BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of

Consolidated Edison Company of New York, Inc.

Case 06-G-1332

March 2007

Prepared Testimony of:

Michael W. Wayand
Utility Engineer 3
Policy Section
Office of Gas & Water
State of New York
Department of Public Service
Three Empire State Plaza
Albany, New York 12223-1350

1 Q. Please state your full name and business
2 address.
3 A. Michael W. Wayand, Three Empire State Plaza,
4 Albany, NY 12223.
5 Q. Mr. Wayand, by whom are you employed and in what
6 capacity?
7 A. By the Department of Public Service of the State
8 of New York. I am a Utility Engineer 3 on the
9 staff of the Office of Gas & Water, Policy
10 Section.
11 Q. Please state your educational background and
12 professional experience.
13 A. I received a Bachelor of Science degree in
14 Mechanical Engineering from Union College in
15 Schenectady, New York in 1977. I have been
16 employed continuously since that time in the
17 Department of Public Service as an engineer in
18 the Office of Gas & Water. My duties in the
19 Policy Section relate to gas utility matters,
20 including the review of rate filings.
21 Q. Have you previously testified before the
22 Commission?
23 A. Yes.
24 Q. What is the purpose of your testimony?

1 A. I will address the Research & Development (R&D)
2 testimony of company witness Edward Ecock.
3 Q. Do you have any exhibits?
4 A. Yes. I am sponsoring three exhibits, labeled
5 Exhibit ___(MWW-1), Exhibit ___(MWW-2) and
6 Exhibit ___(MWW-3).
7 Q. What is the company's proposal regarding
8 internal R&D program expenditures in the rate
9 year?
10 A. As described on page 7 of Mr. Ecock's testimony,
11 as well as shown on his Exhibit ___EE-1,
12 Schedule 1, Page 3 of 4, the company has a
13 planned expenditure of $3.826 million in the
14 rate year. However, this figure does not
15 include the general escalation (inflation) rate
16 that the company's Accounting Panel applied to
17 test year Operating & Maintenance Expenses
18 (including R&D) in calculating the rate year
19 revenue requirement. Adding this 5.04%
20 escalator to Mr. Ecock's number results in a
21 rate year internal R&D program expense of $4.019
22 million.
23 Q. What R&D projects would the internal program
24 consist of in the rate year?

1 A. As shown on Mr. Ecock's Exhibit ___EE-1,
2 Schedule 1, Pages 1 through 3 of 4, most of the
3 expenditures would be used to fund 53 projects
4 ranging in cost from $3,000 to $250,000 in the
5 rate year. Many of the highest cost projects
6 are related to trenchless technology projects as
7 discussed by Mr. Ecock on pages 8 through 10 of
8 his testimony.
9 Q. Do you have any recommendations regarding the
10 company's proposal?
11 A. Yes. Due to insufficient justification by the
12 company, I recommend that the rate case
13 imputation for the internal R&D program be set
14 at the historic three year average annual
15 expenditure of $1.820 million, which is a
16 downward adjustment of $2.199 million to the
17 company's proposal. As explained in more detail
18 on pages 5 and 6 of my testimony, any actual
19 expenditures in the rate year above or below
20 this imputation should be subject to deferral
21 accounting.
22 Q. What is the basis for your recommendation?
23 A. I note that 15 of the 53 projects in Exhibit
24 ___EE-1 are shown as each costing more than

1 $50,000 in the rate year. These 15 projects
2 represent approximately 75% of the rate year
3 cost of the 53 projects combined. I asked the
4 company to provide the project cost/benefit
5 calculations for 14 of the 15 projects; only one
6 had been included in the company's workpapers.
7 As shown in the company's response to a Staff
8 information request which I am sponsoring as
9 Exhibit ___(MWW-1), cost benefit analyses have
10 been performed for only two of the projects
11 requested. The response states that cost
12 benefit analyses are generally performed for
13 projects which are aimed at reducing O&M costs,
14 and sometimes reliability projects, "shortly
15 before expenditures are about to commence." The
16 lack of cost benefit analyses under these
17 circumstances makes it difficult, if not
18 impossible, for Staff to verify that the need
19 for all of these projects is justified.
20 I also requested that the company provide
21 workpapers "showing how each total cost figure
22 was developed" for the 15 highest cost projects.
23 As shown in the company's response to Staff's
24 information request, which I have included as

1 Exhibit ___(MWW-2), the company's response
2 consisted of a sentence or two describing how
3 the cost was developed. The inadequacy of this
4 response further illustrates the company's
5 failure to justify these projects.
6 Q. Based on the above lack of justification, what
7 is your recommendation?
8 A. I recommend that the company be allowed to
9 impute the historic three year average annual
10 expenditure for internal R&D projects, adjusted
11 upward for inflation. As shown in my Exhibit
12 ___(MWW-3), this results in a rate year
13 imputation of $1.820 million, which is $2.199
14 million below the company's request. Actual
15 expenditures in the rate year above this amount
16 should only be permitted subject: (1) to a
17 demonstration to staff, and approval by the
18 Commission, that such expenditures were
19 justified and prudent; and (2) to future
20 recovery via deferral accounting, up to a
21 maximum of $2.199 million over and above the
22 $1.820 million imputation. Should actual
23 expenditures be below the $1.820 million
24 imputation, the amount not expended should be

1 deferred and returned to customers.

2 Q. Does this conclude your testimony at this time?

3 A. Yes.

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Prepared Exhibits of:

Michael W. Wayand
Utility Engineer 3
Policy Section
Office of Gas & Water
State of New York
Department of Public Service
Three Empire State Plaza
Albany, New York 12223-1350

Company Name: Con Edison
Case Description: Rate Filing
Case: 06-G-1332

Response to DPS Interrogatories – Set Staff3
Date of Response: 12/21/2006
Responding Witness: Ecock

Question No. :54
Regarding your workpapers containing the Project Cost/Benefit Calculation for the "Demonstration to Advance CIPL with Steam Curing for Gas Main Rehabilitation", also provide the cost/benefit calculations for each of the following additional projects listed in your Exhibit EE-1: a) Evaluation of Broadband in Gas. b) Evaluate and Demonstrate Facility Locator Devices. c) Technology Deployment and Implementation (TDI) Program. d) Adapting Hammerhead and Consplit Equipment and Demonstration. e) Adapting Hammerhead and Consplit Equipment and Demonstration. f) Live Steel Main Inspection and Repair System (GRISLEE). g) GPS for Facility Locating h) Development of an Automated Logging System for Gas Leak Surveys. i) Demonstration to Advance Subline for High-Pressure Gas Main Rehabilitation. j) Evaluate CIP Liners for retaining Undermined Cast Iron Gas Main. k) Feasibility Study of Using the Subline Process for High-Pressure Gas Main Rehabilitation. l) Feasibility Study of Alternative Methods to Rehabilitate Leaking Gas Mains. m) Develop and Demonstrate Internal Cast Iron Joint Sealing Robot for Large Diameter Mains. n) Development of an Emergency Main Shutdown System.

Response:

As indicated on page 3 of my testimony, there are three program aims for R&D projects. The Company generally performs cost benefit analyses on the first category of projects which are aimed at reducing or minimizing O&M costs. The Company sometimes performs cost benefit analyses for reliability projects. The Company does not perform cost benefit analyses for the third category of projects (e.g., enhancing environmental excellence). Cost benefit analyses are performed if the projects are initially expected to cost in excess of $50,000, shortly before expenditures are about to commence. From the list provided in the question, only two projects (i) and (m) meet these qualifications. See attached for the cost-benefit analysis for these two projects.

Question 54 i

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RESEARCH AND DEVELOPMENT PROJECT COST / BENEFIT ANALYSIS

PROJECT TITLE	***MILLENNIUM FUND*** **16" Through 36" Cast Iron Joint Sealing Robot (CISBOT) Development and Demonstration (Phase 2)**	COST SEG. # 92628 PROJECT STATUS: [X] NEW [ ] COMPLETED [ ] REVISED (OR UPDATED)

APPLICATION OF RESULTS (CHECK ONE)

- [ ] ACTUAL PAST OR PRESENT USE
- [X] FIRM PLANS TO USE
- [ ] INDIRECT (BENEFIT)
- [ ] POTENTIAL / NEARTERM (< 2 YEARS)
- [ ] POTENTIAL / FUTURES (> 2YEARS)
- [ ] NOT APPLICABLE (WHY)

NATURE OF BENEFIT (CHECK ALL THAT APPLY)

- [X] COST AVOIDANCE
- [X] COST SAVING
- [ ] STRATEGIC ISSUE
- [ ] OTHER
- [ ] REGULATORY ISSUE
- [ ] REFERENCE / UPDATE
- [ ] JOINT OWNER / POWER POOL
- [ ]

BENEFIT DUE TO INCREASE / DECREASE IN

- [X] CAPITAL COST
- [X] CONSTRUCTION LEADTIME
- [ ] EQUIPMENT LIFE
- [ ] IMPROVED DISPATCH
- [ ] FUEL COST
- [ ] THEFT OF SERVICE
- [X] EMISSIONS
- [ ] QUALITY OF DECISION
- [ ] QUALITY OF REGULATORY / LEGISLATION DECISIONS
- [X] O & M COST
- [ ] RELIABILITY / AVAILABILITY / OUTAGES
- [ ] HEAT RATE
- [X] SYSTEM LOSSES
- [ ] LABOR PRODUCTIVITY
- [X] ENVIRONMENTAL / FINANCIAL RISK
- [ ] OCCUPATIONAL HEALTH AND SAFETY
- [ ] INFORMATION QUALITY AND AVAILABILITY
- [ ] OTHER

BENEFIT TO COMPANY - QUALITATIVE OR QUANTITATIVE

Qualitative benefits include: 1) elimination of environmental concerns with sandblasting against lead face of joint and methane leaks in the atmosphere 2) minimizing roadway disruption by use of in-pipe robotics, especially in heavy traffic areas typical for larger diameter gas mains.

Quantitative benefits include: 1) substantial reduction in the unit price to seal joints in this size range by replacing the individual encapsulation method with the multiple robotic CISBOT method, and 2) focusing use of robotic system on "prior-to paving" locations throughout the entire distribution system where it would be desirable to eliminate returning for re-excavation. Calculations are detailed on the next sheet; click tab below.

PROBABILITY THAT BENEFITS WILL BE REALIZED [X] HIGH [ ] MED [ ] LOW

PREPARED BY	Anthony J. Hranicka Anthony Hranicka - R&D Project Manager	5/2/2003 DATE
APPROVED BY	Tony Codner Anthony Codner - R&D Department Manager	5/2/2003 DATE
CONCURRED BY	John Sangirardi (A John Sangirardi - Sponsoring Section Manager	April 28 2003

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RESEARCH AND DEVELOPMENT PROJECT COST / BENEFIT CALCULATION

PROJECT TITLE	***MILLENNIUM FUND*** 16" Through 36" Cast Iron Joint Sealing Robot (CISBOT) Development and Demonstration (Phase 2)	COST SEG. # 92628

CALCULATIONS

COST of R&D = from face sheet of RADPAR

QUANTITATIVE BENEFITS=
Given $6,000 per joint by encapsulation which includes the possibilities of sheeting up to 10' deep, dry holes, and night work
Given 245 joints for 16" to 24" diameter and 22 joints for 3 0 to 3 6 diameter were sealed in 2002 per GLMS
Given 2.5 joints are sealed by encapsulation to clear a normal leak ticket
Given 6 joints are sealed on typical prior-to-paving jobs by encapsulation
Assuming 20% of 2002 joints sealed were due prior-to-paving work
Assuming a typical migration pattern for the depths of this size mains is up to 150' long
Given CISBOT robotic sealing production will be 3 joints per day, then
the unit cost for CISBOT to seal 150' of main or 13 joints will be $2,000/joint for 16' to 24" d., and $2,450/joint for 30" to 36' d.
including excavation, sheeting, restoration, fitting purchase and installation and tapping, and all robot costs
Assuming one 25' x 40' restoration costing $13,700 per year will be required to encapsulate a new leak post-paving
Then Encapsulation = 245/2.5 x .2 x $6,000/joint x 6 joints = $705,600 per year for 16' to 24' diameter
and = 22/25 x .2 x $6,000/joint x 6 joints = $63,400 per year for 30' to 36' diameter B
Then CISBOT = 24512.5 x .2 x $2,000/joint x 13 joints = $509,600 per year for 16" to 24" diameter
and = 22/2.5 x .2 x $2,450/joint x 13 joints = $56,000 per year for 30" to 36" diameter
Therefore $705,600 + 63,400 + 13,700 = $782,700 per year by Encapsulation
Minus $509,600 + 56,000= $565,600 per year by CISBOT
Benefit = $217,100 per year

	2002	2003	2004	2005	2006	2007	TOTAL
COST OF R&D	55,000	300,000	95,000	50,000	0	0	$500,000

COST OF IMPLEMENTATION	2002	2003	2004	2005	2006	2007	TOTAL
	0	0	0	0	0	0	$0

	LABOR	MATERIAL	OTHER ($)	TOTAL
CURRENT COST / YEAR				
POTENTIAL ANNUAL SAVING (%)				
ESTIMATED SAVING				

INFLATION	2.80%
DISCOUNT	8.32%
PRES VAL YR	2004
INITIAL YEAR	2002

COST/BENEFIT ANALYSIS

CURRENT DOLLARS THROUGH	2002
CONSTANT DOLLARS AFTER	2002

YEAR	COST ($)	BENEFIT ($)	BENEFIT (%)	CUMMUL. PRESENT VALUE COST	CUMMUL. PRESENT VALUE BENEFIT	BENEFIT/COST RATIO
2002	55,000	0	0%	64,533	0	0.0
2003	300,000	0	0%	389,493	0	0.0
2004	95,000	108,550	50%	484,493	108,550	0.2
2005	50,000	217,100	100%	531,945	325,650	0.6
2006	0	217,100	100%	531,945	542,750	1.0
2007	0	217,100	100%	531,945	759,850	1.4
2008	0	217,100	100%	531,945	976,950	1.8

Question 54 m

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RESEARCH AND DEVELOPMENT PROJECT COST / BENEFIT ANALYSIS

PROJECT TITLE	DEMONSTRATION TO ADVANCE SUBLINE FOR HIGH-PRESSURE GAS MAIN REHABILITATION	COST SEG. # 92 PROJECT STATUS: [X] NEW [ ] COMPLETED [ ] REVISED (OR UPDATED)

APPLICATION OF RESULTS (CHECK ONE)

- [X] ACTUAL PAST OR PRESENT USE
- [ ] FIRM PLANS TO USE
- [ ] INDIRECT (BENEFIT)
- [ ] POTENTIAL / NEARTERM (< 2 YEARS)
- [ ] POTENTIAL / FUTURES (> 2YEARS)
- [ ] NOT APPLICABLE (WHY)

NATURE OF BENEFIT (CHECK ALL THAT APPLY)

- [X] COST AVOIDANCE
- [X] COST SAVING
- [ ] STRATEGIC ISSUE
- [ ] OTHER
- [ ] REGULATORY ISSUE
- [ ] REFERENCE / UPDATE
- [ ] JOINT OWNER / POWER POOL
- [ ]

BENEFIT DUE TO INCREASE / DECREASE IN:

- [X] CAPITAL COST
- [X] CONSTRUCTION LEADTIME
- [ ] EQUIPMENT LIFE
- [ ] IMPROVED DISPATCH
- [ ] FUEL COST
- [ ] THEFT OF SERVICE
- [ ] EMISSIONS
- [ ] QUALITY OF DECISION
- [ ] QUALITY OF REGULATORY / LEGISLATION DECISIONS
- [X] O & M COST
- [X] RELIABILITY / AVAILABILITY / OUTAGES
- [ ] HEAT RATE
- [ ] SYSTEM LOSSES
- [ ] LABOR PRODUCTIVITY
- [ ] ENVIRONMENTAL / FINANCIAL RISK
- [ ] OCCUPATIONAL HEALTH AND SAFETY
- [ ] INFORMATION QUALITY AND AVAILABILITY
- [ ] OTHER

BENEFIT TO COMPANY - QUALITATIVE OR QUANTITATIVE:

The cost comparison of open trench replacement for the full length versus Subline rehabilitation from multiple small excavations will be the basis of this analysis. Future savings from productivity improvements in the economies of equipment mobilization from England, the EnviroJet cleaning/decontamination method used, and the superpurger for inerting will be realized from this Gas R&D demonstration.

PROBABILITY THAT BENEFITS WILL BE REALIZED: [X] HIGH [ ] MED. [ ] LOW

BENEFITS NOT QUANTIFIABLE BECAUSE

PREPARED BY	Tony Hranicka	Project Manager	8/29/05 DATE
APPROVED BY	Johnny Wong	Engineering Supervisor	8/29/05 DATE
CONCURRED BY	Tony Mancino	Section Manager	8/29/05 DATE

29-Aug-05

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RESEARCH AND DEVELOPMENT PROJECT COST / BENEFIT CALCULATION

PROJECT TITLE	DEMONSTRATION TO ADVANCE SUBLINE FOR HIGH-PRESSURE GAS MAIN REHABILITATION	COST SEG. # 92

CALCULATIONS

COST of R&D = $450,000 for materials and PIM's T&E + $15,000 for EnviroJet cleaning = $465,000

COST to IMPLEMENT = Gas Ops to provide launch/reception pits, gas main work and road restoration = $406,000

BENEFIT = cost to open trench - cost to Subline = $1,745,000 - $871,000 = $874,000 in 2005

BENEFIT PROJECTION =

Every year thereafter assume a 5% increase in open trench cost due to inflation, and a one time 10% decrease in Subline process costs from improved efficiencies starting in 2006. Both these apply to implementation assuming the same amount of pipe replacement per year.

	2005	2006	2007	2008			TOTAL
COST OF R&D	465,000	0	0	0			$465,000

COST OF IMPLEMENTATION	2005	2006	2007	2008			TOTAL
	406,000	784.000	784,000	784.000			$2,758,000

	LABOR	MATERIAL	OTHER ($)	TOTAL
CURRENT COST / YEAR				
POTENTIAL ANNUAL SAVING (%)				
ESTIMATED SAVING				

INFLATION	2.80%
DISCOUNT	8.32%
PRES VAL YR	2005
INITIAL YEAR	2005

COST/BENEFIT ANALYSIS

CURRENT DOLLARS THROUGH	2005
CONSTANT DOLLARS AFTER	2005

YEAR	COST ($)	BENEFIT ($)	BENEFIT (%)	CUMMUL. PRESENT VALUE COST	CUMMUL. PRESENT VALUE BENEFIT	BENEFIT to COST
2005	871,000	874,000	100%	871,000	874,000	1.0
2006	784,000	1,049,000	100%	1,633,646	1,802,411	1.1
2007	784,000	1,140,000	100%	2,375,519	2,690,741	1.1
2008	784,000	1,236,000	100%	3,097,186	3,540,572	1.1

Company Name: Con Edison
Case Description: Rate Filing
Case: 06-G-1332

Response to DPS Interrogatories – Set Staff5
Date of Response: 01/08/2007
Responding Witness: Ecock

Question No. :80
Regarding your Exhibit EE-1, provide for each of the projects listed below the total projected R&D cost (from commencement to completion). Also provide work papers showing how each total cost figure was developed. a) Evaluation of Broadband in Gas b) Evaluate and Demonstrate Facility Locator Devices c) Technology Deployment and Implementation (TDI) Program d) Adapting Hammerhead and Consplit Equipment and Demonstration e) Demonstration of Subcoil f) Live Steel Gas Main Inspection and Repair System (GRISLEE) g) GPS for Facility Locating h) Development of an Automated Logging System for Gas Leak Surveys i) Demonstration to Advance Subline for High-Pressure Gas Main Rehabilitation j) Demonstration to Advance CIPL with Various Curing Methods for Gas Main Rehabilitation k) Evaluate CIP Liners for Retaining Undermined Cast Iron Gas Main l) Feasibility Study of Using the Subline Process for High-Pressure Gas Main Rehabilitation m) Feasibility Study of Alternative Methods to Rehabilitate Leaking Gas Mains n) Develop and Demonstrate Internal Cast Iron Joint Sealing Robot for Large Diameter Mains o) Development of an Emergency Main Shutdown System

Response:

In addition to workpapers previously provided, see attached table containing projected costs and explanation of the development of such costs. See also the Company's response to Staff 54.

Response to Questions 80 and 81

Item	Project Description	Total Project R&D Cost	Cost Development	Cost Apportionment
a	EVALUATION OF BROADBAND IN GAS	$1,000,000	The estimate is based on funding basic research and application of broadband to gas piping for several years, and then demonstrating the application on our system.	An estimate of $100,000 per year for the first few years was arrived at to fund the basic research. Two additional years of demonstration costs at $350,000/year is expected.
b	EVALUATE AND DEMONSTRATE FACILITY LOCATORS	$300,000	An estimate of $100,000 per year is expected to cover the cost of purchasing the locating devices, and the labor to field test and verify.	The total project estimate of $300,000 is spread evenly over a three-year period. Dependent on scheduling of field tests and verifications, the actual costs may underrun or overrun the estimates for that particular year.
c	TECHNOLOGY DEPLOYMENT AND IMPLEMENTATION (TDI) PROGRAM	$1,275,000	Work papers covering proposed program were submitted previously.	Year "One" cost estimate will cover the development of the decision tool and training, with possible field demonstrations if schedule permits. Years Two and Three cover the costs for field demonstrations.
d	ADAPTING HAMMERHEAD AND CONSPLIT EQUIPMENT AND DEMONSTRATION	$750,000	An estimate of $250,000 per year is based on the cost of leasing Hammerhead equipment, and the labor (internal and external) to demonstrate and evaluate adapting Hammerhead to ConSplit to determine upsizing capabilities. Each year will evaluate different applications of the equipment.	The total project estimate of $750,000 is spread evenly over a three-year period. Dependent on scheduling of field tests and verifications, the actual costs may underrun or overrun the estimates for that particular year.
e	DEMONSTRATION OF SUBCOIL	$750,000	An estimate of $250,000 per year is based on the labor (internal and external) to demonstrate and evaluate the use of Subcoil in our gas mains. Each year will evaluate different applications of the equipment.	The total project estimate of $750,000 is spread evenly over a three-year period. Dependent on scheduling of field tests and verifications, the actual costs may under run or overrun the estimates for that particular year.

Response to Questions 80 and 81

f	LIVESTEEL GAS MAIN INSPECTION AND REPAIR SYSTEM (GRISLEE)	$750,000	The estimate is based on labor by the Gas Technology Institute (GTI) to design and incorporate upgrades to the existing robot, as well as labor to demonstrate and evaluate the new equipment.	Year One estimate of $250,000 covers vendor contract costs to perform upgrades as well as limited field testing. Year Two estimate of $250,000 covers the labor costs to demonstrate and evaluate the new equipment. Year Three estimate of $250,000 covers the costs of GTI to fine tune the equipment and perform final testing.
g	GPS FOR FACILITY LOCATING	$600,000	The estimate is based on internal labor (field work, map retrievals, system integration, etc.) to support the Gas Technology Institute (GTI) with its pilot programs.	The total project estimate of $600,000 is spread evenly over a three-year period. Dependent on scheduling of GTI work and internal labor support, the actual costs may underrun or overrun the estimates for that particular year.
h	DEVELOPMENT OF AN AUTOMATED LOGGING SYSTEM FOR GAS LEAK SURVEYS	$250,000	This is an ongoing project. The estimate is based on vendor contract costs to develop an automated logging system, as well as labor costs to verify the validity of the data.	Year One estimate of $100,000 is based on the expectation that the logging system will be completed and testing will commence. The Year Two estimate of $75,000 covers additional costs for testing and refinement of logging system by vendor. Year Three estimate of $50,000 is based on final testing and tuning of logging system by vendor.
i	DEMONSTRATION TO ADVANCE SUBLINE FOR HIGH-PRESSURE GAS MAIN REHABILITATION	$750,000	The estimate is based on labor (internal and external) costs for field testing and evaluation of Subline.	The annual estimate of $200,000 is expected to cover field testing and evaluation of the Subline process. Dependent on scheduling of field tests and evaluations, the actual costs may underrun or overrun the estimates for that particular year.
j	DEMONSTRATION TO ADVANCE CIPL WITH VARIOUS CURING METHODS FOR GAS MAIN REHABILITATION	$600,000	The estimate is based on labor (internal and external) costs for demonstrating different curing methods for CIPL technology.	The total project estimate of $600,000 is spread evenly over a three-year period. Dependent on scheduling of field tests and verifications, the actual costs may underrun or overrun the estimates for that particular year.

Response to Questions 80 and 81

k	EVALUATE CIP LINERS FOR RETAINING UNDERMINED CAST IRON GAS MAIN	$1,200,000	This is a continuation of the work started during prior rate case. The $1,200,000 estimate is based on labor (internal and external) costs for field testing and evaluation of CIP liners for 24 projects allowed for in the waiver.	The annual estimate of $200,000 is expected to cover field testing and evaluation of at least one project. Dependent on scheduling of field tests and evaluations, the actual costs may underrun or overrun the estimates for that particular year.
l	FEASIBILITY STUDY OF USING THE SUBLINE PROCESS FOR HIGH-PRESSURE GAS MAIN REHABILITATION	$500,000	The estimate is based on: internal labor costs to excavate and inspect transmission lines; design and fabrication of new adapters; engineering feasibility analysis, lab and field testing of adapters; and a limited demonstration.	Year One estimate of $150,000 is expected to cover excavation and inspection costs. Year Two estimate of $150,000 is expected to cover design and fabrication costs for adapters, and engineering feasibility analysis. Year Three estimate of $150,000 is expected to cover costs of lab and field tests of adapter, and a limited demonstration.
m	FEASIBILITY STUDY OF ALTERNATIVE METHODS TO REHABILITATE LEAKING GAS MAINS	$500,000	The estimate is based on internal labor costs to gain entry to difficult access gas mains (such as underwater crossings, and cased bridge crossings) and internally inspect using various equipment and methods in an attempt to determine the best method to repair leaking gas mains.	Years One, Two, and Three estimates of $150,000 are based on: labor costs to gain entry and inspect select piping; rental of inspection tools and equipment, and engineering evaluation. It is expected that at least one inspection and evaluation per year will be performed. Dependent on scheduling of field tests and evaluations, the actual costs may underrun or overrun the estimates for that particular year.
n	DEVELOP AND DEMONSTRATE INTERNAL CAST IRON JOINT SEALING ROBOT FOR LARGE DIAMETER MAINS	$750,000+	This is a continuation of a similar project that resulted in a robot that repaired smaller diameter mains. The estimate is based on vendor contract costs needed to complete the development of the robot, and labor costs to demonstrate and evaluate the equipment.	Year One estimate of $150,000 covers the vendor contract costs to develop a working prototype and perform limited field testing. Year Two estimate of $150,000 covers the costs for field testing and evaluating the prototype. Year Three estimate of $150,000 covers the vendor contract costs to fine tune the robot, and perform final testing.

Response to Questions 80 and 81

o	DEVELOPMENT OF AN EMERGENCY MAIN SHUTDOWN SYSTEM	$275,000	The estimate is based on labor and expenses expected to be incurred by GTI to develop such a program.	Year One estimate of $75,000 covers the vendor (GTI) contract costs to develop the equipment. Year Two estimate of $100,000 covers the vendor contract cost to complet the development and to lab test the prototype. Year Three estimate of $100,000 covers the labor costs to field test and evaluate the equipment.

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
CASE 06-G-1332
INTERNAL R&D PROGRAM EXPENDITURES

TWELVE MONTHS ENDING	HISTORIC EXPENDITURES ($000)	INFLATION ADJUSTED EXPENDITURES 6/30/05 ($000)	6/30/06 ($000)	09/30/08 ($000)
6/30/2004	$1,755	$1,801	$1,852	$1,946
6/30/2005	$1,259	$1,259	$1,295	$1,360
6/30/2006	$2,052	N/A	$2,052	$2,155
		3 YEAR AVERAGE		**$1,820**

Inflation Escalators Used:
6/30/04 to 6/30/05 = 2.63%.
6/30/05 to 6/30/06 = 2.84%.
6/30/06 to 9/30/08 = 5.04%.

Exhibit ___ (MWW-3)