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<td>Meter Purch.</td>
<td>Demand Meter /Shuntflo Meter Conversion</td>
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<td>Meter Purch.</td>
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<td>Customer Profiling Software - IT</td>
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</table>
Work Description:

This program includes the installation of piping and equipment to provide steam service to new steam customers. 2013-15 identified projects are:

- 498-528 Washington St.
- 1776 Broadway
- 1 West End Ave. (Extell Riverside Center)
- 200 W. 13th St. (St. Vincent's)
- 433 First Ave. (NYU Dental)
- 44 W. 54th St. (MOMA)
- 99 Church St.
- 41-45 E. 60th St.
- 107 W. 57th St.
- Long Island Railroad - East Side Access
- 25 Broad St.
- 440 Park Ave.
- 56 Leonard St.
- WTC Towers 2-4
- 51 Astor Place

The New Business line item also funds the Customer Profiling – IT project (see separate white paper). The funding for that project is included in the budgetary numbers listed for New Business and is not separate. In addition, later years include funding for emergent new business work and additional oil-steam conversion customers in conjunction with changing City regulations.

Justification:

- Per the Steam Tariff, the Company is required to pay for the new customer service installation within 250 ft of our steam main.

- **Alternatives:** PSC Code and Steam Tariff require the Company to provide service to customers.

- **Summary of Financial Benefits and Costs:** This program increases the customer base for the company's Steam Business Unit. Total PBR is greater than $500,000 per year based on the historical data from the last 3 years.

Status:

Ongoing

Funding ($000):

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

STEAM DISTRIBUTION CONSTRUCTION PROGRAM,

Estimated 2013 - 2017

<table>
<thead>
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<th>Project Title</th>
<th>Interference Projects (Upper and Lower Manhattan)</th>
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<tbody>
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<td>Project Number</td>
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<tr>
<td>Program Title</td>
<td>Interference</td>
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<tr>
<td>Station</td>
<td>Steam Distribution</td>
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<tr>
<td>Estimated Service Date</td>
<td>Various</td>
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</table>

Work Description:

This program consists of steam facility relocation due to interference with City of New York infrastructure projects such as water main installation, sewer main installation, street reconstruction projects, etc. The City has eminent domain of the streets of New York and whenever existing steam facilities will cause an interference issue with proposed City facilities, the company would have to relocate its facilities or pay for accommodations to avoid the interference. Increased spending for Interference projects is projected for the next few years due to the City Water Tunnel #3 projects.

Justification:

Since the City has eminent domain of the streets of New York, the City has the power to order Company facilities out of the way of the lane of the proposed City facilities.

Alternatives: There are no alternatives to this program. Since the City has eminent domain of the streets of New York, the City has the power to order Company facilities out of the way of the lane of the proposed City facilities.

Risk of No Action: The City can impose severe fines for Company facilities that are not relocated after having been ordered to do so.

Status:

Ongoing

Funding ($000):

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</table>
**Work Description:**

This program is designed to address steam leaks and upgrades of Steam Distribution System components. Steam leak repair activity includes leaks from services, valves, slip joints, trap discharge lines, mains, cooling chambers, flanges. Leaks can be in a variety of areas including piping, gaskets, packing, and welds. An upgrade of equipment such as valves and piping is done as better equipment is specified by Steam Distribution Engineering.

**Justification:**

Steam leaks will cause deterioration of the steam housing or manhole structures surrounding the leaking component. Severe leaks will propagate above ground which will cause a safety hazard to the public such as pedestrian burns from direct contact or creating an impediment to visibility which affects vehicular and pedestrian traffic. A leak can also be a sign of potential damage caused by operating abnormalities. We are mandated by the PSC to repair leaks within 6 months.

**Alternatives:** There is no alternative to repairing or replacing a component that is leaking steam. It is also a PSC mandate to repair leaks within 6 months.

**Risk of No Action:** Unmitigated steam leaks will worsen over time because the escaping steam will cut and increase the leak opening. A leak can also impact the reliability of adjacent utilities (electric, gas, telephone, etc.) in the area.

**Status:**

Ongoing

**Unit Cost:**

Historical spending for leaks (including the previous program for Cooling Chambers, Flanges, and leak related manhole rebuilds/main valve/anchor replacements) was approximately $9 million per year.

**Funding ($000):**

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**Work Description:**

This program is designed to replace internally pressurized expansion joints that are installed in the Steam Distribution System with externally pressurized expansion joints. In some cases, expansion joints can be eliminated altogether. Steam Distribution intends to systematically replace 8 to 13 non-leaking internally pressurized expansion joints per year.

**Justification:**

Bellows expansion joints are flexible components necessarily installed in the steam piping system to absorb thermal growth. Failure of the bellows on an internally pressurized expansion joint results in an uncontrolled and potentially catastrophic leak, while an externally pressurized joint would mitigate this situation to a controlled leak.

- **Alternatives:** The alternative is to continue using the internally pressurized expansion joints.
- **Risk of No Action:** The uncontrolled and potentially catastrophic leak from internally pressurized expansion joint failures can cause serious damage to adjacent infrastructure and/or severe injuries to the public and company personnel.
- **Summary of Financial Benefits and Costs:** The mitigation of potential risks associated with the catastrophic failure can yield significant cost savings to the company.
- **Project Relationships:** Eliminating and reinforcing existing anchors may allow for the elimination of some expansion joints. Thus, the anchor Replacement/Reinforcement Program may be related to this program in certain cases.

**Status:**

Ongoing

**Unit Cost:**

Based on historical expenditures, the unit cost for replacement of an expansion joint is $92,000.

**Funding ($000):**

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Project Title: Manhole Rebuild
Project Number: 2SD1431
Program Title: System Reinforcement
Station: Steam Distribution
Estimated Service Date: Various

Work Description:

This program is designed to rebuild deteriorated manholes or eliminate manholes. Steam manholes have a 10 to 30 year life depending on roadway traffic and subsurface conditions (particularly ground water). Deteriorated manholes must be rebuilt to maintain system integrity and for the safety to employees entering these structures. In addition, manholes must be rebuilt so that mandatory PSC inspections can be performed. In 2012, there were 56 manholes identified as in poor condition. Steam Distribution intends to rebuild 8 to 14 manholes per year that are in poor condition or are required to be rebuilt due to steam leak.

Justification:

This program will address all of the issues stated above. Based on each individual case, the decision will either be to install a new manhole, rebuild the existing manhole in its entirety, rebuild the manhole in part, or eliminate the manhole.

- **Alternatives:** The alternative is to leave the manhole in its existing condition.
- **Risk of No Action:** Deteriorated manhole would prevent personnel entry for repair work of the steam piping and components. Structurally compromised manhole would also prevent operating valves necessary for the maintenance of the steam system and could allow water infiltration.

Status:

Ongoing

Unit Cost:

Based on historical expenditures, the unit cost for rebuilding a manhole is $95,600.

Funding ($000):

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Project Title: Main Valve Replacement  
Project Number: 2SD1441  
Program Title: System Reinforcement  
Station: Steam Distribution  
Estimated Service Date: Various

Work Description:

This program is designed to replace the Main Valves leaking through in the steam system in addition to the valves that are inoperable and severely corroded. Steam Distribution estimates that 5 valves will need to be replaced per year.

Justification:

This program is required to ensure proper protection and isolation during main shut offs. Not replacing a malfunctioning valve will cause the area of a shutoff to increase and thereby affect service to more customers than normally required.

- **Alternatives:** A valve leaks through because the gate and seat is severely worn or cut by steam. These valves cannot be repaired. Any work on the system that required isolation would have to be done with the leak through which will impact the quality of welds. Otherwise, full isolation could be achieved by dropping back to an adjacent valve but this would impact additional customers.

- **Risk of No Action:** Additional customers will be impacted due to drop backs and in some cases severe leak through could result in cancellation of planned work that required isolation.

- **Summary of Financial Benefits and Costs:** Valves that operate properly and do not leak through will reduce labor and improve work and weld quality.

- **Non-financial Benefits (if applicable):** Replacement of faulty main valves will allow maintenance to be performed more efficiently and make the system more reliable.

**Status:**  
Ongoing

**Unit Cost:**  
Based on historical expenditures, the unit cost for replacing a main valve is $69,000.

**Funding ($000):**

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Work Description:

This program is designed to replace anchors that have deteriorated. These anchors are located in the bottom of manholes and are exposed to heat and water conditions that cause these steel anchors (some with concrete bases) to deteriorate over time. New anchors that are installed will be coated and will be placed on a concrete pedestal to increase their life expectancy. Through September of 2012, there are approximately 104 anchors identified as in poor condition. Steam Distribution intends to replace 4 to 8 anchors per year that are either in poor condition or required to be replaced as part of various other programs.

Justification:

Under circumstances when an anchor is in poor condition, the rebuilding of the anchor is necessary. Each case may or may not involve steam main work. Additionally, the steel components of the anchors will be coated with an anti-corrosion coating to prolong the life of the anchor.

- **Alternatives**: An alternative is to reinforce a compromised anchor with the use of structural steel beams installed from the steam piping/components to the walls of the manhole at locations where the anchor is inside a manhole. However, installing these reinforcement beams inside a manhole will decrease the amount of space inside the already congested structure which will limit access and movement inside the manholes. Additionally, the effectiveness of these beams will be dependent on the walls of the manholes and at locations where the manhole itself is in poor condition, this alternative is not possible.

- **Risk of No Action**: A compromised anchor can allow the pipe to move beyond the limits of the expansion joints. An over-compression or over-extension of the expansion joint may cause it to leak.

Status:

Ongoing

Unit Cost:

Based on historical expenditures, the unit cost for replacing a main valve is $126,200.

Funding ($000):

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Project Title: Pump Manhole Electrical Upgrade
Project Number: 1SD1601
Program Title: System Reinforcement
Station: Steam Distribution
Estimated Service Date: Various

**Work Description:**

The steam system has 86 pumps installed in areas where there is groundwater or tidal water infiltration into steam structures. The Pump Manhole Electrical upgrade is to install new high temperature pumps plus various electrical components inside these pump manholes to bring them up to current electrical standards and codes. These pumps are specially designed to withstand the harsh environment of the steam manholes. The program may also include building another structure adjacent to the steam structure to house some of the pumps. Pumps are critical to prevent water accumulation in steam manholes, which can lead to water-hammer. The electrical wiring and conduit in the existing manholes are in a much degraded condition presently. Exposed wiring in manholes endangers mechanics during manhole entry and it can also endanger the public by contributing to stray voltage problems. Isolation transformers will be installed as part of the upgrade to prevent stray voltage issues.

**Justification:**

Provide a pump that can withstand the high temperatures, humidity and harsh environment of our manholes to replace the current pump that fails at a very high rate over a very short period of time. Upgrade wiring and other electrical components to meet current electrical standards and code and remove existing degraded wiring and components. Exposed wiring in manholes endangers mechanics during manhole entry and can endanger the public by contributing to stray voltage. In addition, remove a potential source for water-hammer due to a failed pump.

- **Alternatives:** The alternative is to leave the current setup which presents a safety hazard for employees and puts the system at risk of a water hammer event.

- **Risk of No Action:** The risk of an electric shock is increased. In addition to that, a pump failure could contribute to a water hammer event.

**Funding ($000):**

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Work Description:

Adopt the Construction Management’s Layout Tracking application for use by Steam Construction to track all construction work and link payment and job status information to the SOMIS system. This includes the use of the Construction Management Job Tracking application and the Contractor Payment Application (COMPASS). Various cost management reports will be required.

Justification:

Currently:

- Steam is tracking all construction jobs with an independent Access data base. Data is not shared with the SOMIS System. Update of the construction status to the SOMIS is a manual process.

- The Construction Management's Layout Tracking application will allow us to remotely update our job status and enter required Contractor Field Observation Report and CA&I Daily Log Report directly into our database.

- The Construction Management's Layout Tracking System will link to the Company payment system – COMPASS as well. This includes the opening ticket, cut sheet and T&E sheet which will simplify the payment process.

- Alternatives: Continue to manually update SOMIS and the Construction Access database.

- Risk of No Action: Continue to operate as is.

- Non-Financial Benefits and Costs: Efficiency improvement for job tracking - A single update will populate all relevant systems. Currently the inspector updates an activity sheet which is then manually transferred both to the Access Database and then again to COMPASS.

Status:

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Project Title | Steam Pipeline Integrity Program  
Program Title | System Reinforcement  
Station | Steam Distribution  
Estimated Service Date | Various  

**Work Description:**

The purpose of this program is to systematically manage the safety and integrity of the piping on the Steam Distribution System. This program will consist of threat and risk identification, baseline assessment and the remediation and prevention of piping failures. This will include but is not limited to internal inspection of the steam piping, examining past failures, replacing piping of certain age that have been known to be laminated piping, and the reconfiguration of steam piping.

**Justification:**

This program will allow us to proactively address issues and work them on a planned rather than emergency basis.

- **Alternatives:** An alternative is not to incorporate this program and reactively address issues as they come up.
- **Risk of No Action:** Addressing issues reactively will result in unscheduled excavations. The associated leak repair activities may adversely affect traffic, the public, and steam customers.

**Status:**

Ongoing

**Funding ($000):**

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Work Description:
Installation of piping reinforcements by:

1) Enhancing existing mains from distribution to transmission rating
2) Increasing diameter of existing mains
3) Installing new mains
4) Emergent work to reduce the “bottle-neck” condition in the steam distribution system
5) Upgrading main to eliminate impact of operational risk

Justification:
The steam system has some existing and future generation capacity that is bottled by not having the ability of getting to the areas where it is needed particularly during peak load days. In addition, higher than desired pressure differentials exist in the steam distribution system due to the sizing and capacity of the existing infrastructure. The steam that is least expensive to generate cannot always get to the lowest pressure areas of the system. This requires steam that is higher in cost to generate being used to supply these areas. The higher than desired pressure drops leads to increased chances of low pressure incidents.

- **Alternatives**: An alternative is not to incorporate this program. This is not recommended due to the bottling of generation capacity and unbalancing of pressures throughout the system that could result particularly on peak days.

- **Risk of No Action**: Without addressing the system generation capacity issues, the steam system will experience greater risk of low pressure incidents on peak load days and lost of opportunity to provide steam to our customers with lower costs.

Status:
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Funding ($000):

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</table>
Work Description:

This program is part of the Steam Incident Action Plan. This program is designed to install instrumentation in steam manholes throughout Manhattan to remotely monitor real-time trap operation and steam manhole water infiltration or flooding conditions. This program includes the installation of water level monitoring in priority structures and pump locations as well as trap monitoring in all 834 trap locations. The field devices are wired to an RTU and the signals from this device are transmitted wirelessly to a computer system. The monitoring of water levels and pumps will allow Steam Operations to prioritize their response during rain events. The monitoring of traps will alert the Steam Troubleshooter Dispatcher if any traps become clogged or if traps are valved out.

Justification:

This project is mandated by the PSC. There are two thousand steam manholes that house vital components such as steam traps, main valves, slip joints and pumps. These system components require periodic maintenance and inspection so that they function properly and ensure that steam is delivered safely to the customers. A major detriment to their proper operation is when conditions arise where water infiltrates the manholes, either during a rainstorm or a water main break. This could lead to a potentially dangerous water hammer condition. At this time, there is no remote monitoring process in place for tracking steam trap functionality or water levels, nor for automatically alerting Steam Operations.

Because of the 41st Street Steam Incident on July 18, 2007, several investigations and studies were initiated to identify causes preceding and leading up to the event. It was found that several factors contributed to the steam rupture on that date. The Company will address some of these factors by purchasing and installing instrumentation to measure steam and trap temperatures, and manhole water levels. This information will be retrieved by remote telemetry units (RTU's) installed at each field location. The data will then be transmitted to a server where it can be stored and displayed real-time to the Steam Troubleshooter Dispatchers at 16th Street or monitored for performance and reliability.

Alternatives: If a Remote Monitoring System is not implemented, then field crews and other support organizations will be needed to physically travel along the Steam Distribution System to monitor trap performance and observe whether or not there is water infiltration in all the priority and critical steam structures. An alternative to the existing scope of work is to reduce the number of steam structures to be monitored. However, the enhancement program has already optimized the system. Since this is a PSC mandate, the only realistic alternative is to spread the installation of this system out over a longer period of time.

Risk of No Action: No action is not a viable alternative solution. Installation of a remote monitoring system is mandated by the Public Service Commission. The risk of another steam main rupture incident is unacceptable because of the potential risk to lives and property.

Summary of Financial Benefits and Costs: Real-time remote monitoring of trap and manhole conditions can potentially reduce costs that result from the labor intensive activities.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Remote Monitoring</th>
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<tbody>
<tr>
<td>Project Number</td>
<td>Z08-9085-M, 8SD1331</td>
</tr>
<tr>
<td>Program Title</td>
<td>System Reinforcement (Steam Incident Recommendation and Action Plan)</td>
</tr>
<tr>
<td>Station</td>
<td>Steam Distribution</td>
</tr>
<tr>
<td>Estimated Service Date</td>
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</tbody>
</table>


performed during a significant rain storm. More timely response to flooded manholes and malfunctioning traps will also help reduce the steam Variance.

- **Non-financial Benefits (if applicable)**
  Real-time remote monitoring of trap and manhole conditions significantly enhances the safety and reliability of the steam distribution system.

**Status:**

Ongoing - There are currently 546 RTU locations installed out of a total scope of approximately 849 locations.

**Funding ($000):**

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Project Title: Infrastructure Condition Projects
Project Number: 23252-09, 9SD1121
Program Title: System Reinforcement (Steam Incident Recommendation and Action Plan)
Station: Steam Distribution
Estimated Service Date: Various

Work Description:
This program is part of the Steam Incident Action Plan. The purpose of the infrastructure condition project is to make improvements to the steam system infrastructure to prevent water infiltration into the subsurface steam structures. In addition, in the event of high ground water or tidal areas, this project will ensure that water infiltration into steam structures does not lead to accumulation in those structures and potential contact with the steam main. If the water comes in contact with the steam pipe excessive condensate can be produced and this can cause condensate buildup in the main.

Justification:
Some sections of the system are located near high water table areas beneath the streets of Manhattan. Over time, these concrete structures deteriorate and allow water from the environment to come in contact with the steam main. When the contact occurs, water outside of the main boils and removes latent energy from steam within the pipe, causing the steam to condense rapidly, and lowering the temperature of the condensate sometimes by as much as 40°F. Waterhammer phenomenon can happen within the steam pipe due to excessive condensate formation and subcooling as a result of transfer of energy from steam to water outside of the pipe. Excessive condensate can also pool and cool at low points within a steam main where drainage was not or could not be provided, increasing the chance of possible waterhammer event with sufficient water infiltration.

- Alternatives: One alternative is to leave the infrastructure in its existing condition. Water can infiltrate into these infrastructures and comes into contact with steam pipe, thus causing the formation of vapor. Furthermore, vapor that permeates onto the street can obstruct traffic, creating hazards for both drivers and pedestrians. The deteriorated housing can also allow heat to escape and cause damage to the street in the form of rolled asphalt. Another alternative is to just install drains from manholes to sewer to remove water, without performing in-situ insulation or structure improvement related work. However, the drains cannot be installed at all locations because the steam structures may be located at a lower elevation than the sewer.

- Risk of No Action: Without structures with sufficient integrity at these areas, water can subcool the condensate in the main and create water hammer conditions.

- Non-financial Benefits (if applicable): The safety of customer and company personnel and property will be enhanced.

Status:
Ongoing

Funding ($000):

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</table>
Project Title: Remote Monitoring Phase II
Program Title: System Reinforcement
Station: Steam Distribution
Estimated Service Date: Ongoing

Work Description:

This program is designed to implement future upgrades and system enhancements to the Steam Remote Manhole Monitoring System (REMMS) infrastructure and associated equipment based upon findings and system/equipment performance during the original Remote Monitoring Program.

The following system enhancements are being considered:

- Enhance REMMS to include condensate level monitoring for inside steam mains (currently an R&D effort with Jet Propulsion Laboratories)
- Create an Engineering Module to perform the following features:
  - Create a separate “Alarm Page” for testing purposes; and allow Engineering to create “Background Alarms”
  - Analyze Pump Cycling data for duration and duty cycles; and enable/ disable Automatic Pump testing application
  - Collect trap temperature data to analyze overwhelming condensate conditions
  - Analyze 1-second inlet trap temperature data to determine trap functionality
  - Compare trap temperature data to Vendor’s trap profile to determine trap performance
  - Upgrade RMS software for User enhanced features (i.e. enhanced summary reports, disabling separate alarms, trap temperature analyses)
- Modify the Dispatcher’s Application to include the following enhancements:
  - Add displays for Hudson Avenue Remote Trap Monitoring and for Customer Trap Monitoring
  - Add “Relative Signal Strength” and “IP Address” to the Locations displays
  - Create a Pump Operation display showing status, operating cycles, and water levels
  - Create trap temperature alarms when trap inlet temperatures exceed “Area Trap Temperature Averages”
- Modify Steam RMS database to include the following enhancements:
  - Upon server reset, update all data point values to be “dumped” in reverse chronological order
  - Create separate Trap Temperature screen displays for Hudson Avenue Traps
- Modify the Dispatcher’s Application to include the following enhancements:
  - Add displays for Hudson Avenue Remote Trap Monitoring
  - Create an alarm timer function to be monitored for each new alarm point
  - Develop software interfaces to REMMS that will enable us to merge data from Logicover
  - Integrate data from trap monitoring inside customer facilities and add display for Customer Trap monitoring
  - Increase sensor flexibility to enable us to measure analog values such as steam pressures
  - Allow digital inputs to represent other processes (“pump activated”) and to control pump operation (“test pump”)
  - Ensure software flexibility with telecommunications software
- Ensure software flexibility with telecommunications software
Phase II program involves replacing current technology with improved products that can increase the reliability of the existing Remote Monitoring System. Increase reliability translates into reduced O&M costs which are significant with the present system. It also includes funding for incorporating the last portion of recommendation 12 from the PSC’s order after the incident at 41st St. and Lexington Avenue.

- **Alternatives**: Only implement the absolute mandatory repairs for the Steam REMMS system or those efforts mandated by the PSC.

- **Risk of No Action**: The relatively short life cycle of cellular technology will quickly make our present RTU communications hardware obsolete and will not allow us to continue expanding the number of steam locations to be monitored. Sprint/Nextel has given notice that the IDEN cellular network will be phased out in 2013. This will necessitate us to find alternative cellular providers and hardware. In addition, we are mandated by the PSC to explore the feasibility of monitoring condensate levels within the pipe at various locations.

- **Summary of Financial Benefits and Costs**: Real-time remote monitoring of trap and manhole conditions can potentially reduce costs that result from the labor intensive activities performed during a significant rain storm.

- **Non-financial Benefits (if applicable)**: Real-time remote monitoring of trap and manhole conditions significantly enhances the safety and reliability of the steam distribution system.

**Status**:

Scheduled to start in 2012 and continue on through 2017.

**Funding ($000)**: Various

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**Work Description:**

This program is to create a software and hardware system that can detect high risk conditions occurring on the Steam Distribution system which may cause a water hammer. Detection of these high risk conditions ahead of time will allow actions to be taken in order to prevent the water hammer from occurring. The system will take live remote monitoring data from the field and compare with the calculated data to determine if any of these conditions exist.

Condensate flow behavior in the steam system was studied and observed to flow with gravity or with steam when steam velocities are above certain critical values depending on the piping geometrical configurations. The various geometrical configurations present in the steam grid were tested and evaluated and corresponding critical steam velocities were measured and calculated. These values are important to the development of the model.

The system will build a model representative of the steam transmission and distribution piping network capable of analyzing two-phase flow of steam and condensate as steam is transported from the steam generating stations to the customers and condensate is formed through heat loss. The model will receive send-out information from the generating stations and consumption data from the customers and calculate the amount of condensate formed in the pipes and where it is flowing and the amount being discharged through the traps based on the steam velocities. It will calculate steam velocities, pressures, temperatures and superheat throughout the system which will also be used as back up values to the remote monitoring system when necessary.

**Justification:**

There is currently no existing system that can reliably detect these conditions that are precursor to a water hammer. This would help us to predict potentially serious incidents related to Water Hammer.

- **Alternatives:** The alternative of not having this predictor model is to provide constant monitoring and inspection of the steam system which may prevent a water hammer from happening in time.

- **Risk of No Action:** In the event of a high condensate situation, the system may be overwhelmed. If actions to remediate these conditions are not taken in time, the situation could contribute to a water hammer.

**Status:**

Ongoing

**Funding ($000):**

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**Project Title**: Demand Meter / Shuntflo Meter Conversion

**Project Number**: 22977-08

**Program Title**: Meter Installation

**Station**: Steam Distribution

**Estimated Service Date**: Various

### Work Description:

To replace the Shuntflo meter with the vortex-type meter at various locations. During the conversion process, the obsolete Shuntflo meter will be replaced by new state of the art technology Vortex meters, as well as installing KEP flow computers, and telephone modem for remote metering.

### Justification:

The vortex-type meter represents current technology with no moving parts. It has a larger flow capacity for a given pipe diameter, and it retains its measurement accuracy to below 10% of the meter's design maximum. This meter also, when paired with a flow computer, makes feasible the ability to store and remotely retrieve customer usage data. If this data is available, the monthly field visits to read meters can eventually be eliminated. The Shuntflo meter is made of cast iron material and prone to failure in case of a water hammer situation. The meter manufacturer has gone out of business for more than 15 years, and ordering parts is getting substantially more difficult and is through a third party. Vortex meter is made of cast steel preventing such occurrences.

- **Alternatives**: The alternative is to continue using the obsolete meter.

- **Risk of No Action**: The Shuntflo meter is made of cast iron material and is prone to failure in case of a water hammer situation. Vortex meter is made of cast steel preventing such occurrences. The Shuntflo meter also under-registers usage when below 20%.

- **Summary of Financial Benefits and Costs**: The Shuntflo meter under-registers steam consumption when the flow rate drops below 20% of the meter's design maximum capacity. The PSC-approved vortex meters used to replace them retain their measuring accuracy to below 10% of the meter design maximum.

- **Non-financial Benefits (if applicable)**: The vortex meters send out an electronic flow signal which is captured and logged by a flow computer/data logger. This capability enables demand billing, some remote troubleshooting, and retransmission of the flow signal to a customer's building management system for efficiency improvements. Also, the vortex meter has no moving parts and so is subject to less mechanical wear and tear.

- **Project Relationships (if applicable)**: Installations to run concurrent with those of the Meter Station Trap Remote Monitoring project.

### Status:

Ongoing

### Funding ($000):

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**Work Description:**

This program is designed to replace defective or failed Limitorque actuator operated angle globe meter regulating valves with new valve assemblies to provide remote control capability in the future. Funding is based on a 3 year historical average for expenditures in this category.

**Justification:**

A leaky valve can pass 200 lbs/hr of steam that would go undetected by the meter. This adds up to an annual steam loss of 1750 mbhs per valve or $35,040 at a rate of $20 per M lbs.

- **Alternatives:** The alternative is to continue using the defective valves.

- **Risk of No Action:** The Limitorques have been in service for approximately 25 years and are beginning to show signs of wear and tear which could lead to inoperable or leaky valves. The valves are installed at major steam customer locations (each bringing in over $1 million in sales each year); inoperative units run the risk of starving the customer of steam; and leaky units run the risk of revenue loss.

- **Summary of Financial Benefits and Costs:** A leaky valve can pass 200 lbs/hr of steam that would go undetected by the meter. This adds up to an annual steam loss of 1750 mbhs per valve.

- **Non-financial Benefits (if applicable):** The new valves will be enabled with remote monitoring and control capability when the new generation of flow computers is installed in the future. This will allow remote determination of valve positions and remote isolation of meter lines in the event of an emergency.

**Status:**

Ongoing

**Funding ($000):**

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Project Title                               M-Valve & Spence Valve Conversions
Project Number                            24820-12
Program Title                             Meter Installation
Station                                   Steam Distribution
Estimated Service Date                   Various

Work Description:

This program is designed to replace mechanical meter regulating valves with motor operated ball valves.

Justification:

The mechanical meter regulating valves allow a small amount of steam to leak through. This small amount goes unregistered by the meter. In addition, the mechanical meter regulating valves require more maintenance than the ball valves do.

- **Alternatives**: The alternative is to continue using the mechanical valves.
- **Risk of No Action**: Unmetered steam will be lost which reduces revenue and increases the variance.

- **Summary of Financial Benefits and Costs**: It is estimated that a leaky valve can pass 423 mbls/yr of steam that would go undetected by the meter. Also, the mechanical valve requires more maintenance than the ball valve.
- **Project Relationships (if applicable)**: A flow computer is required for control of the ball valve, thus the vortex metering system (meter conversion program) is a pre-requisite for this project.

Status:

Ongoing

Funding ($000):

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CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
STEAM DISTRIBUTION CONSTRUCTION PROGRAM,

EXHIBIT (SOP-3)

STEAM DISTRIBUTION CONSTRUCTION PROGRAM,

Estimated 2013 - 2017

Page 22 of 29

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Meter Room Asset Tagging</th>
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<tbody>
<tr>
<td>Project Number</td>
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<tr>
<td>Program Title</td>
<td>Meter Installation</td>
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<td>Steam Distribution</td>
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<tr>
<td>Estimated Service Date</td>
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Work Description:

Following the completion of the Steam Meter Room Piping Automation program, SDS will have access to electronic three dimensional maps of customer meter rooms with names associated with each asset. The SDS job tracking program that is being implemented in 2012 will also produce operating orders that refer to the new asset identifications for turn offs, turn ons, and for maintenance of meters and accessory equipment.

This project will add physical tags that match the new maps and job tracking system operating orders to customer meter rooms. This will help to reduce operating errors and ensure proper valve operation.

Justification:

This project is a continuation of the effort to reduce human error, which was started in 2010 for Steam Distribution assets located between the plants and the customer locations.

- **Alternatives**: Take no action and continue to operate as is.
- **Risk of No Action**: Continue risk of operator error when performing valving and inspection operations.
- **Non-Financial Benefits and Costs**: Efficiency improvement for verifying equipment when performing operations in customer locations as well as reduced risk of operator error.

Status:

Not Yet Started

Funding ($000):

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Project Title: Various Locations - Load Changes/Upgrades/Downsizing  
Project Number: 24366-11  
Program Title: Meter Installation  
Station: Steam Distribution  
Estimated Service Date: Various

Work Description:

This program is designed to upgrade or change the meter station for customers who are modifying their load, e.g., adding tenants, upgrading equipment, and performing major building renovations. This program addresses the Company furnished steam accessory equipment required for modifying the meter station resulting customer-initiated changes in their buildings. Funding is based on a 3 year historical average for expenditures in this category.

Justification:

This program represents equipment supplied for customer initiated changes. Sizing meters correctly will improve the overall system efficiency by providing more accurate meter readings and ensure that we provide steam at the mandated pressure.

- Alternatives: The alternative is to leave the current meters in place. However, this runs the risks of starving the customer of steam, or supplying the steam at a lower pressure which may violate the PSC requirement of 125 psig steam delivery.

- Risk of No Action: Not supplying the customer with enough steam to satisfy the load, or supplying steam at a lower than the required 125 psig pressure.

Status:

Ongoing

Funding ($000):

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<td>Program Title</td>
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**Work Description:**

To purchase vortex meters, flow computers and modems for the replacement of the Shuntflo meters. During the conversion, the obsolete cast iron Shuntflo meter will be replaced by state of the art steel Vortex meter and flow computer to provide flow measurement and load profile gathering. Telephone line and phone modem is to be installed for remote metering and data transmission to the office.

**Justification:**

The vortex-type meter represents current technology with no moving parts. It has a larger flow capacity for a given pipe diameter, and it retains its measurement accuracy to below 10% of the meter's design maximum. This meter also, when paired with a flow computer, makes feasible the ability to store and remotely retrieve customer usage data. If this data is available, the monthly field visits to read meters can eventually be eliminated. The manufacturer has gone out of business for more than 15 years and the replacement parts are ordered through a third party becoming more and more difficult to order at a higher cost. The Shuntflo meter is made of cast iron material; therefore, during a water hammer situation is prone to failure.

The Shuntflo meter is a mechanical turbine type meter and is subject to wear and tear. Its inherent design tends to under-register steam at flow rate below 20%.

- **Alternatives:** The alternative is not to replace the meter. The meter tends to under-register steam consumption resulting in revenue loss to the Company.

- **Risk of No Action:** The Shuntflo meter manufacturer has been out of business for over 10 years. There are only two vendors supplying replacement parts for this meter. If either of these two were to go out of business, it can be expected that the cost of parts from the other vendor will rise significantly. In addition, the Shuntflo meter is cast iron; therefore, during a water hammer situation is prone to failure.

- **Summary of Financial Benefits and Costs:** The Shuntflo meter under-registers steam consumption when the flow rate drops below 20% of the meter's design maximum capacity. The PSC-approved vortex meters used to replace them retain their measuring accuracy to below 10% of the meter design maximum.

- **Non-financial Benefits (if applicable):** The vortex meters send out an electronic flow signal which is captured and logged by a flow computer/data logger. This capability enables demand billing, some remote troubleshooting, and retransmission of the flow signal to a customer's building management system for efficiency improvements. Also, the vortex meter has no moving parts and is subject to less mechanical wear and tear.

- **Project Relationships (if applicable):** Installations to run concurrent with those of the Meter Station Trap Remote Monitoring project.
Status:
Ongoing

Funding ($000):

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Project Title: Meter Downsizing Program
Project Number: 24818-12
Program Title: Meter Purchases
Station: Steam Distribution
Estimated Service Date: Various

Work Description:
This program is designed to replace oversized steam meters at various customer locations due to operational changes and efficiency improvements by customers. Note that this program addresses Company-initiated meter station changes. Funding is based on 3 year historical averages for expenditures in this category.

Justification:
Downsizing the meters enables more accurate capturing of the lower customer loads resulting from operational changes and efficiency improvements.

- Alternatives: The alternative is to continue using the oversized meters.
- Risk of No Action: The oversized meters will register lower steam flows at low flow rates thereby causing lost revenue.
- Summary of Financial Benefits and Costs: Downsizing the meters enables more accurate capturing of the lower customer loads resulting from operational changes and efficiency improvements.

Status:
Ongoing

Funding ($000):

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## Work Description:

This program comprises the purchase of steam meters for new customers and existing customers performing building renovations that will result in changes in load. Funding allocation is based on current forecasted request for services and 3-year historical average.

## Justification:

The material is required to provide proper metering of steam for new customers or customers adding load.

- **Alternatives:** There are no alternatives to this program. Steam consumption cannot be determined without metering equipment.

- **Risk of No Action:** Lack of service to a new customer.

## Status:

Ongoing

## Funding ($000):

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Project Title | Customer Profiling Software - IT (New Business)  
---|---
Project Number | 6SD1311  
Program Title | Interference  
Station | Steam Distribution  
Estimated Service Date | Various

<table>
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<tr>
<th>Work Description:</th>
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• Design and implement the expansion of the Contacts application to interface with data from Steam Application, SOMIS, Right Now Technologies and Customer Care and Billing.  
• Investigate, design and implement an effective method of interfacing with and creating views of the Customer Care and Billing system.  
• Enhance and expand development of the Sample Bill Demand Comparison application.  

<table>
<thead>
<tr>
<th>Justification:</th>
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• The Demand Metering Data Management system lacks a common venue or centralized repository where vital customer contact information can be stored and accessed from a common intranet address. This would include customer appointed emergency contact personnel, email and fax information, building and steam main shutoff contacts, day-to-day building operations and management personnel, billing and payment contacts. Currently, contact information is stored throughout various applications which lack a common point at which information can be accessed, updated and deleted. Such information is often housed in client server applications which greatly restrict access from those outside the individual operating areas.  
• During the November 2006 – April 2007 cycle billing period, perspective demand billing class customers were provided with an emailed electronic sample bill comparison between their current service classification and the demand billing service classification. Sample bills of this nature were made available to different strata of our customers and many found the graphed interval data very useful and requested for us to retain this service on a permanent basis.  
• Proper interfacing and access to various customer, address, usage, billing and service agreement data fields was not established at the time of conversion (April 2008) from the Steam Customer Service System to the Customer and Care Billing system. Reports and information of this nature is critical to our day-to-day dealings with our customers and greatly affects the timely review and analysis of usage and billing inquiries. Currently, reporting of this nature is only available through custom designed queries that need specialized knowledge and access to the application server. This is not a desirable attribute since it interferes with server efficiencies.  

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<th>Alternatives:</th>
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The alternative would be to eliminate the Contacts Project. The purpose of this project is to provide our Business Development personnel with the most efficient manner in which to create and develop relationships with the decision makers and have the ability to prioritize, based upon the properties that would best serve Con Edison on the steam system, as opposed other forms of energy supply. Curtailing the expansion of an effective manner of processing and interfacing with the new billing system (CCB) would leave us with the inability to bill prospective demand billing customers.

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We will be in violation of PSC directives to assess and assign various strata of steam customers to newly derived service classification studies.

- We would lose the ability to assess what is the best method for determining which steam customers would be best serviced by proprietary agreements (SC5 contracts).
- We would be handicapped in dealing with the personnel that are making decisions that are detrimental to our business plan and corporate decisions.

Summary of Non-Financial Benefits:

- To maintain the ability to provide our customers with the data necessary to assess the most advantageous method for operating their buildings within the current steam service classifications.
- Continue to maintain the level of relationships that build trust between Con Edison and our steam customers.

**Status:**

Ongoing

**Funding ($000):**

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