R&D program explores technological advances in information and communication technologies that provide efficient data management and allow for the integration of these systems and power delivery systems. The program focuses on developing and providing demonstrations of new and innovative technologies and equipment, including development of visualization techniques for both our existing and Alternate Energy Control Centers.

Q. Please describe research conducted as part of the internal projects in the current program.

A. We have a number of ongoing electric R&D projects that will continue in the rate year and beyond. Some of them are:

1. A real time fault locating methodology that uses Power Quality Nodes that are interfaced with a reactance-to-fault ("RTF") algorithm. This methodology expedites fault locating on our distribution feeders. When this methodology was tested in Manhattan, the time to locate a fault averaged 90 minutes compared to previous year's average of over two hours. This system has been deployed in Manhattan, Brooklyn, Queens and the Bronx. It is scheduled to be installed in substations in Westchester and Staten Island in 2008.

2. Monitoring devices for un-metered services, using wireless technology, are currently under development and demonstration. The Company has approximately 18,000 un-metered service accounts, such as cable TV system power supplies, telephone booths, bus shelters, private streetlights and billboards, where standard metering is very expensive to install and not feasible in some cases. These devices will aid in correctly billing

1 electric consumption. Prototypes of both
2 submersible and overhead devices have been
3 developed and tested in the Meter Shop and field.
4 System-wide deployment of these devices is
5 anticipated during 2008.
6 3. A crab joint with visual indication of a blown
7 limiter is under development. The project calls
8 for the development of a crab joint with a visible
9 fuse so that the employee can determine if the
10 fuse has been damaged without entering the
11 manhole. This will speed up troubleshooting of
12 open mains, leading to reduced risk of outages due
13 to unknown main conditions.
14 4. A 13 kV submersible fast switch for load and
15 capacity transfers is under development that would
16 support make-before-break load transfers. If
17 successful, this design would be deployed as a
18 means to transfer selected loads between stations
19 to reduce load on a network during feeder
20 contingencies.
21 5. A Solid State Breaker with Fault Current Limiting
22 Capability, in conjunction with EPRI, is under
23 development. Con Edison is accelerating this fault
24 current limiting technology for near term use.

1 Some form of this technology is essential to
2 future transmission system fault current
3 mitigation, "open access" for new generation, area
4 substation duty relief, area substation up-rating
5 in existing footprint, and to support distributed
6 generation. Our participation in this program is
7 based on a modular step-by-step development, at
8 increasing voltage levels, that limits the
9 Company's cost exposure for the development
10 because we are not required to commit to the
11 entire program all at once. At this point, EPRI is
12 planning to test this technology during 2008, and
13 the Company is participating in such testing.
14 Q. Is there a "Smart Grid" R&D program or are there R&D
15 projects that support the development of the "Smart
16 Grid"?
17 A. Before I explain the Company's efforts, I would note
18 that the term "Smart Grid" means different things to
19 different people. I have not found any accepted
20 definition of the term. I believe that it's fair to
21 say that any project having a positive impact on making
22 the grid more resilient, both technically and
23 economically, could be viewed as part of the
24 development of a "Smart Grid". That being said, R&D is

1 working closely with Company operating and engineering
2 organizations to develop advanced technologies that
3 will enable "smarter" operations of our transmission
4 and distribution systems. R&D projects focus on smart
5 technologies all the way from the transmission level
6 down to the customer level. These include the
7 development of new and/or improved sensor technologies,
8 new communication options, advanced network system
9 simulation and modeling, machine learning techniques
10 for decision-making and control, and advanced
11 visualization techniques and hardware. These advances
12 will enable faster and more intelligent distribution
13 system reconfiguration and move us towards a system
14 that is easier to repair or alter to redistribute
15 energy from malfunctioning equipment. This work
16 includes many diverse R&D projects that the Company has
17 been pursuing for a number of years, such as:
18 1. Intelligent prediction of weather events and their
19 likely consequences (Deep Thunder). To date, we
20 have spent approximately $170,000 on related
21 projects and have $50,000 budgeted in 2008;
22 2. Developing capability to sense arcing and partial
23 discharge events in real-time as a predictor of
24 incipient failures and/or stray voltage. To date,

1 we have spent $1.9 million on related projects and
2 $600,000 is budgeted in 2008;
3 3. Development of practical Fault-Current limiters
4 and Superconducting cable links. To date, we have
5 funded $2 million in related projects and have
6 $2.3 million budgeted in 2008;
7 4. Development of fast switches to allow network
8 interconnections, load transfers and
9 reconfigurations. To date, we have funded
10 $500,000 on related projects and $1 million
11 budgeted in 2008;
12 5. Development of computer machine learning
13 techniques to anticipate failures before they
14 happen and help direct preventive action and
15 prioritize recovery steps. To date, we have funded
16 $2.4 million on related projects and have $500,000
17 budgeted in 2008; and
18 6. Development of an integrated fast simulation model
19 for the system from transmission through the
20 customer that will provide enhanced outage
21 analysis and facilitate reconfiguration for
22 customer restoration. To date, we have spent
23 $500,000 on related projects and have $850,000
24 budgeted in 2008.

1 It should be noted that the "to date" period includes
2 expenditures for some period of time, which in many
3 cases is longer than the historic year.
4 Q. Are there other projects that can be viewed as part of
5 the development of a "Smart Grid"?
6 A. Yes, projects that seek to enhance the quantity,
7 quality and timeliness of system status information
8 being delivered to operating personnel should be viewed
9 as part of the development of a "smart grid". This
10 includes the AMI pilot programs, which Customer
11 Operations discusses in its testimony. These pilots
12 will contribute to the Company's understanding of the
13 role of enhanced customer meter data in utility
14 operations and demand response initiatives and of the
15 benefits of enhanced communications capabilities
16 between the utility and the customer.
17 Q. Turning to another subject, has R&D developed any
18 successful projects through the years?
19 A. Absolutely. The Company has a long history of
20 successful R&D project completion.
21 Q. Can you describe some recent R&D projects that were
22 considered a success?
23 A. Yes. Examples of some electric R&D projects that were
24 successfully completed include the following:

1. We completed the development and rollout of "clip-on" Target Indicating Sensors ("TIS") and modules using the Hall Effect to remotely obtain relay-target sequence-of-events information from legacy (electro-mechanical relay) substations. These unobtrusive clip-on devices enable improvements in troubleshooting equipment problems; enable relay protection operational diagnosis, and associated feeder restoration times; and avoided failures through condition monitoring and data mining at our older substations that use electro-mechanical analog relays. A total of $150,000 was spent on this project.
2. We developed and demonstrated the application of computer aided lean management ("CALM") methodologies to the Replevin law process. The new system reduces the Replevin cycle time from 120-300 days to approximately 55 days. The Company will print approximately 1.5 million fewer pages annually, resulting in reduced printing costs; reduced costs associated with document handling and retrieval; and provide for an environmentally friendly operation. This system will result in a savings of approximately $2

1 million annually in reduced uncollectible and
2 outstanding receivables. A total of $110,000 was
3 spent on this project.
4 3. We completed the installation of a global
5 positioning system ("GPS") vehicle tracking and
6 dispatching system for the Vactor and Cable trucks
7 in Bronx and Westchester. The new tracking and
8 dispatching system allows supervisors to optimally
9 dispatch vactor/cable trucks with greater
10 productivity realized. During the first four
11 months of operation, an additional 514 structures
12 were cleaned as a result of this initiative. This
13 increased productivity resulted in approximately
14 $700,000 in savings for just the application in
15 the Bronx and Westchester. A total of $150,000 was
16 spent on this project. This project has lead to a
17 Company wide roll out of this system by IR and
18 Transportation.
19 4. We developed a secondary monitoring device that is
20 capable of measuring and transmitting vital
21 information, such as current, voltage, and power
22 quality, in order to assess the condition and
23 operation of the secondary grid. The Micro Remote
24 Terminal Unit (μRTU) is a new device invented for

our application to interface with secondary distribution feeders, take measurements, and transmit that data wirelessly back to a server. The unit is based on advanced metering technologies so that it can be incorporated and take advantage of other advanced technologies as they evolve. A total of $138,000 has been spent on the development of this device. The initial trial of these devices is starting in 2008.

5. We successfully tested a new 27kV underground fast network feeder switch. This new switch, which operates in less than three cycles, allows the system operator to transfer network load between Area Substations during contingencies via a group of isolated network customers (265/460V installations and multi-bank customers) connected between two area substations using distribution feeders; one substation is the normal supply and the other is an alternate supply. This new switch also improves upon the underground switches we presently use. It is significantly smaller and lighter and SF-6 free, and, therefore, gains the associated environmental and operational benefits of these features. The Company is starting to

1 deploy these switches in the field. We spent
2 $180,000 on the development of this switch.
3 6. We developed and demonstrated an integrated system
4 model ("ISM") from the transmission, substation
5 and distribution systems down to individual
6 secondary customers for the Sutton network. The
7 ISM has the capability to compare the power flow
8 and reliability of the existing system to any new
9 system design scenarios. This model provides the
10 3G System of the Future team with the tools needed
11 to evaluate various designs with fewer secondary
12 distributed network customers. We have spent
13 $425,000 on the development of this model.
14 7. We completed development, fabrication and
15 construction of house shunt transformers(a.k.a.
16 PhazeSaver®), which provide the capability to
17 provide 240 volt power from a single 120 volt
18 phase or from a service with an open neutral (and
19 two good phases). Using a single 120/240 volt
20 step-up auto transformer, 240 volt service can be
21 immediately restored to customers having phase or
22 ground problems until permanent repairs can be
23 scheduled. This device represents a significant
24 cost and size advantage over commercially

1 available units. 30 such units have been
2 constructed and deployed in the field. An
3 additional 100 units have been ordered to be
4 placed in the Company warehouse system.
5 Presently, the Company has 824 shunts and bridges
6 installed at locations with problems that this
7 device could potentially address. The
8 installation of PhazeSaver® costs approximately
9 one-half the cost of a shunt, as it avoids the
10 deployment of about 100 feet of temporary cable,
11 use of a bucket truck, and the need use more
12 expensive labor (the PhazeSaver® can be installed
13 by Meter Tester A or B personnel vs. Overhead
14 Troubleshooters). The Company uses the device for
15 powering electric stoves and for air conditioning
16 installations where elderly people are involved.
17 On occasion, we expect to install the device for
18 customers with out-of-service electric clothes
19 dryers. We have spent $20,000 on the development
20 of this device and have filed a patent application
21 to protect the intellectual property. If a patent
22 is issued, we contemplate licensing one or more
23 vendors to produce the product and pay us
24 royalties on its sale.

1 Q. Are there any Company productivity savings resulting
2 from the R&D projects?
3 A. Yes, several R&D projects do result in productivity
4 savings for company operations. As the products of
5 these R&D projects are adopted and implemented their
6 impact helps the Company meet its goals and their
7 contribution is reflected in the cost of the project.
8 In fact, as a result of these projects, the rate
9 increase is lower than it otherwise would have been.
10 Q. How much did the Company spend in R&D in the historic
11 year?
12 A. In 2007, R&D expenditures were $10.8 million. Details
13 of our on-going internal projects are provided in
14 Exhibit __ (AK-1) entitled "RESEARCH AND DEVELOPMENT
15 PROGRAM BUDGET - 4/2009 THRU 3/2012."
16 Q. Was this document prepared under your direction and
17 supervision?
18 A. Yes, it was.
19 MARK FOR IDENTIFICATION AS EXHIBIT __ (AK-1)
20 Q. What are the changes to the base program going forward
21 from the historical year?
22 A. I would first mention, as discussed earlier in my
23 testimony, that the Commission's recent rate order
24 adopts R&D funding at a $19 million annual level.

1 Changes from the historic year therefore reflect the
2 recently-approved expanded effort, including program
3 initiatives approved in the prior rate case, which are
4 continuing, and an interoperability research and
5 development project recently selected by the United
6 States Department of Energy ("USDOE") and NYSERDA.
7 Q. Are there any credits in the historic year, similar to
8 ones that you had identified in the prior rate case,
9 which have lowered your actual spending?
10 A. No, we didn't have any credits for capitalization
11 during the historic year. We do, however, anticipate
12 there will be more in the future as products of R&D are
13 used in the field. Any such credits will be applied
14 against our budget and may result in additional
15 spending for other projects.
16 Q. Can you describe the program initiatives that were
17 approved in the prior rate case, that are starting (or
18 have been started) in 2008 and will continue in the
19 rate year?
20 A. The initiatives are:
21 • "Smart Grid" (called system design in the prior
22 rate case);
23 • Superconducting and Fault Current Limiters;

- Network Reliability and Monitoring;
- Energy Efficiency and Demand Response; and
- Environmental Sustainability.

Q. Please explain the "Smart Grid" program.

A. As I noted before, while many of our ongoing projects can be considered "Smart Grid" related, this program will demonstrate several "Smart Grid" concepts in the overhead system and underground network system, including innovatively integrating state-of-the-art equipment and technology with advances in computer analysis, monitoring and control, coupled with an advanced metering initiative ("AMI") and communications infrastructure, to significantly enhance system reliability and quality of service. The selected areas for implementation will be upgraded to perform as an "intelligent" electric distribution system through the development and use of advanced sensors, field devices and customer communications channels. Advanced analytical real-time decision-making software and sophisticated equipment and controls would be integrated into Control Center Operations. Various approaches or technologies, such as optimal conductor sizing, reducing phase imbalance, VAR control,

1 improving transformer efficiencies, and voltage control
2 will be tested and evaluated. Our efforts on the
3 project, called the "Smart Grid" initiative, began in
4 April 2008 (although as I have noted other projects
5 have been underway for some time). Our estimated
6 spending on these efforts is $1.2 million in 2008, $1.2
7 million in 2009; $1.5 million in 2010 and $2.0 million
8 in 2011, as shown in Exhibit __ (AK-1).
9 Q. Please describe your Superconducting and Fault Current
10 Limiter program.
11 A. It involves the development, testing, demonstration and
12 deployment of fast acting, robust, rugged fault current
13 limiters with quick recovery times at various
14 transmission voltage levels to mitigate fault currents,
15 enable interconnection of additional capacity
16 (including independent power producers and co-
17 generation) to our system and increase the ability to
18 effectively share existing assets. Fault current
19 limiters will reduce or eliminate the continuing need
20 for breaker replacement and up-rate programs. Project
21 Hydra, which is supported and funded by the United
22 States Department of Homeland Security, is a combined
23 demonstration of a superconducting cable and a stand-
24 alone fault current limiter in a 13kV 4,000 amp

1 application that would enable network to network
2 interconnections and more effective sharing of assets
3 between substations to improve the resiliency and
4 reliability of the grid. The program also includes
5 parallel development efforts on a new type of self
6 limiting superconducting cable and efforts to determine
7 feasibility of reducing future superconducting cable
8 sizes to support retro-fit into existing ducts. The
9 R&D funding for fault current limiters and Project
10 Hydra is estimated at be $1.8 million in 2008, $2.6
11 million in 2009, $2.0 million in 2010 and $3.1 million
12 in 2011.
13 Q. Please explain the Network Reliability and Monitoring
14 program.
15 A. This R&D initiative will develop and demonstrate an
16 advanced primary and secondary supervisory control and
17 data acquisition ("SCADA") whereby a new two-way
18 network remote monitoring system - RMSx (Remote
19 Monitoring System Expansion) will be developed and
20 demonstrated. The new two-way network remote
21 monitoring system will have the capability to monitor
22 (open/close position) and control (open/make automatic)
23 the existing network protector located at the sub-
24 surface network transformer vault. The system will

allow control center personnel to identify sources of alive-on-backfeed ("ABFs"). The use of an RMSx system will substantially reduce the time to clear the ABFs, since determining the status of the protector and blocking open the protector, if necessary, can all be done without vault entry. RMSx will provide for additional monitoring inputs to allow improved sensing of the conditions of the subsurface network transformer vaults.

Another proposed project in this category addresses the need for developing an analytical tool for better operator decision making by integrating information from currently disparate data sources into an integrated system model. In this project, a model consisting of the entire electrical infrastructure will be built from transmission to secondary distribution network. The R&D effort will demonstrate the integration of machine learning to evaluate and predict the performance of the electrical infrastructure based on real-time information run against the model.

Adequate assessment of the electric distribution system and how it impacts customers requires modeling of the area substation, primary feeders, network secondary and services supplying the customers. A real-time stable

and reliable integrated load flow and reliability model is envisioned that will assess the state of the system and loads on components for all levels of contingency, highlighting potential problems that may affect other facilities and/or customers' services. Work on this initiative has just begun. The forecasted spending levels are: in 2008, $1.0 million; in 2009, $1.7 million; in 2010, $1.2 million; and in 2011, $1.1 million.

Q. What about the Company's Energy Efficiency and Demand Response R&D program?

A. The program involves research on energy efficiency and demand response, as well as greenhouse gas reduction-from dynamic, integrated systems or networked perspective that simultaneously addresses electric energy savings, demand reductions, and peak load management. This encompasses numerous system components that operate together, including:

- High efficiency energy end use devices;
- Internet protocol ("IP") addressable electrical devices;

- Control systems to optimize device performance while in use and guarantee devices are turned off when they are not needed;
- Two-way communications to allow automated control of devices in response to pricing or emergency demand reduction signals; and
- Dynamic systems that allow real-time integration of consumers and their building energy systems into system and market operations.

Electric energy efficiency and demand response are an important focus of the R&D program. Program projects address the residential, commercial, and industrial sectors. Greater emphasis will be placed on the commercial and industrial segments, where many of the energy management infrastructures are already in place to enable additional levels of integration and automation. Although the mass (residential and small commercial) market currently lacks the required infrastructure, this is also an important target market for energy efficiency and demand response. We forecast spending $200,000 in 2008, $300,000 in 2009, $500,000 in 2010 and $600,000 in 2011.

1 Q. Please explain the Company's Environmental
2 Sustainability R&D program.
3 A. The focus of this program is to identify the Company's
4 operational impact on greenhouse gas emissions and
5 investigate various new technologies to achieve
6 reductions in CO_2 and other greenhouse gas emissions.
7 The benefits to be derived can not be quantified at
8 this time; however, they will include reducing our
9 impact on global warming, promoting cleaner air, and
10 lowering energy consumption costs. One such project is
11 to deploy up to 100 plug-in hybrid electric vehicles
12 ("PHEVs") as part of our fleet both to gain first-hand
13 experience with the operation of these vehicles as well
14 as to understand the impact on our system. While we
15 have just begun supporting activities associated with
16 this initiative, in 2008, we expect spending to be
17 $150,000, $300,000 in 2009, $400,000 in 2010 and
18 $500,000 in 2011.
19 Q. Please describe the interoperability project which was
20 recently selected by USDOE and NYSERDA for funding.
21 A. The project, in which the Company has partnered with
22 Verizon, Innoventive Power, and Infotility, is entitled
23 "Interoperability of Demand Response Resources
24 Demonstration in New York." This project is intended

1 to develop and demonstrate methodologies to achieve
2 true interoperability between an electric delivery
3 company and end-use retail electric customers,
4 enhancing the reliability of the distribution grid and
5 the efficiency of its operations. Details of the work
6 are under negotiations, but we envision this includes
7 developing advanced sensors, communications and control
8 technologies; monitoring, diagnostic, and automation
9 capabilities, and two-way communication between demand
10 response service providers and electric generation and
11 loads within consumer premises to demonstrate the
12 ability to greatly enhance the control of customer
13 load. As part of this project, we expect to explore
14 new distribution system configurations, improve
15 understanding of steady-state and dynamic performance
16 of complex grid configurations with multiple types of
17 distributed generation, develop improved monitoring,
18 control, and protection capabilities, and develop clear
19 coordination protocols.
20 Q. What is the project schedule and funding requirements?
21 A. The project is scheduled to be completed in 3 years
22 with $6.8 million of federal funding, $1.0 million of
23 NYSERDA funding and $5.2 million of private funding
24 totaling $13.0 million. Con Edison's funding is

1 approximately $600,000 in total over the three years
2 with $150,000 in 2009, $250,000 in 2010 and $200,000 in
3 2011.
4 Q. Does the funding associated with these initiatives
5 require additional R&D staffing?
6 A. In Case 07-E-0523, I indicated that we planned to seek
7 out and utilize human resources outside of R&D (both
8 company personnel and contractors) to complete the new
9 initiatives and demonstrations. The cost of this
10 additional personnel support was included in the
11 estimated project costs for the new initiatives. In
12 the intervening time since the last filing, we
13 concluded that this approach is unworkable. While
14 internal company resources, outside of R&D, continue to
15 support ongoing R&D projects, their commitments to
16 other O&M and capital work have limited their ability
17 to increase their contributions to an expanded R&D
18 program. While additional contract labor is an integral
19 part of accomplishing the new initiatives, we do not
20 think that having contractors manage their own work or
21 that of others is a practical approach. Therefore, to
22 accomplish the work we have set out, we are planning to
23 hire two full-time employees dedicated to R&D to
24 support the technology initiatives and demonstration

1 efforts that I have just described. The cost for each
2 position is estimated to be $100,000 annually, or
3 $200,000 in total. This project management cost does
4 not result in an increase in overall R&D funding. These
5 positions will be funded through an aggregate reduction
6 of $200,000 in various program budgets.
7 Q. Does this conclude your testimony?
8 A. Yes, it does.

RESEARCH AND DEVELOPMENT PROGRAM BUDGET
RATE YEAR ENDING 3/2010

Title	Rate Year Ending 3/10 ($X(1000))	HISTORICAL YEAR 12/07 ($X(1000))	Variance
ADMINISTRATION			
SALARIES AND WAGES	$ 1,800	$ 1,610	$ 190
OTHER EXPENSES	$ 205	$ 182	$ 23
PATENT SEARCHES IN CONNECTION WITH COMPANY R&D TECHNOLOGY APPLICATION	$ 100	$ 49	$ 51
DEVELOPMENT OF R&D DEPARTMENT WEBSITE	$ -	$ 4	$ (4)
TOTAL ADMINSTRATION	**$ 2,105**	**$ 1,846**	**$ 259**
INSTITUTIONAL			
EPRI BASE PROGRAM	$ 3,500	$ 2,161	$ 1,339
EPRI'S DYNAMIC ENERGY MANAGEMENT (ENERGY EFFICIENCY) INITIATIVE	$ -	$ 133	$ (133)
CEA POWER DELIVERY PROJECTS	$ 90	$ 66	$ 24
TOTAL INSTITUTIONAL	**$ 3,590**	**$ 2,360**	**$ 1,230**
INTERNAL PROGRAM			
TRANSMISSION PROGRAM			
SYSTEM RELIABILITY PROJECTS			
REAL-TIME RELAY PROTECTION AUTOMATED FAULT ANALYSIS SYSTEM	$ -	$ 270	$ (270)
DEMONSTRATION OF GROUND PENETRATING IMAGING RADAR FOR FEEDER PLACEMENT	$ -	$ 185	$ (185)
DEVELOPMENT OF NEW TECHNIQUE FOR COMMISSIONING TEST OF TRANSMIS	$ -	$ 180	$ (180)
SUPERCONDUCTING AND FAULT CURRENT LIMITER PROGRAM	$ 1,600	$ -	$ 1,600
SOLID STATE FAULT CURRENT LIMITERS	$ 400	$ 2	$ 398
PHASORS PROJECTS	$ 200	$ -	$ 200
WIDE AREA MONITORING SYSTEMS	$ 100	$ -	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 182	$ (132)
SUBTOTAL SYSTEM RELIABILITY PROJECTS	*$ 2,350*	*$ 819*	*$ 1,531*
SYSTEM OPERATIONS PROJECTS			
INDICATION OF FEEDER CONDITION	$ 150	$ -	$ 150
REAL-TIME BATTLEFIELD VISIBILITY COCKPIT CONTROL CENTER DECISION SUPPORT -		$ 42	$ (42)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 230	$ (130)
SUBTOTAL SYSTEM OPERATIONS PROJECTS	*$ 250*	*$ 272*	*$ (22)*
SUBSTATION PROJECTS			
INTEGRATED LIFE EXTENSION, ASSETS MANAGEMENT AND SHARING INFRASTRUCTURE STRATEGIES	$ 150	$ -	$ 150
CONDITION BASED MONITORING FOR CKT BKRS, XFMRS & OTHER SUBSTATION EQUIPMENT	$ -	$ 80	$ (80)
ADVANCED SUBSTATION AUTOMATION TECH	$ 150	$ -	$ 150
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 109	$ (9)
SUBTOTAL SUBSTATION PROJECTS	*$ 400*	*$ 189*	*$ 211*
TOTAL TRANSMISSION PROGRAM	**$ 3,000**	**$ 1,280**	**$ 1,720**
DISTRIBUTION PROGRAM			
NETWORK EQUIPMENT RELIABILITY PROJECTS			
SMART GRID	$ 1,350	$ -	$ 1,350
NETWORK RELIABILITY AND MONITORING	$ 1,500	$ -	$ 1,500
INTEROPERABILITY OF DEMAND RESPONSE RESOURCES DEMONSTRATION IN NY	$ 150	$ -	$ 150
SECONDARY MONITORING SUTTON NETWORK PILOT	$ -	$ 378	$ (378)
CUSTOMER LOAD DEMAND MODELS DEVELOPMENT	$ -	$ 349	$ (349)
ELECTRIC SYSTEM MODEL BUILDING & MAINTENANCE TOOL DEVELOPMENT AND DEMONSTRATI(	$ -	$ 188	$ (188)
SCADA IMPLEMENTATION ON NETWORK SUBMERSIBLE SWITCHES	$ -	$ 177	$ (177)
DISTRIBUTION EQUIPMENT REPLACEMENT RANKING AND VISUALIZATION TOOL	$ 100	$ 143	$ (43)
STATEN ISLAND PRIMARY NETWORK VISUALIZATION SYSTEM (SIPS)	$ -	$ 136	$ (136)
DEMONSTRATION OF DEEP THUNDER WEATHER FORECASTING FOR EMERGENCY MANAGEMENT	$ 100	$ 124	$ (24)
NETRACC APPLICATIONS RESEARCH FOR DISTRIBUTION	$ 105	$ 105	$ -
CURRENT TRANSFORMER DISCONNECT DEVICE	$ -	$ 252	$ (252)
DISTRIBUTION CABLE AND SPLICE CENTER FOR EXCELLENCE AT VAN NEST	$ 250	$ -	$ 250
ADVANCED SPLICES AND JOINTS	$ 250	$ -	$ 250
ADVANCED DISTRIBUTION AUTOMATION TECH	$ 300	$ -	$ 300
ADVANCED DISTRIBUTION CABLES	$ 250	$ -	$ 250
ADVANCED NETWORK SWITCHES	$ 300	$ -	$ 300
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 503	$ (453)
SUBTOTAL NETWORK EQUIPMENT RELIABILITY PROJECTS	*$ 4,705*	*$ 2,355*	*$ 2,350*

RESEARCH AND DEVELOPMENT PROGRAM BUDGET
RATE YEAR ENDING 3/2010

Title	Rate Year Ending 3/10	HISTORICAL YEAR 12/07	Variance
		$X(1000)	
FAULT LOCATING PROJECTS			
REAL TIME FAULT LOCATION SYSTEM	$ 100	$ 33	$ 67
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 163	$ (63)
SUBTOTAL FAULT LOCATING PROJECTS	*$ 200*	*$ 196*	*$ 4*
STRAY VOLTAGE / MANHOLE EVENTS PROJECTS			
DECISION SUPPORT SYSTEM (DSS) FOR STRAY VOLTAGE AND MANHOLE EVENTS ANALYSIS	$ -	$ 830	$ (830)
DESIGN AND DEVELOPMENT OF A HYBRID MANHOLE COVER	$ -	$ 106	$ (106)
IMPROVED EARLY DETECTION OF URBAN STRAY VOLTAGE CONDITIONS	$ 100	$ 106	$ (6)
PHASE III COMPOSITE COVER LOADING	$ -	$ 110	$ (110)
ADVANCED STRAY VOLTAGE PROGRAM	$ 250	$ -	$ 250
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 227	$ (127)
SUBTOTAL STRAY VOLTAGE / MANHOLE EVENTS PROJECTS	*$ 450*	*$ 1,379*	*$ (929)*
OVERHEAD PROJECTS			
ADVANCED OVERHEAD (OH) EQUIPMENT	$ 100	$ -	$ 100
ADVANCED OH DISTRIBUTION AUTOMATION TECH	$ 100	$ -	$ 100
ADVANCED RIGHT-OF-WAY (R-O-W) MAINTENANCE TECHNIQUES	$ 100	$ -	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ -	$ 50
SUBTOTAL OVERHEAD PROJECTS	*$ 350*	*$ -*	*$ 350*
SYSTEM OF THE FUTURE PROJECTS			
3G SYSTEM OF THE FUTURE ACTIVITIES	$ 750	$ 183	$ 567
SUBMERSIBLE FAST SWITCH FOR LOAD & CAPACITY TRANSFERS	$ 750	$ 77	$ 673
DISTRIBUTION FCL DEMO	$ 750	$ -	$ 750
SMART FUSES	$ 100	$ -	$ 100
INTEGRATION OF DATA FOR OPERATOR DECISION MAKING	$ 100	$ -	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 107	$ (7)
SUBTOTAL SYSTEM OF THE FUTURE PROJECTS	*$ 2,550*	*$ 367*	*$ 2,183*
TOTAL DISTRIBUTION PROGRAM	***$ 8,255***	***$ 4,297***	***$ 3,958***
ENVIRONMENTAL, HEALTH AND SAFETY PROGRAM			
DEVELOPMENT OF A "CONSEQUENTIAL" LEARNING SIMULATOR FOR SAFETY IMPROVEMENT	$ -	$ 146	$ (146)
ENVIRONMENTAL SUSTAINABILITY	$ 300	$ -	$ 300
PLUG-IN HYBRID ELECTRIC VEHICLE PROJECTS	$ 200	$ 15	$ 185
ADVANCED LEAK DETECTION SYSTEM	$ 100	$ -	$ 100
CORPORATE SAFETY IMPROVEMENT PROGRAM	$ 100	$ -	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 79	$ (29)
TOTAL ENVIRONMENTAL, HEALTH AND SAFETY PROGRAM	**$ 750**	**$ 240**	**$ 510**
CUSTOMER OPERATIONS PROGRAM			
AMR/AMI AND METERING PROJECTS			
AMR/AMI BUSINESS CASE-CONSULTANT	$ 50	$ 116	$ (66)
AMI - SPECIFICATION DEVELOPMENT	$ -	$ 119	$ (119)
UNMETERED SERVICES METER DEMONSTRATION	$ 300	$ -	$ 300
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 6	$ 44
SUBTOTAL AMR/AMI AND METERING PROJECTS	*$ 400*	*$ 241*	*$ 159*
ENERGY EFFICIENCY PROJECTS			
EPRI ASSESSMENT OF ENERGY EFFICIENT POWER SUPPLIES	$ -	$ 175	$ (175)
ENERGY EFFICIENCY AND DEMAND RESPONSE	$ 300	$ -	$ 300
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ -	$ 100
SUBTOTAL ENERGY EFFICIENCY PROJECTS	*$ 400*	*$ 175*	*$ 225*
CUSTOMER SERVICE PROJECTS			
CALM ANALYSIS DEMONSTRATION FOR IMPROVED REPLEVIN PROCESS	$ -	$ 110	$ (110)
IMPROVED LBMP MARKET SIMULATION MODEL	$ -	$ 113	$ (113)
CALL CENTER OPERATIONS SYSTEMS	$ 250	$ -	$ 250
ADVANCED CUSTOMER SERVICE TECHNOLOGIES	$ 100	$ -	$ 100
THEFT OF SERVICES / COLLECTIONS SYSTEMS	$ 100	$ -	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 142	$ (92)
SUBTOTAL CUSTOMER SERVICE PROJECTS	*$ 500*	*$ 365*	*$ 135*
TOTAL CUSTOMER OPERATIONS PROGRAM	**$ 1,300**	**$ 781**	**$ 519**
TOTAL BASE PROGRAM	**$ 19,000**	**$ 10,804**	**$ 8,196**

RESEARCH AND DEVELOPMENT PROGRAM BUDGET
RATE YEAR ENDING 3/2011

Title	Rate Year Ending 3/11	$X(1000) Rate Year Ending 3/10	Varianc
BASE PROGRAM			
ADMINISTRATION			
SALARIES AND WAGES	$ 1,800	$ 1,800	$ -
OTHER EXPENSES	$ 205	$ 205	$ -
PATENT SEARCHES IN CONNECTION WITH COMPANY R&D TECHNOLOGY APPLICATION	$ 100	$ 100	$ -
TOTAL ADMINSTRATION	**$ 2,105**	**$ 2,105**	$ -
INSTITUTIONAL			
EPRI BASE PROGRAM	$ 3,500	$ 3,500	$ -
CEA POWER DELIVERY PROJECTS	$ 90	$ 90	$ -
TOTAL INSTITUTIONAL	**$ 3,590**	**$ 3,590**	$ -
INTERNAL PROGRAM			
TRANSMISSION PROGRAM			
SYSTEM RELIABILITY PROJECTS			
SUPERCONDUCTING AND FAULT CURRENT LIMITER PROGRAM	$ 1,700	$ 1,600	$ 100
SOLID STATE FAULT CURRENT LIMITERS	$ 400	$ 400	$ -
PHASORS PROJECTS	$ 150	$ 200	$ (50)
WIDE AREA MONITORING SYSTEMS	$ 50	$ 100	$ (50)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL SYSTEM RELIABILITY PROJECTS	*$ 2,350*	*$ 2,350*	$ -
SYSTEM OPERATIONS PROJECTS			
INDICATION OF FEEDER CONDITION	$ 50	$ 150	$ (100)
REAL-TIME BATTLEFIELD VISIBILITY COCKPIT CONTROL CENTER DECISION SUPPORT -			$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 200	$ 100	$ 100
SUBTOTAL SYSTEM OPERATIONS PROJECTS	*$ 250*	*$ 250*	$ -
SUBSTATION PROJECTS			
INTEGRATED LIFE EXTENSION, ASSETS MANAGEMENT AND SHARING INFRASTRUCTURE STRATEGIES	$ 100	$ 150	$ (50)
ADVANCED SUBSTATION AUTOMATION TECH	$ 200	$ 150	$ 50
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL SUBSTATION PROJECTS	*$ 400*	*$ 400*	$ -
TOTAL TRANSMISSION PROGRAM	**$ 3,000**	**$ 3,000**	$ -
DISTRIBUTION PROGRAM			
NETWORK EQUIPMENT RELIABILITY PROJECTS			
SMART GRID	$ 1,500	$ 1,350	$ 150
NETWORK RELIABILITY AND MONITORING	$ 1,250	$ 1,500	$(250)
INTEROPERABILITY OF DEMAND RESPONSE RESOURCES DEMONSTRATION IN NY	$ 250	$ 150	$ 100
DISTRIBUTION EQUIPMENT REPLACEMENT RANKING AND VISUALIZATION TOOL	$ 100	$ 100	$ -
DEMONSTRATION OF DEEP THUNDER WEATHER FORECASTING FOR EMERGENCY MANAGEMENT	$ 100	$ 100	$ -
NETRACC APPLICATIONS RESEARCH FOR DISTRIBUTION	$ 105	$ 105	$ -
DISTRIBUTION CABLE AND SPLICE CENTER FOR EXCELLENCE AT VAN NEST	$ 250	$ 250	$ -
ADVANCED SPLICES AND JOINTS	$ 250	$ 250	$ -
ADVANCED DISTRIBUTION AUTOMATION TECH	$ 300	$ 300	$ -
ADVANCED DISTRIBUTION CABLES	$ 250	$ 250	$ -
ADVANCED NETWORK SWITCHES	$ 300	$ 300	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL NETWORK EQUIPMENT RELIABILITY PROJECTS	*$ 4,705*	*$ 4,705*	$ -
FAULT LOCATING PROJECTS			
REAL TIME FAULT LOCATION SYSTEM	$ 200	$ 100	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL FAULT LOCATING PROJECTS	*$ 300*	*$ 200*	$ 100

RESEARCH AND DEVELOPMENT PROGRAM BUDGET
RATE YEAR ENDING 3/2011

Title	Rate Year Ending 3/11	$X(1000) Rate Year Ending 3/10	Varianc
STRAY VOLTAGE / MANHOLE EVENTS PROJECTS			
IMPROVED EARLY DETECTION OF URBAN STRAY VOLTAGE CONDITIONS	$ 100	$ 100	$ -
ADVANCED STRAY VOLTAGE PROGRAM	$ 150	$ 250	$ (100)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL STRAY VOLTAGE / MANHOLE EVENTS PROJECTS	*$ 350*	*$ 450*	$ (100)
OVERHEAD PROJECTS			
ADVANCED OVERHEAD (OH) EQUIPMENT	$ 100	$ 100	$ -
ADVANCED OH DISTRIBUTION AUTOMATION TECH	$ 150	$ 100	$ 50
ADVANCED RIGHT-OF-WAY (R-O-W) MAINTENANCE TECHNIQUES	$ 50	$ 100	$ (50)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL OVERHEAD PROJECTS	*$ 350*	*$ 350*	$ -
SYSTEM OF THE FUTURE PROJECTS			
3G SYSTEM OF THE FUTURE ACTIVITIES	$ 850	$ 750	$ 100
SUBMERSIBLE FAST SWITCH FOR LOAD & CAPACITY TRANSFERS	$ 750	$ 750	$ -
DISTRIBUTION FCL DEMO	$ 750	$ 750	$ -
SMART FUSES	$ -	$ 100	$ (100)
INTEGRATION OF DATA FOR OPERATOR DECISION MAKING	$ 100	$ 100	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL SYSTEM OF THE FUTURE PROJECTS	*$ 2,550*	*$ 2,550*	$ -
TOTAL DISTRIBUTION PROGRAM	***$ 8,255***	***$ 8,255***	$ -
ENVIRONMENTAL, HEALTH AND SAFETY PROGRAM			
ENVIRONMENTAL SUSTAINABILITY	$ 400	$ 300	$ 100
PLUG-IN HYBRID ELECTRIC VEHICLE PROJECTS	$ 200	$ 200	$ -
ADVANCED LEAK DETECTION SYSTEM	$ 50	$ 100	$ (50)
CORPORATE SAFETY IMPROVEMENT PROGRAM	$ 50	$ 100	$ (50)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
TOTAL ENVIRONMENTAL, HEALTH AND SAFETY PROGRAM	**$ 750**	**$ 750**	$ -
CUSTOMER OPERATIONS PROGRAM			
AMR/AMI AND METERING PROJECTS			
AMR/AMI BUSINESS CASE-CONSULTANT	$ -	$ 50	$ (50)
UNMETERED SERVICES METER DEMONSTRATION	$ 100	$ 300	$ (200)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL AMR/AMI AND METERING PROJECTS	*$ 150*	*$ 400*	$ (250)
ENERGY EFFICIENCY PROJECTS			
ENERGY EFFICIENCY AND DEMAND RESPONSE	$ 500	$ 300	$ 200
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL ENERGY EFFICIENCY PROJECTS	*$ 600*	*$ 400*	$ 200
CUSTOMER SERVICE PROJECTS			
CALL CENTER OPERATIONS SYSTEMS	$ 200	$ 250	$ (50)
ADVANCED CUSTOMER SERVICE TECHNOLOGIES	$ 200	$ 100	$ 100
THEFT OF SERVICES / COLLECTIONS SYSTEMS	$ 100	$ 100	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL CUSTOMER SERVICE PROJECTS	*$ 550*	*$ 500*	$ 50
TOTAL CUSTOMER OPERATIONS PROGRAM	**$ 1,300**	**$ 1,300**	$ 100
TOTAL BASE PROGRAM	**$ 19,000**	**$ 19,000**	$ -

RESEARCH AND DEVELOPMENT PROGRAM BUDGET
RATE YEAR ENDING 3/2012

Title	Rate Year Ending 3/12	$X(1000) Rate Year Ending 3/10	Varianc
BASE PROGRAM			
ADMINISTRATION			
SALARIES AND WAGES	$ 1,800	$ 1,800	$ -
OTHER EXPENSES	$ 205	$ 205	$ -
PATENT SEARCHES IN CONNECTION WITH COMPANY R&D TECHNOLOGY APPLICATION	$ 100	$ 100	$ -
TOTAL ADMINSTRATION	**$ 2,105**	**$ 2,105**	$ -
INSTITUTIONAL			
EPRI BASE PROGRAM	$ 3,500	$ 3,500	$ -
CEA POWER DELIVERY PROJECTS	$ 90	$ 90	$ -
TOTAL INSTITUTIONAL	**$ 3,590**	**$ 3,590**	$ -
INTERNAL PROGRAM			
TRANSMISSION PROGRAM			
SYSTEM RELIABILITY PROJECTS			
SUPERCONDUCTING AND FAULT CURRENT LIMITER PROGRAM	$ 1,800	$ 1,700	$ 100
SOLID STATE FAULT CURRENT LIMITERS	$ 500	$ 400	$ 100
PHASORS PROJECTS	$ 50	$ 150	$ (100)
WIDE AREA MONITORING SYSTEMS	$ -	$ 50	$ (50)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL SYSTEM RELIABILITY PROJECTS	*$ 2,400*	*$ 2,350*	$ 50
SYSTEM OPERATIONS PROJECTS			
INDICATION OF FEEDER CONDITION	$ -	$ 50	$ (50)
REAL-TIME BATTLEFIELD VISIBILITY COCKPIT CONTROL CENTER DECISION SUPPORT -			$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 150	$ 200	$ (50)
SUBTOTAL SYSTEM OPERATIONS PROJECTS	*$ 150*	*$ 250*	$ (100)
SUBSTATION PROJECTS			
INTEGRATED LIFE EXTENSION, ASSETS MANAGEMENT AND SHARING INFRASTRUCTURE STRATEGIES	$ 150	$ 100	$ 50
ADVANCED SUBSTATION AUTOMATION TECH	$ 200	$ 200	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL SUBSTATION PROJECTS	*$ 450*	*$ 400*	$ 50
TOTAL TRANSMISSION PROGRAM	**$ 3,000**	**$ 3,000**	$ -
DISTRIBUTION PROGRAM			
NETWORK EQUIPMENT RELIABILITY PROJECTS			
SMART GRID	$ 2,050	$ 1,500	$ 550
NETWORK RELIABILITY AND MONITORING	$ 1,200	$ 1,250	$ (50)
INTEROPERABILITY OF DEMAND RESPONSE RESOURCES DEMONSTRATION IN NY	$ 200	$ 250	$ (50)
DISTRIBUTION EQUIPMENT REPLACEMENT RANKING AND VISUALIZATION TOOL	$ -	$ 100	$ (100)
DEMONSTRATION OF DEEP THUNDER WEATHER FORECASTING FOR EMERGENCY MANAGEMENT	$ -	$ 100	$ (100)
NETRACC APPLICATIONS RESEARCH FOR DISTRIBUTION	$ 105	$ 105	$ -
DISTRIBUTION CABLE AND SPLICE CENTER FOR EXCELLENCE AT VAN NEST	$ 250	$ 250	$ -
ADVANCED SPLICES AND JOINTS	$ 200	$ 250	$ (50)
ADVANCED DISTRIBUTION AUTOMATION TECH	$ 200	$ 300	$ (100)
ADVANCED DISTRIBUTION CABLES	$ 200	$ 250	$ (50)
ADVANCED NETWORK SWITCHES	$ 200	$ 300	$ (100)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 50	$ 50
SUBTOTAL NETWORK EQUIPMENT RELIABILITY PROJECTS	*$ 4,705*	*$ 4,705*	$ -
FAULT LOCATING PROJECTS			
REAL TIME FAULT LOCATION SYSTEM	$ 100	$ 200	$ (100)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL FAULT LOCATING PROJECTS	*$ 200*	*$ 300*	$ (100)

RESEARCH AND DEVELOPMENT PROGRAM BUDGET
RATE YEAR ENDING 3/2012

Title	Rate Year Ending 3/12	$X(1000) Rate Year Ending 3/10	Varianc
STRAY VOLTAGE / MANHOLE EVENTS PROJECTS			
IMPROVED EARLY DETECTION OF URBAN STRAY VOLTAGE CONDITIONS	$ -	$ 100	$ (100)
ADVANCED STRAY VOLTAGE PROGRAM	$ 250	$ 150	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL STRAY VOLTAGE / MANHOLE EVENTS PROJECTS	*$ 350*	*$ 350*	$ -
OVERHEAD PROJECTS			
ADVANCED OVERHEAD (OH) EQUIPMENT	$ 150	$ 100	$ 50
ADVANCED OH DISTRIBUTION AUTOMATION TECH	$ 200	$ 150	$ 50
ADVANCED RIGHT-OF-WAY (R-O-W) MAINTENANCE TECHNIQUES	$ 50	$ 50	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL OVERHEAD PROJECTS	*$ 450*	*$ 350*	$ 100
SYSTEM OF THE FUTURE PROJECTS			
3G SYSTEM OF THE FUTURE ACTIVITIES	$ 850	$ 850	$ -
SUBMERSIBLE FAST SWITCH FOR LOAD & CAPACITY TRANSFERS	$ 750	$ 750	$ -
DISTRIBUTION FCL DEMO	$ 750	$ 750	$ -
INTEGRATION OF DATA FOR OPERATOR DECISION MAKING	$ 100	$ 100	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL SYSTEM OF THE FUTURE PROJECTS	*$ 2,550*	*$ 2,550*	$ -
TOTAL DISTRIBUTION PROGRAM	***$ 8,255***	***$ 8,255***	$ -
ENVIRONMENTAL, HEALTH AND SAFETY PROGRAM			
ENVIRONMENTAL SUSTAINABILITY	$ 500	$ 400	$ 100
PLUG-IN HYBRID ELECTRIC VEHICLE PROJECTS	$ 100	$ 200	$(100)
ADVANCED LEAK DETECTION SYSTEM	$ 50	$ 50	$ -
CORPORATE SAFETY IMPROVEMENT PROGRAM	$ 50	$ 50	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
TOTAL ENVIRONMENTAL, HEALTH AND SAFETY PROGRAM	**$ 750**	**$ 750**	$ -
CUSTOMER OPERATIONS PROGRAM			
AMR/AMI AND METERING PROJECTS			
AMR/AMI BUSINESS CASE-CONSULTANT	$ -	$ -	$ -
UNMETERED SERVICES METER DEMONSTRATION	$ -	$ 100	$ (100)
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL AMR/AMI AND METERING PROJECTS	*$ 50*	*$ 150*	$ (100)
ENERGY EFFICIENCY PROJECTS			
ENERGY EFFICIENCY AND DEMAND RESPONSE	$ 600	$ 500	$ 100
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 100	$ 100	$ -
SUBTOTAL ENERGY EFFICIENCY PROJECTS	*$ 700*	*$ 600*	$ 100
CUSTOMER SERVICE PROJECTS			
CALL CENTER OPERATIONS SYSTEMS	$ 200	$ 200	$ -
ADVANCED CUSTOMER SERVICE TECHNOLOGIES	$ 200	$ 200	$ -
THEFT OF SERVICES / COLLECTIONS SYSTEMS	$ 100	$ 100	$ -
MISCELLANEOUS SMALL PROJECTS (PROJECTS LESS THEN $100 BUDGET)	$ 50	$ 50	$ -
SUBTOTAL CUSTOMER SERVICE PROJECTS	*$ 550*	*$ 550*	$ -
TOTAL CUSTOMER OPERATIONS PROGRAM	**$ 1,300**	**$ 1,300**	$ -
TOTAL BASE PROGRAM	**$ 19,000**	**$ 19,000**	$ -

Consolidated Edison Co. of New York, Inc
Research and Development Program Budget

Project/Program Title	BASE PROGRAM
Status	ONGOING
Estimated Service Date	ONGOING

Work Description:
This is a continuation of the Research and Development base program and the development and demonstrations of hardware and systems associated with program initiatives approved in the prior rate case.

Justification:
The base program in the rate case has increased by $8,196 million in the first rate year. This increase is based upon the following assumptions:

1) Salaries for two additional engineers at $100,000 per year each.
2) Expenses for the two new engineers $14,000 per year each based upon R&D historical average.
3) $7,968,000 in program costs as detailed below:
   a) We are adding a project that was recently selected for USDOE funding entitled "Interoperability of Demand Response Resources Demonstration in NY". This increase in funding for the rate year is $150K.
   b) The R&D network reliability and monitoring initiative will develop and demonstrate an advanced primary and secondary SCADA whereby a new two-way network remote monitoring system - RMSX (Remote Monitoring System Expansion) will be developed and demonstrated. The estimated first year cost s is $1.5 million.
   c) The R&D Superconducting and Fault Current Limiter program component costs associated with the DHS project Hydra and our contract with American Superconductor is $1.5 million.
   d) EPRI is in the process of developing a nationwide SMART GRID initiative in which Con Edison has already committed to be a participant. The $1.35 million estimate is based upon our discussions with EPRI's experts on what costs would be to install the elements of a SMART GRID on several networks and circuits throughout our system.
   e) The Environmental Sustainability R&D program focuses on identifying the Company's operational impact on green house gas emissions and investigates various new technologies to achieve reductions in CO_2 and other greenhouse gas emissions. The funding during the first rate year is estimated to be $300,000.
   f) The Energy Efficiency and Demand Response R&D program involves research on energy efficiency and demand response, as well as greenhouse gas reduction-from a dynamic, integrated systems or networked perspective that simultaneously addresses electric energy savings, demand reductions, and peak load management. Funding is estimated to be $300,000 in the first year.

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g) EPRI base program funding has increased by $970,000 from 2007 to 2008. This increase is do to funding of new programs such as energy efficiency; Global Climate change, Plug-in Hybrid electric vehicles and sensor development.
h) Plug-in hybrid electric vehicle study on the infrastructure impacts of these vehicles on our systems. This estimate is based upon a contract with EPRI for $200,000.
i) Demonstration of the newly developed un-metered services monitoring device estimates to be $300,000. This estimate is based upon installing meters on all cable TV services in Brooklyn.
j) Demonstration of submersible fast switches $750,000 estimate is based upon the number of switches expected to be installed as stated in the RADPAR.
k) Another proposed project addresses the need of developing an analytical tool for better operator decision making by integrating information from currently disparate data sources into an integrated system model In 2006 and 2007, the plant model for one network in Manhattan was being built as a pilot. In 2009 - 2011, the demonstration is expected to be extended to Brooklyn, Queens and the Bronx. The R&D effort will demonstrate the integration of machine learning to evaluate and predict the performance of the electrical infrastructure based on real-time information run against the model. The $500,000 estimate for this additional scope of work is based upon an estimate from the contractor CALM Energy.

Estimated Completion Date:
On Going

Status:
On going program

Funding ($000)

Historical Year (2007)	Forecast RYE 2009	Forecast RYE 2010	Forecast RYE 2011	Forecast RYE 2012	Forecast Total RYE 2010 - 2012
10,804	19,000	19,000	19,000	19,000	57,000