



Martin F. Heslin
Assistant General Counsel
Consolidated Edison Company of New York, Inc.
4 Irving Place, Room 1815-S, New York NY 10003
212-460-4705 Fax: 212-677-5850
Email: Heslinm@coned.com

November 1, 2010

By Electronic Filing

Hon. Jaclyn A. Brillling
Secretary
New York State
Department of Public Service
Three Empire State Plaza
Albany, New York 12223

Re: Case 99-E-0930 – Proceeding on Motion of the Commission to Investigate the July 6, 1999 Power Outage of Con Edison's Washington Heights Network

Dear Secretary Brillling:

Enclosed for electronic filing are an original and five copies of the *November 1, 2010 Status Report on Recommendation Implementation Plans of Consolidated Edison Company of New York, Inc.* This report provides the status of Con Edison's actions to implement the recommendations made in the "Report on Consolidated Edison's July 1999 System Outages" issued on March 15, 2000 in this proceeding.

A copy of this filing is being sent to the City of New York, the Attorney General of the State of New York, and the New York State Consumer Protection Board.

Very truly yours,

cc: (by USPS Mail)
Attorney General of the State of New York
City of New York (New York City Economic Development Corporation)
New York State Consumer Protection Board

**STATE OF NEW YORK
PUBLIC SERVICE COMMISSION**

----- X
Proceeding on Motion of the Commission :
to Investigate the July 6, 1999 Power Outage : Case 99-E-0930
of Con Edison's Washington Heights Network :
----- X

**NOVEMBER 1, 2010 STATUS REPORT ON
RECOMMENDATION IMPLEMENTATION PLANS OF
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.**

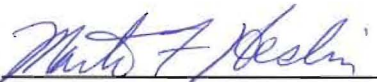
In response to the Public Service Commission's May 26, 2000 and September 20, 2002 orders in this proceeding, Con Edison is filing with the Public Service Commission its November 1, 2010 status report on its plans to implement the recommendations made in the *Report on Consolidated Edison's July 1999 System Outages* issued March 15, 2000 in this proceeding.

As noted in the Commission's September 20, 2002 order, and as discussed in prior status reports filed by Con Edison, implementation of many of the recommendations is complete. Accordingly, as in the prior status reports, the attached report addresses those recommendations where implementation is ongoing.

Dated: November 1, 2010

Respectfully submitted,

CONSOLIDATED EDISON COMPANY
OF NEW YORK, INC.

By 
Martin F. Heslin
Assistant General Counsel

4 Irving Place
New York, NY 10003
(212) 460-4705

II-1 Con Edison should improve its cable rating methods to more accurately reflect actual thermal conditions and develop techniques to better model its network systems, especially those under multiple contingency conditions.

Summary of Completed Actions:

1. Cable Rating Methods:

Con Edison has developed a new primary cable rating thermal rating model. Network feeder cables in a duct bank occupied by different cables with different loadings and loss factors can now be modeled in the environment that they operate in. Factors such as actual duct-bank occupancy, variable soil resistivity, ambient temperatures, external heat sources, such as steam mains, and the thermal effect of secondary cables can now be incorporated into network cable ratings. The program incorporates load flow data to perform both steady state (normal) and transient (emergency) cable ratings. The model provides more accurate data on a cable sections ability to carry load and thus the need to reinforce the cable.

Con Edison has re-rated the normal and emergency conductor temperature limits of older paper insulated lead covered cable ("PILC"). The Company lowered the thermal rating of this cable to be more consistent with manufacturer ratings.

2. Network System Modeling

Con Edison has developed as Advanced Contingency Analysis (ACA) program for use in regional electric control centers. . ACA improved the existing WOLF (World Class Online Load Flow application) contingency analysis program by providing the company with the ability to better analyze feeder outages above second contingency design criteria. The original WOLF contingency analysis program relied upon a static load flow model created from the previous summer peak loads. The ACA program provides a near real-time dynamic demand model based on current loading at the transformers that provides analytical results during multiple contingency events. For example, if a third feeder opens automatically in a network, a new load flow model will be created based on real-time, corrected, monitored values at the transformers in the network, and the analysis tools then perform load flow analyses for the next worst-case scenarios. To support the ACA program, the company developed the Remote Monitoring Estimator (RME) to provide estimates for Remote Monitoring System transformer-load readings that are either missing or are determined to be incorrect. Whenever correct transformer load values are not available, RME-generated values are automatically supplied to the WOLF analysis engine for contingency analysis.

Con Edison has developed AutoWOLF Visualization program that provides the Control Center Operators and engineers with a display of our Auto WOLF analysis reports. The application uses the mapping information to display the current conditions as well as the

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

next worst conditions based on existing contingencies. It is used principally in response to network feeder contingencies.

Con Edison developed the Distribution Primary Visualization System (DPVS) which creates a visualization environment for operators that displays the status and near real-time load of primary network components. DPVS information includes feeder configurations, network protector status, feeder outage status, and transformer load status. In addition, this visualization system provides a link to the Vault Central site, which offers the following information in support of vault monitoring, analysis and problem resolution:

- Current information - real-time RMS, RME calculations, Banks Off, Open Mains, peak loads
- Static information - nearby transformers, feeders, M&S plates, vault locations, sizes, ratings, models, install dates
- Inspection information - last vault inspection and stray voltage inspection, with links to historical inspections
- Switch checks - last switch check and links to historical switch checks.
- The Distribution Primary Visualization System is available for all regions.

Con Edison has completed development of the new application and database that allows detailed conduit and manhole information, previously available on paper drawings and maps to be converted into digital format and maintained and displayed in an electronic database. The application and database have been deployed in each of the Company's four Regions. Con Edison developed a five-year plan to convert New York City conduit maps to digital format to facilitate their maintenance, storage and retrieval

Con Edison has developed a computer model that models thermal characteristics of underground distribution structures. The manhole model has enhanced the company's understanding of the thermal environment in which feeder cables operate and provided a tool that can be used to model other underground distribution structures.

Service Demand Estimation Project

Con Edison has completed the development of the Service Demand Estimation (SDE) program as a tool to determine the location of customer load on the secondary system. This information assists in determining the load flow and voltage within the secondary grid in studies that are used for design and analysis of the secondary system. The SDE program distributes secondary demands to the service points of supply to customers for the company's network modeling programs. The project consists of three programs. The CuFLink application links the monthly billing information to the customer service points. The Service Demand Estimation application utilizes the CuFLink data extraction of monthly billing information for each customer and converts it to peak summer demand to be placed at each service point of supply. The Reconciliation application reconciles the actual Remote Monitoring System (RMS) load information recorded at each network transformer with the SDE output so that the calculated load flow at each network transformer approximates the real time measured points at the secondary bus of each network transformer reported by

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

RMS. The SDE program has been integrated into the company's Poly Voltage Load Flow program is available to the Regions for their use. The purpose of this application is for engineering and design planning analysis of the secondary grid to prioritize the replacement and reinforcement of secondary mains and to optimize the designs of the network grids.

With the completion of the Cuflink, Service Demand Estimator, and Reconciliation software programs, the next phase of this project is the use of the Cuflink software to link and locate load information (monthly kilowatt hours and monthly peak demand) from the Customer Information System (CIS) onto secondary system service points maintained in the Vision Mapping (VM) database. The Company is working to identify and map load information to service points for six networks in three regional customer service areas.

After load information is linked to the service points throughout a network, the Service Demand Estimator (SED) software will convert the service-point monthly kilowatt hours or peak demand data into peak summer coincident demands during a single time period. Following this, the Reconciliation software will reconcile the actual Remote Monitoring System (RMS) load information recorded at each network transformer with the SDE output so that the calculated load flow at each network transformer approximates the real time measured points at the secondary bus of each network transformer reported by RMS. At that point, the Company will be able to run Poly Voltage Load calculations to determine load flows on the secondary mains in order to identify mains that are open and mains that require reinforcement.

Secondary Model Load Flow Validation

As part of Con Edison's Smart Grid program, the Company is installing smart technologies in a select area in Northwest Queens in the Long Island City network to evaluate the benefits of Smart Grid in New York City's electric system. This Research and Development pilot will evaluate several innovative technologies including smart meters, outage management functions, and the integration of distributed energy resources.

Approximately 1,500 smart meters are being located in diverse commercial and residential locations: high rises, basements, and single family homes. The data obtained with the use of smart meters will be used to develop integrated customer load profiles for secondary model load flow validation. Model validation supports the use of Poly Voltage Load Flow (PVL) and World-class Operations Load Flow (WOLF) programs on secondary network model. The smart meters provide additional known data points to assist in refining the distributed demand load estimations utilized in our network simulations created in the PVL program. The known data points will account for unknown diversity in our grid and provide additional meter points for the reconciliation algorithm used to adjust the estimated demands for the peak summer day. The modeling results will help to identify abnormal mains, particularly open conductors, making it possible to take actions to prevent overloading of the remaining conductors.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

Status Report (November 1, 2010)

Items 1, 2, 3, 4, 5, 7, 8, 9, 10 and 11

Completed per prior status reports.

Item 6

Service Demand Estimation Project

The Company has created models for an additional 6 networks since the previous update bringing the total to 58 models as follows

Ridgewood	Pennsylvania
Flushing	Lenox Hill
Flatbush	Central Bronx
Williamsburg	Lincoln Square
Crown Heights	Cooper Square
Borough Hall	Herald Square
Sheepshead Bay	Grand Central
Maspeth	Madison Square
Long Island City	Kips Bay
Riverdale	Prospect Park
Brighton Beach	City Hall
Rego Park	Hunter
Bay Ridge	Chelsea
Park Slope	Harlem
Ocean Parkway	Beekman
Jamaica	Bowling Green
Yorkville	Canal
Northeast Bronx	Hudson
Sheridan Square	Fulton
Southeast Bronx	Park Place
West Bronx	Greeley Square
Jackson Heights	Cortlandt
Fordham	Fashion
Central Park	Empire
Turtle Bay	Battery Park City
Rockefeller Center	Triboro
Sutton	

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

Plaza
Columbus Circle
Times Square
Greenwich
Washington Heights

The Company continues to use the new distributed demand models to create 2010 planning models for primary load relief.

Secondary Model Load Flow Validation

We are currently receiving information from 1100 meters and are developing a process to input the data into our Poly Voltage Load flow models to proceed with the validation study. The smart meter information will provide additional known data points to assist in refining the distributed demand load estimations. In order to proceed with model validation, we will need to collect data from a full summer. Below is the current schedule to complete model validation.

Task	2010				2011				2012		
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q
Install all meters for Model Validation	█										
Develop Method to integrate meter data in PVL		█			█						
Collect and Monitor data to validate model			█		█						
Validate Model									█		
Publish Results											█

In order to validate the secondary model load flow results, the Company continues to develop a correlation between the secondary load flows and existing secondary grid conditions such as open mains. The Bronx/Westchester region is field verifying selected secondary main overloads above 150% of emergency in 6 networks in order to determine the factors contributing to the secondary overloads and validate regional secondary.

- II-2 Con Edison should evaluate reasonable actions that can be taken to improve monitoring of its secondary system, including use of additional monitoring devices where feasible, and report to the Commission by June 1, 2000 on its findings.**

Summary of Completed Actions

Con Edison undertook a project in 2000 to develop the next generation for system monitoring, called the Secondary Underground Network Distribution Automation System ("SUNDAS"), that would replace the Remote Monitoring System ("RMS") for monitoring network transformers and provide secondary system monitoring capability. In 1999, Con Edison's RMS provided the following network protector ("NWP") and transformer information: current of each phase, NWP status (open/closed), water levels in manholes, fuse status, open phases, and in a few cases, top oil temperature. In the SUNDAS R&D project, network protector microprocessor relays would provide this information as well as voltage, phase angle, relay status and diagnosis, and the capability for system operators to remotely change relay settings and operate the NWP. The SUNDAS R&D project was also designed to monitor the low voltage secondary system by the installation of sensors at intersections and mid-block locations to obtain three-phase voltage, current, and phase-angle data.

The Company achieved initial success and actually installed a working SUNDAS in the Hunter network. The SUNDAS technology entailed use of a high frequency PLC signal injected on the secondary network grid and used as a local area network ("LAN") two-way communications medium to communicate data from the network protector relays and the secondary sensors. However, the carriers providing the communications network, initially AT&T and then Verizon, discontinued providing the cellular digital packet data service necessary to operate the system. This rendered obsolete the modem hardware in the communications concentrators and made the data collection software inoperable. After investigating alternative communications systems, the Company concluded that a similar communications setback could occur again after the system was deployed and force resort to another costly alternative. The additional costs and effort related to the hardware and software redesign plus the anticipated very high deployment costs of the system, prompted the Company to abandon this project in 2004 and to focus on the enhancement of its existing RMS that uses the Company power cables to communicate transformer data to engineering personnel and regional control centers.

Beginning in 2004, Con Edison took advantage of then expiring original patents to promote RMS technology advances so it could replace outdated RMS equipment. The overall plan has been to improve the RMS technology and performance through the installation of higher-power transmitters and improved-sensitivity receivers that will provide enhanced data capability and functionality.

The new receivers offer increased sensitivity, improved data error correction, and remote diagnostic tools including pick-up coil testing to alert operators when critical components of

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

the RMS system have failed. They are also designed with the ability the process more information from the field affording the opportunity to include additional status inputs from the RMS transmitters. The new transmitters offer a higher output capability, and are outfitted to offer three additional analog and digital sensory inputs for temperature and pressure transducers along with 3 phases of voltage and additional status inputs.

As of June 6, 2007, all 62 RMS receivers on the system have been upgraded by installing new second generation receivers. Following the installation of the new receivers, there has been an improvement in RMS reporting rates.

As of October 2010, we have installed approximately 17,982 third generation Remote Monitoring System (RMS) transmitters. As of October 13, 2010, we have installed Remote Monitoring System Pressure, Temperature, and Oil Level (RMSPTO) sensors on 8,709 transformers. We continue to install RMSPTO sensors in the Astoria Transformer Shop on new transformers due for field replacements and system reinforcement. We also continue to install units during routine transformer inspections.

In 2006, the Company, working with a consultant, conducted a study of secondary monitoring techniques for monitoring the secondary system under normal and multiple contingency event conditions. The study evaluated and benchmarked secondary monitoring technologies across the utility industry under three separate categories: sensor devices, communication devices, and data processor devices. In addition, the Company evaluated optimized sensor placement and examined secondary model validation techniques. The study determined that secondary monitoring presents a variety of challenges including the following:

- Secondary Monitoring across all utilities is limited to the network protector at the transformer. Currently no utility monitors the secondary system between the network protector and the service termination at the customer end.
- Due to limited commercial interest in underground secondary monitoring technologies, few vendors offer complete packages and further modifications/enhancements are required to devices currently available in the market before they can be reliably deployed in the underground networks.
- Development of the underground secondary monitoring technology has been limited by reliable communication techniques due to the harsh underground environment, solid structure covers, and physical constraints arising from limited underground space for device placement.
- The development of the secondary monitoring solution will vary by network composition factors such as load distribution, commercial vs. residential, distribution system type, underground vs. overhead, and load flow modeling techniques.
- The cost-to-benefit analysis cannot be performed or justified until the technologies are deployed and the accelerated life testing of the components is performed.

A secondary monitoring system consists of sensors, communication methodology and data processing. Deployment of such a system must be technically feasible, financially practical, and focused on specific deployment objectives. Deployment objectives include identifying

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

best potential sensor locations and best potential monitoring technologies to: a) validate the network secondary distributed model for use by the Poly Voltage Load Flow (PVL) and World-class Operations Load Flow (WOLF) programs; and b) identify abnormal mains and blown limiters. The Company identified the basic requirements for various secondary monitoring components and developed a prototype of the secondary monitoring device that meets the basic secondary monitoring functionalities.

In order to validate the accuracy of the various uRTU device components and establish the technical feasibility of the prototype, the Company conducted extensive testing of the following parameters: elevated temperature test, effect of magnetic field induction on current transformer (CT), effect of variation of installation angle on CT's performance, transportation drop test, accelerated life test, and surge test.

The Company initiated a pilot deployment of the prototype secondary monitoring device in 15 locations in the Sutton Network. Based on the results of the prototype and pilot installations, additional locations will be selected, and the program will be expanded to develop a technical solution for the entire Sutton Network. Prior to the expansion of the initial deployment, the reliability of the communication with these devices has to be established. Once a technical solution is developed, state estimation techniques along with real time data will be used to improve the accuracy of the secondary models. A combination of secondary modeling results and real time secondary monitoring data will be used to assess the health of the secondary grid and predict abnormalities such as open mains and blown limiters.

In June 2008, the Company installed 92 secondary monitoring units (uRTU devices) in the Sutton Network. 32 units were installed in Bus Compartments, and 60 units were installed in manholes. The goal of the pilot project was to utilize the load flow data from these locations to validate the peak distributed demand generated by the network secondary models for summer 2008.

None of the units installed inside manhole locations provided accurate data. Major reasons for inaccurate data quality include congestion in manholes and inability to identify the secondary main section in the manholes. Typically in the underground structures the cable is racked tightly against the wall. Consequently, it makes it very difficult to place the current transformers (CTs) perpendicular to the sections of cable they are intended to measure and to install them in such a way that would prevent them from touching any sections of cable. As a result of this limitation, the data quality from uRTU devices installed inside manholes is limited. The identification of secondary mains posed a significant challenge to successfully implement a comprehensive secondary monitoring solution. The correlation of the monitoring data from the uRTU devices against the load flows from the distributed secondary models requires reliable identification of the ends of secondary main section running from structure to structure so that a monitoring unit can be placed at each end of a particular section of cable. However, identification of the ends of a given secondary cable in each structure proved to be virtually impossible without destructive testing of the cable. As result, in most cases the units were not installed at each end of a given section as was originally intended. In the absence of reliable identification of the secondary main sections, it

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

is impossible to correlate the monitoring data from the uRTU devices against the load flows from the distributed secondary models.

The Company has been able to use data from only 13 locations that were installed at bus compartments. The bus compartment design posed a major challenge for reliable communication and accurate data reporting. Because the fixed distance between the bus bars prevented perpendicular installation of CT's, data accuracy was compromised. Only 13 of the 32 bus compartment locations are reporting accurately.

Intermittent wireless coverage also prevented continuous data reporting from many units.

The secondary monitoring technology has proven to be cost prohibitive. The final cost of the entire secondary monitoring solution for the pilot project, including the uRTU device, the CT's, and the cost of installation, was at \$8,000/unit including overheads.

The Company has concluded that monitoring secondary mains is not feasible for the reasons discussed above.

Status Report (November 1, 2010)

Update on Secondary Monitoring

As discussed above in the "Summary of Completed Actions," Con Edison has concluded that monitoring secondary mains is not feasible.

The Company's Secondary Demand Estimation Project and Secondary Model Load Flow Validation Project, see ongoing reports for Recommendation II-1, Item 6, will continue to focus on the secondary network modeling results to help to identify abnormal mains, particularly open conductors, making it possible to take actions to prevent overloading of the remaining conductors.

This recommendation is completed.

II-7 Con Edison should develop a program for eliminating stop joints with high failure rates that are still in service.

Summary of Prior Actions

Stop joints are used to connect one section of a feeder to another section. Stop joints have to be used when a section of paper-insulated lead-covered (PILC) cable is connected to a section of ethylene propylene rubber (EPR) cable or cross-linked polyethylene (XLP) cable so as to prevent the oil in the PILC cable from migrating to the other cable section.

Two types of stop joints were experiencing a high failure rate – Elastimold 2W/1W stop joints, and pre-1994 Raychem 3W/1W stop joints. Con Edison stopped installing Elastimold 2W/1W joints in 2000 and pre-1994 Raychem 3W/1W joints in 1994.

As the population of pre-1994 Raychem 3W/1W stop joints has been reduced through removals from 2000 to date, the failure rate of this type of joint has declined to an acceptable level comparable to the failure rate of the second-generation Raychem 3W/1W stop joints that replaced them in 1994. The failure rate of the pre-94 Raychem 3W/1W stop joints declined substantially because the problem was not the design itself but rather the assembly of the joint in the field, i.e., workmanship. The second generation (post 1993) Raychem 3W/1W included design changes that facilitate assembly of the joint in order to make workmanship errors less likely. (The process for heat shrinking the inner and outer insulating sleeves was made easier.) The failure rate of the pre-94 Raychem 3W/1W declined to acceptable levels because many of these joints with workmanship errors have failed and been removed, and the remaining population largely reflects the performance of the joints that were correctly constructed. As a result, the failure rate of pre-94 Raychem 3W/1W stop joints is now similar to the second-generation Raychem 3W/1W stop joints that replaced them. Thus, the Company no longer targets pre-1994 Raychem 3W/1W joints for removal but continues to remove these joints through normal work, i.e., high-potential testing, feeder and joint failures, feeder reinforcement, new business, interference work, and PILC cable removal. Con Edison estimates that there were 5,444 pre-94 Raychem 3W/1W joints in 2000.

Unlike the Raychem joints, the failure rate of Elastimold 2W/1W stop joints has remained high relative to other stop-joints on the system. The Company specifically targets Elastimold 2W/1W stop joints for removal so that by December 31, 2008, the failure rate will be improved to an acceptable level or these stop joints will have been eliminated from the primary network system entirely. Con Edison estimates that there were 2,458 Elastimold 2W/1W stop joints on the system in 2000.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

Status Report (May 1, 2010)

As described in prior reports, the Company uses a computer-assisted algorithm logic program in conjunction with the Company's mapping records (Vision cable database) to estimate the number and location of stop joints. The Company estimates that as of April 26, 2010 there are about 1,847 pre-1994 Raychem 3W-1W stop-joints on the underground distribution system. This is a reduction of 144 pre-1994 stop-joints from the estimated October 25, 2009 population (see table 1 for summer failure rates).

The Company estimated, and reported in the May 2009 update, that all Elastimold 2W-1W stop-joints had been removed from the underground distribution system. Despite the removal of Elastimold 2W-1W stop-joints from all their estimated locations, unanticipated Elastimold stop-joint failures in Westchester promoted an additional search for these splices throughout the underground network system. The computerized method to search for these splices was modified to be less restrictive in determining possible locations. The modified program produced an initial listing of approximately 400 structures that may contain an Elastimold 2W-1W splice. From these initial structures 108 were determined to have a real possibility of containing an Elastimold 2W-1W stop-joint. A physical inspection of these 108 structures yielded an additional nine Elastimold stop-joints. To date, all nine splices have been replaced. In addition, work crews have been instructed to inspect every structure they enter for Elastimold 2W-1W stop-joints. Any additional Elastimold 2W-1W stop-joints splices found through subsequent inspections will be logged in an inspection database and removed during an appropriate feeder outage.

Table 1

Failure Rate Trends - Raychem 3W-1W Stop-Joints Summer OAs/100 splices				
Year	3W-1W Pre 1994		3W-1W Post 1993	
	13 kV	27 kV	13kV	27 kV
1999	1.198	0.725	*****	*****
2000	0.617	0.611	*****	****
2001	0.460	0.542	0.345	0.227
2002	0.275	0.336	0.343	0.349
2003	0.483	0.440	0.488	0.305
2004	0.646	0.362	0.386	0.247
2005	0.727	0.603	1.035	0.863
2006	0.694	0.602	0.711	0.611
2007	0.382	0.198	0.660	0.603
2008	0.308	0.221	0.775	0.736
2009	0.539	0.433	0.403	0.425

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

Raychem 3W-1W transition splices (stop-joints) Pre-1994:

- Population as of 10/25/2009 = 1,991
- Population as of 04/26/2010 = 1,847
- Difference since 10/25/2009 = -144

Status Report (November 1, 2010)

As described in prior reports, the Company uses a computer-assisted algorithm logic program in conjunction with the Company's mapping records (Vision cable database) to estimate the number and location of stop joints. The Company estimates that as of October 13, 2010 there are about 1,770 pre-1994 Raychem 3W-1W stop-joints on the underground distribution system. This is a reduction of 77 pre-1994 stop-joints from the estimated April 26, 2009 population (see Table 1 for summer failure rates).

The Company estimated, and reported in the May 2009 update, that all Elastimold 2W-1W stop-joints had been removed from the underground distribution system. Despite the removal of Elastimold 2W-1W stop-joints from all their estimated locations, unanticipated Elastimold stop-joint failures in Westchester promoted an additional search for these splices throughout the underground network system. The computerized method to search for these splices was modified to be less restrictive in determining possible locations. The modified program produced an initial listing of approximately 400 structures that may contain an Elastimold 2W-1W splice. From these initial structures 108 were determined to have a real possibility of containing an Elastimold 2W-1W stop-joint. A physical inspection of these 108 structures yielded an additional nine Elastimold stop-joints. To date, all nine splices have been replaced. In addition, work crews have been instructed to inspect every structure they enter for Elastimold 2W-1W stop-joints. Since the May, 2010 status report, no additional Elastimold 2W-1W stop-joints have been located and removed through inspections; however, eight splices were removed during summer 2010 due to emergency work (the splices failure in service). Any additional Elastimold 2W-1W stop-joints splices found through subsequent inspections will continue to be logged in an inspection database and removed during an appropriate feeder outage.

**Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010**

Table 1

Failure Rate Trends - Raychem 3W-1W Stop-Joints Summer OAs/100 Splices				
Year	3W-1W Pre 1994		3W-1W Post 1993	
	13kV	27kV	13kV	27kV
1999	1.198	0.725	****	****
2000	0.617	0.611	****	****
2001	0.46	0.542	0.354	0.227
2002	0.275	0.336	3.343	0.349
2003	0.483	0.44	0.488	0.305
2004	0.646	0.362	0.386	0.247
2005	0.727	0.603	1.035	0.863
2006	0.694	0.602	0.711	0.611
2007	0.382	0.198	0.66	0.603
2008	0.308	0.221	0.775	0.736
2009	0.539	0.433	0.403	0.425
2010	0.826	0.716	0.772	0.941

Raychem 3W-1W transition splices (stop-joints) Pre-1994:

- Population as of 04/26/2010 = 1,847
- Population as of 10/13/2010 = 1,770
- Difference since 10/25/2009 = -77

II-9 Con Edison should implement its cable rejuvenation program associated with manholes and reassess its manhole inspection program.

Summary of Prior Actions

1. Manhole Ventilation Project

After the DPS Staff issued this recommendation, they told the company that their intent was for the company to improve the condition of equipment in manholes and mitigate manhole events (fires and explosions). "Cable rejuvenation" referred to a "self-healing" cable R&D project that the company was investigating at the time but found was not feasible. Staff concurred that the cable rejuvenation program need not proceed and asked the company to propose an alternative program. Con Edison conducted a large-scale evaluation of the impact of ventilating manholes and service boxes for mitigation of manhole events. The company designed a new manhole cover to provide both ventilation and protection from the inflow of debris, rock salt, and other liquids. The project demonstrated the potential for vented covers to mitigate manhole explosions. In 2005, Con Edison began installing vented manhole covers system-wide and expects to complete installation by the end of 2011.

2. Manhole Inspection Tracking

Specification EO-1184, "Periodic Inspection, Maintenance and Reporting of Distribution Underground Cables and Joints," was revised to require that, a structure (manhole, service box, or vault) inspection be performed as part of routine work by any qualified field crew prior to closing-up a subsurface structure, that minor repairs be performed during these visits, and that the results of the inspection and repairs be recorded in accordance with the procedures employed for regular inspections.

Con Edison also purchased portable computer equipment (133 units and associated accessories) to support the more effective entry of manhole inspection information into Con Edison's CIMOES data system. This portable computer equipment has allowed crews to accurately and expeditiously enter inspection and repair information while they are on location in the field. This information is downloaded directly into the main CIMOES database, which is used to track completed work and to plan future projects.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

Status Report (May 1, 2010)

Update on Manhole Ventilation Program

The Table below summarizes the replacement totals to date. As of March 31, 2010, the Company has replaced 56,491 manhole. The Company plans to replace the remaining 3509 covers by the end of 2011.

Region	Replaced as of March 31, 2010
Manhattan	14,691
Brooklyn	15,839
Queens	13,927
Westchester	3,255
Bronx	7,780
Staten Island	999
Total	56,491

Status Report (November 1, 2010)

Update on Manhole Ventilation Program

The Table below summarizes the replacement totals to September 30, 2010.

Region	Replaced as of September 30, 2010
Manhattan	14,718
Brooklyn	17,385
Queens	14,016
Westchester	3,399
Bronx	7,843
Staten Island	998
Total	58,359

II-10 Con Edison should accelerate its evaluation of alternatives to high-potential testing, such as low frequency AC testing, to determine their possible effectiveness and report to the Commission on its efforts by June 1.

Summary of Prior Actions

Staff stated that the Company's DC high-potential test program should continue but recommended that the Company explore new testing methods with less potential to damage cables being tested. The Company pursued the following three investigations for an alternative to high potential testing of feeders. :

1. Partial Discharge Testing

The Partial Discharge testing program investigation closed after it was determined that this method of detecting incipient faults is not a reliable indicator of potential feeder failure.

2. Thermal Testing

Simulation studies and analysis during the course of an R&D projects lasting over two years revealed flaws in the application of a thermal testing device to the network system. Studies showed that many existing network protectors would be cycled during the planned thermal testing in non-summer periods creating unacceptable local network contingencies and loads. Also, the ability of the test device to replicate summer ambient temperatures towards the farthest end of the feeder, as needed for effective testing, remained as an unresolved technical concern. Thermal calculations indicated that the device would not be able to thermally load the entire feeder. In addition, the test device was too big and too heavy, and would require a motorized pallet.

3. Very Low Frequency Testing

In 2000, Con Edison's initiated a pilot program to investigate the effectiveness of 0.1 Hz very low frequency (VLF) AC hi-pot testing on the performance of the primary distribution system. VLF high potential testing equipment was purchased, and a program was developed to test the primary feeders on both the 13 kV and 27 kV distribution systems. Test program results based on seven years of testing support the following findings:

- The 0.1 Hz AC hi-pot test has demonstrated the ability to flush out defects on solid dielectric primary distribution cables and joints.
- For the 13 kV system, the 0.1 Hz. AC hi-pot test out-performed the traditional DC hi-pot test. Results from over seven years of VLF testing show that after a successful VLF hi-pot test on a 13 kV feeder the average time until the next failure is over 1 year. This compares favorably to the average time to the next failure following a DC hi-pot which is six months.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

- On the basis of its study, Con Edison has concluded that 0.1 Hz AC VLF hi-pot testing is an acceptable alternative to the DC hi-pot test for extruded solid-dielectric cable operating on the 13kV system.
- Although the results from the 27kV system are promising, due to the limited amount of available test data it is not yet possible to determine the effectiveness of VLF testing on 27 kV feeders. The Company is continuing the 0.1 Hz. AC hi-pot test validation program on 27 kV feeders. Based on the sampling criteria, an additional thirty 27 kV feeders will be included in the test program. Con Edison continues to work through the challenging logistics (primarily scheduling outages) of performing VLF hi-pot tests on the 27 kV to obtain additional test data.

Con Edison has revised its specification EO-4019, "Testing of AC Feeders Operating at 4 kV to 33 kV," to summarize the requirements for the use of VLF 0.1 Hz AC hi-pot tests where appropriate. The Company plans to continue the program using its current fleet of three AC test trucks and is ordering additional trucks and has also approved the Purchase and Test specification ES-4018 to purchase VLF 0.1 Hz AC hi-pot test sets for substation applications.

Status Report (May 1, 2010)

Very Low Frequency Testing

The Company has received delivery of 17 stationary Very Low Frequency (VLF) test sets for installation at various 27 kV and 13 kV substations. The operational status of the 17 VLF test sets is listed in table one, below. The substation selection for new test set installations is based on the amount of solid dielectric cable installed as well the available space in the existing substations.

In addition to the three mobile test sets currently in use, we have completed a revised design for the installation three additional VLF test sets in trucks. The test sets and the vehicles have been delivered and will be assembled and placed in service by the end of May 2010.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

Table 1: AC VLF Test Set Inventory		
Set	Substation	Status
1	North Queens	Installed & Available
2	Corona	Installed & Available
3	Parkview	Installed & Available
4	Rockview	Installed & Available
5	Seaport	Installed & Available
6	Brownsville	Installed & Available
7	Trade Center	Installed & Available
8	Jamaica	Installed & Available
9	W 110 NO.1	Installed & Available
10	Astor	Installed & Available
11	Newtown	Installed & Not Commisioned
12	York	Delivered & In Stores
13	Greenwood	Installed & Available
14	Water Street	Installed & Available
15	West 50th Street	Installed & Available
16	West 60th Street	Installed & Available
17	Elmsford Substation	Delivered & In Stores
18	Mobile Set*	availabel by May 15, 2010
19	Mobile Set*	availabel by May 15, 2010
20	Mobile Set*	availabel by May 15, 2010

*The sets and the vehicles are already delivered and will be put together in the next few weeks.

Since the November 1, 2009 report, 35 additional 27kV feeders have been subjected to an AC VLF Hipot test. The results are contained in Table 2, below.

**Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010**

Table 2: AC Hipot Test Data - October 25, 2009 Through April 26, 2010						
Network	Voltage Level	Network ID	Feeders Tested	Number of Tests	Number of Passed Tests	Number of Failed Tests
Park Slope	27kV	2B	1	1	1	0
Crown Heights	27kV	3B	1	1	1	0
Ridgewood	27kV	5B	1	2	1	1
Williamsburg	27kV	6B	3	3	3	0
Bay Ridge	27kV	8B	1	1	1	0
Sheepshead Bay	27kV	10B	2	4	3	1
Brighton Beach	27kV	11B	2	6	4	2
Long Island City	27kV	1Q	11	13	12	1
Rego Park	27kV	3Q	1	1	0	1
Jamaica	27kV	5Q	3	7	4	3
Maspeth	27kV	6Q	1	1	1	0
Flushing	27kV	7Q	6	8	6	2
Richmond Hill	27kV	9B	1	4	0	4
Jackson Heights	27kV	9Q	1	2	0	2
Harlem	13kV	2M	4	4	4	0
City Hall	13kV	8M	1	1	0	1
Plaza	13kV	11M	1	1	1	0
Battery Park City	13kV	18M	1	1	1	0
Fulton	13kV	27M	4	5	5	0
Herald Square	13kV	28M	6	13	10	3
Triboro	13kV	44M	10	13	12	1

Status Report (November 1, 2010)

Very Low Frequency Testing

The Company has received delivery of 17 stationary Very Low Frequency (VLF) test sets for installation at various 27 kV and 13 kV substations. The operational status of the 17 VLF test sets is listed in Table 1, below. The substation selection for new test set installations is based on the amount of solid dielectric cable installed as well the available space in the existing substations.

In addition to the three mobile test sets currently in use, we have completed a revised design for the installation three additional VLF test sets in trucks. These additional test sets have been commissioned and are currently available for use.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

<u>Table 1: AC VLF Test Set Inventory</u>		
Set	Substation	Status
1	North Queens	Installed & Available
2	Corona	Installed & Available
3	Parkview	Installed & Available
4	Rockview	Installed & Available
5	Seaport	Installed & Available
6	Brownsville	Installed & Available
7	Trade Center	Installed & Available
8	Jamaica	Installed & Available
9	W 110 NO.1	Installed & Available
10	Astor	Installed & Available
11	Newtown	Installed & Available
12	York	In Stores
13	Greenwood	Installed & Available
14	Water Street	Installed & Available
15	West 50th Street	Installed & Available
16	West 60th Street	Installed & Available
17	Elmsford Substation	In Stores
18	Mobile Set	Commissioned and Available
19	Mobile Set	Commissioned and Available
20	Mobile Set	Commissioned and Available

Since the May 1, 2010 report, 20 additional 27kV feeders have been subjected to an AC VLF Hipot test. The results are contained in Table 2, below.

**Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010**

Table 2: AC HiPots Performed - May 1, 2010 through October 12, 2010							
CSA	Network ID	Network Name	Voltage Level	Feeders Tested	Tests Performed	Passed	Failed
Brooklyn	2B	Park Slope	27kV	1	1	1	0
Brooklyn	3B	Crown Heights	27kV	1	3	3	0
Brooklyn	4B	Flatbush	27kV	1	1	1	0
Brooklyn	5B	Ridgewood	27kV	6	9	5	4
Brooklyn	6B	Williamsburg	27kV	3	4	4	0
Brooklyn	7B	Ocean Parkway	27kV	1	1	1	0
Brooklyn	8B	Bay Ridge	27kV	1	1	1	0
Brooklyn	10B	Sheepshead Bay	27kV	1	1	1	0
Brooklyn	11B	Brighton Beach	27kV	4	14	10	4
Brooklyn	12B	Prospect Park	27kV	1	1	1	0
Manhattan	2M	Harlem	13kV	7	8	7	1
Manhattan	18M	Battery Park City	13kV	1	1	1	0
Manhattan	24M	Lenox Hill	13kV	1	1	1	0
Manhattan	27M	Fulton	13kV	1	1	0	1
Manhattan	28M	Herald Square	13kV	2	2	2	0
Manhattan	34M	Park Place	13kV	1	2	2	0
Manhattan	39M	Hudson	13kV	1	1	1	0
Manhattan	44M	Triboro	13kV	4	4	4	0
Queens	1Q	Long Island City	27kV	1	1	1	0
Queens	2Q	Borden	27kV	1	1	1	0
Queens	5Q	Jamaica	27kV	11	17	15	2
Queens	7Q	Flushing	27kV	6	8	5	3
Queens	9B	Richmond Hill	27kV	7	13	3	10
Queens	9Q	Jackson Heights	27kV	1	1	1	0
Bronx	5X	Northeast Bronx	13kV	1	1	1	0

II-15 Con Edison should monitor the loading of high-tension customers' transformers as part of its system modeling programs.

Summary of Prior Actions

The Company has been working on developing a high tension monitoring system since 2000. The monitoring of high-tension customer loads requires the development of a variety of components, including sensors to obtain the data in a format that can be transmitted directly into the Company's existing analytical and modeling programs, a communications platform to transmit the data to the control center, and sensors that can withstand harsh underground environmental conditions.

Major challenges must be addressed in order to develop a reliable high tension monitoring solution:

- **Reliable Communications:** The majority of the high tension monitoring locations are inside customer basements and sub basements that are constructed from steel reinforced concrete walls. As such, these locations naturally pose a challenge to the cellular based wireless communications. Moreover, using wireless communication technology from external carriers significantly limits the Company's ability to maintain a minimum reliability standard.
- **Customized Solution:** The complexity and physical conditions at each high tension location requires a customized communication solution that may require a combination of communication technologies such as cellular based wireless, optic fiber and power line carrier. There is no standard solution for all locations, and each location requires a preliminary field survey, engineering analysis and validation.
- **Data Accuracy:** Any viable high tension monitoring solution must provide a minimum data accuracy standard for billing purposes. Reliable and accurate data measurements are also necessary for primary modeling.
- **Customer Equipment and Access:** The majority of the high tension equipment is customer owned and requires customer permission and coordination. Getting access to the customer premises to install and test the monitoring devices has proven to be challenge; as unescorted access is prohibited by most customers due to security reasons.

The Company has tested various technologies that included modifying the existing Remote Monitoring System infrastructure to leverage power line carrier communication technology in conjunction with hardened sensors for installation in RMS-equipped structures. This initiative was unsuccessful as it relied on current transformers specifically designed to monitor the high tension load that proved to be unreliable and presented some safety concerns.

Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010

In 2006, the Company partnered with AMT to develop a high tension service data collection infrastructure called High Tension Monitoring Data Acquisition System (HTMDAS) and a communication interface using wireless technology. In 2007, the Company began to install the data collection backend of the HTMDAS. This initial deployment includes the installation of one dedicated T1 line that will be used to accumulate data over a dedicated server.

The Company initiated a pilot high tension monitoring program in 2007.

Status Report (May 1, 2010)

All vendor negotiations and support contracts have been finalized. We have begun deployment and have installed a total of 61 high tension (HT) monitoring units (DCX devices) at HT customer locations system wide—including the upgrade of all pilot units. We plan to install a total of 470 units by the end of 2010.

Deployment was temporarily delayed due to the imposition of more stringent cyber security requirements in regards to HT data. A final device firmware has been undergoing testing and will be applied to our inventory of DCX devices in the upcoming weeks. This firmware revision will give the device the capability to encrypt data using an AES-256 block cipher.

The internal infrastructure needed to backhaul, integrate and archive HT data is operational and is currently processing data from all devices currently in the field. Modeling systems are being revised to incorporate HT data and will provide improved network model accuracy as we monitor more HT customer installations in a given network.

The following is a breakdown of DCX unit installations by region to date:

Manhattan 29 units
Brooklyn/Queens 12 units
Bronx/Westchester 11 units
Staten Island 9 units

Status Report (November 1, 2010)

We continue our system wide deployment and have installed a total of 306 high tension (HT) monitoring units (DCX devices) at HT customer locations system wide. We plan to install a total of 470 units by the end of 2010.

As stated in our last report, deployment had been temporarily delayed due to the imposition of more stringent cyber security requirements in regards to HT data. Our device firmware has passed all testing and meets encryption requirements and is now applied to all our new DCX devices.

Modeling systems are being revised to incorporate HT data and will provide improved network model accuracy as we monitor more HT customer installations in a given network.

**Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010**

A number of locations require customized antenna installation solutions to insure continuous and reliable service. For this purpose, we are currently testing a number of signal strength amplifiers. We are looking to have significant signal strength gains. As stated in previous reports, access to high tension customer sites continues to be a challenge since every field visit requires the company to arrange visits outside of the billing cycle. Access is depended on customer personnel availability. However, we will continue to work closely with our customers to streamline this process.

The following is a breakdown of DCX unit installations by region to date:

Manhattan 98 units
Brooklyn/Queens 119 units
Bronx/Westchester 68 units
Staten Island 21 units

**Con Edison's Status Report on Implementation of Washington Heights Recommendations
November 1, 2010**

II-17 Con Edison should determine which recommendations in its report on the July 1999 outage, and in the report of the Review Board, need to be completed immediately to improve reliability for the summer of 2000 and implement them expeditiously. The company should report to the Commission on all of the recommendations, explaining its implementation plans and status.

Status Report (November 1, 2010)

Con Edison is submitting a November 1, 2010 status report on its Action Plan.