Initial Report On The Power Outages In Northwest Queens In July 2006

August 2, 2006

[1] Customer names, phone numbers and other employee specific data have been redacted.

EXECUTIVE SUMMARY

This report focuses on the power outages that recently took place in the Long Island City (LIC) network, the process used to determine customer outages, and the factors evaluated in deciding to keep the network operating. Con Edison is proceeding with an analysis of the facts and based upon that analysis will reach conclusions as to the factors contributing to the cause of the outage. The final report will contain recommendations for actions needed as a result of the conclusions and a schedule for implementation.

On Monday, July 17, 2006, at 15:50, the LIC network experienced the loss of one of its 22 primary feeders. Over the next several hours, the network experienced the loss of five additional feeders, putting the network into a sixth contingency. Our system operator reduced the voltage in the LIC network by 8% at 18:54 in order to reduce electric demand. Representatives from our Emergency Management Group contacted the New York City Office of Emergency Management (NYCOEM) and provided frequent updates on significant changes to the condition of the LIC network. We called critical customers, including those on Life-Sustaining Equipment (LSE), beginning at 19:30 to apprise them of the system's status.

On Tuesday, July 18, as repairs were completed and feeders restored, additional primary feeders failed, and at 20:38 the network had 10 of its 22 feeders out of service at one time. Con Edison worked closely with NYCOEM and with customers to further reduce electric usage in the area. We used demand side management programs, worked with large customers,[2] and maintained the 8% voltage reduction. We estimated these steps reduced electric demand by 43 megawatts (MW)

[2] Large customers typically receive electric service directly from several feeders (rather than the secondary network) making them more susceptible to losing power as a result of feeder outages. In addition, their large size makes contacting them the most efficient way of obtaining voluntary load reduction that benefits all customers.

on Tuesday, July 18, and 67 MW on Wednesday, July 19. Partly because of these demand-reduction measures, operating personnel decided to maintain the network in service and avoided an outage to all of the approximately 115,000 customers in LIC network.

Between midnight Tuesday and noon Wednesday, we repaired and restored one feeder but subsequently two additional feeders went out of service. For 97 minutes, between 11:33 and 13:10, 10 of the 22 feeders were out of service. We made repairs through the afternoon and evening, restoring three feeders by midnight.

On Wednesday night, as crews continued to repair and restore the primary feeders, the number of feeders out of service declined to seven shortly after midnight Thursday morning and to three feeders out of service at 13:48 on Thursday. The primary feeder system was restored to its design condition at 06:38 Friday when a feeder was restored to service. By 08:01 Friday morning, all feeders were returned to service. Nonetheless, the series of feeders out of service caused damage to the 120/208 volt secondary grid, which resulted in outages to approximately 25,000 customers.

In the case of these outages, the customer counts initially provided by the company were clearly a poor estimate of the actual customers out of service. Through the end of the day on Wednesday, July 19, our call center received 1,977 calls reporting electrical problems in the LIC network. Our customer outage system provides operating personnel with the total number of customers interrupted based on these calls. Based upon field observations, there was a concern that this system was significantly underestimating the extent of the outage. On Thursday

evening, July 20, we conducted a survey in order to estimate the number of customers affected, and as a result estimated that 25,000 customers were out of service. These events have demonstrated that we need a better system to provide an early estimate of how many customers are without power on network systems.

On Thursday, July 20, we continued to identify and restore the damaged sections of the secondary grid. Our assessment indicated open switches, blown fuses, and open secondary cable and connections throughout the affected portion of the network. It was this secondary-system damage that knocked out power to many homes and businesses.

All available Con Edison resources were called upon to aid in the restoration effort. In addition, Con Edison requested underground crews from many utilities in the Northeast, Mid-Atlantic, and Midwest, including American Electric Power in Ohio, Duquesne Light in Pittsburgh, KeySpan/LIPA, National Grid, NSTAR from Massachusetts, NYSEG, PEPCO from Washington, D.C., and Public Service Electric and Gas. In total, more than 200 employees from other utilities and contractors supplemented our workforce. Work continued on a 24-hour basis to install new underground cables and replace blown cable fuses. By midnight on Sunday, July 23, approximately 20,000 customers had been restored. On Wednesday morning, July 26, outage restoration efforts were completed and all customers were restored.

1. ELECTRICAL SYSTEM OVERVIEW

a. POWER DELIVERY SYSTEM

Con Edison delivers electricity to 3.2 million customers in New York City and Westchester County – a service territory of 660 square miles with a population of approximately 9 million people. Electricity is delivered through approximately 95,000 miles of underground cable and 33,000 miles of overhead cable. As shown in figure 1, below, the electric power system comprises three distinct sub-systems: generation, transmission, and distribution.

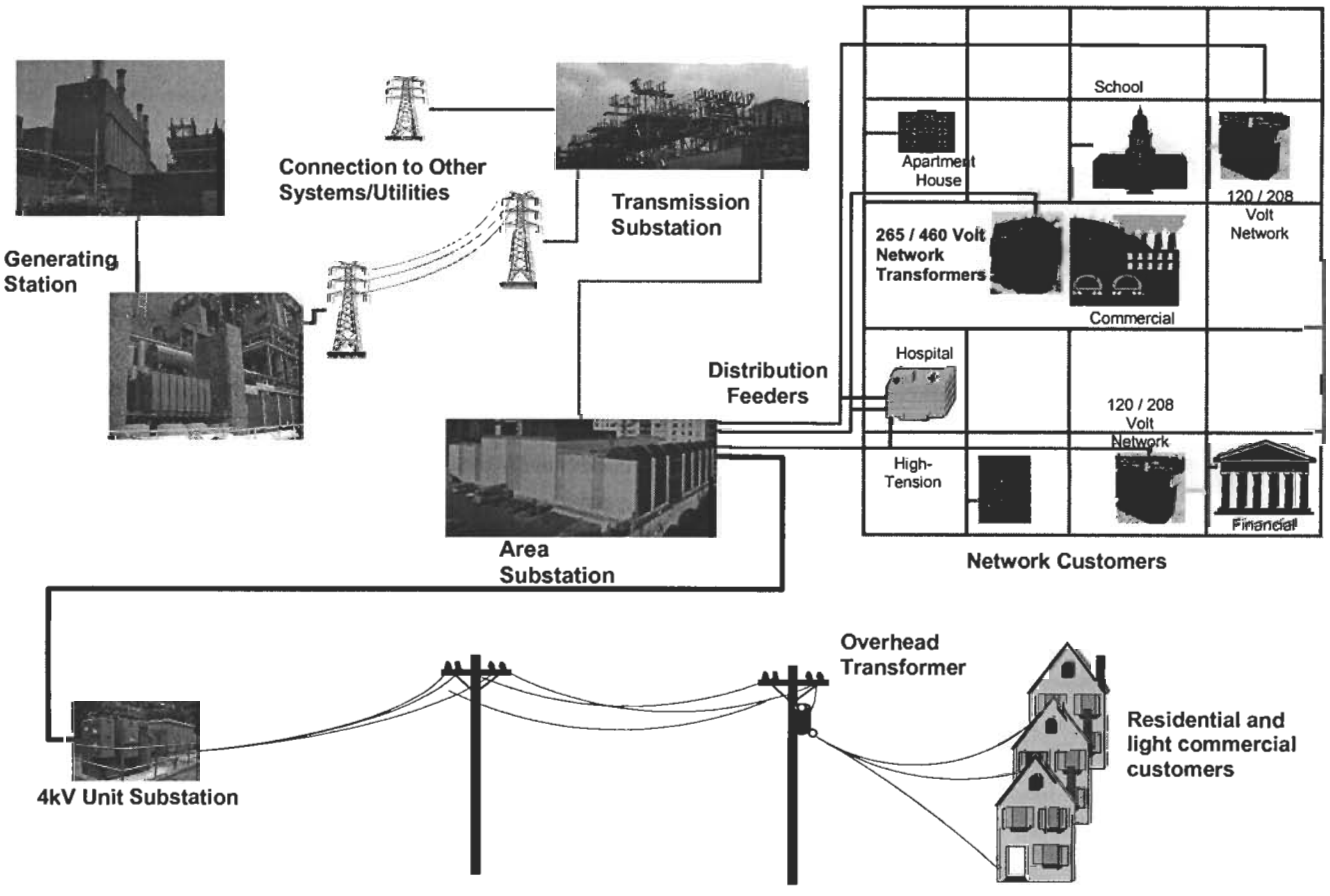

Figure 1: The Power Delivery System

Central power plants[3] generate electricity that is transmitted using high-voltage transmission lines (69,000, 138,000 and 345,000 Volts) that have the capability of delivering electricity over long distances. High-voltage transmission substations interconnect the generating facilities located in New York City and Westchester with those upstate and elsewhere. Con Edison's bulk power transmission system enables delivery of power through the New York Independent System Operator (NYISO) from plants within New York state with transmission lines that connect to adjacent areas. Generally, at least two or more transmission lines supply area substations where the voltage is reduced to 27kV for Brooklyn and Queens, 33kV and 13kV for Staten Island, and 13kV for Manhattan, the Bronx and Westchester.

From the area substations, primary feeders distribute the power and feed a secondary system. One type of secondary system is a called a network system in which each feeder supplies a network grid of transformers located throughout local streets. These transformers serve to further reduce the voltage for use by customers. Depending upon the size and electric demand of the area, a network may have from eight to 28 primary high-voltage feeders connecting the network to the area substation.

There are 46 area substations in New York City. These area substations serve 57 networks in New York City with 1,070 primary feeders. The primary feeders operate at high voltages and supply electricity to transformers throughout the network. The network transformers reduce the voltage to 120 volts and supply the secondary grid. Both primary feeders and secondary cables

[3] Since the restructuring of the industry in the late 1990s, Con Edison sold most of its large electric generating plants.

run through underground structures, such as manholes and service boxes. The Con Edison system has approximately 274,000 underground structures.

Approximately 86% of the electricity delivered by Con Edison is carried by the underground network distribution system. The remaining 14% is non-network, which includes radial and primary auto-loop systems, Underground Residential Distribution (URD) systems, and 4kV supply. The design of the network system (which includes approximately 80,000 miles of underground cable in New York City) provides superior reliability when compared to the non-network system because there are multiple paths for the electricity flow to supply customers and because it is located largely underground where it is not subject to wind or ice storms. However, repair work and installations on an underground system are typically more difficult and time consuming.

Each of the networks is designed to operate independently. The design also allows all networks to have two feeders out of service, for maintenance or any other reason, without affecting overall customer service.

In addition to separating networks, reliability is further enhanced by the installation of fuses or cable limiters at strategic locations along the low-voltage cable mains. The limiters isolate any electrical problems within the network. Limiters also help ensure that only a minimum number of customers will be without power if low-voltage secondary cable mains and/or service failures occur.

In addition to transmitting and distributing electricity to customers, Con Edison also works with the New York Independent System Operator (NYISO) and customers to manage electric usage through demand management programs such as Direct Load Control (DLC). The DLC program pays customers to allow Con Edison to lower their central air conditioning electric usage during peak demand periods. This is one of many demand side tools that Con Edison uses to manage the system at peak loads.

b. PRIMARY FEEDERS

The following is a simplified diagram of the primary feeders in the network.

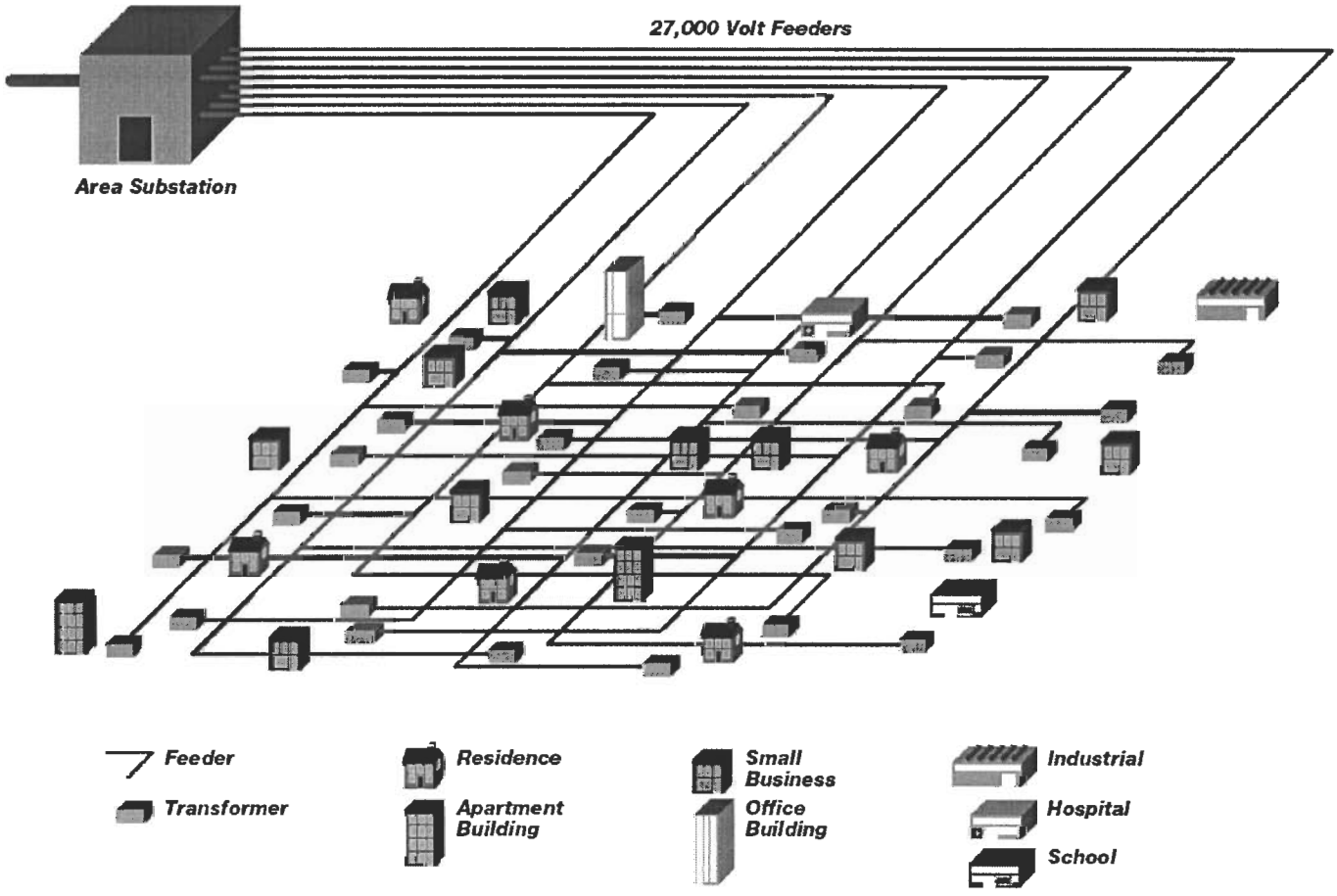

Figure 2. Illustration of Con Edison's Primary Feeder System

Figure 2, above, displays eight 27,000-volt primary feeders delivering electricity to a network. The primary feeders supply electricity to numerous transformers (shown as blue boxes) that supply electricity to most customers via the network. Large customers (over 1MW), however, are typically fed directly by several primary feeders. As a result, large customers are typically more susceptible to feeder outages and will be contacted when multiple feeder contingencies exist and may be asked to voluntarily reduce load to help themselves and the system.

Underground networks are designed to provide service even when any two of the primary feeders supplying the network are out of service. This is known as a "second-contingency" design criterion. The second-contingency criterion applies to the major networks in Manhattan, Brooklyn, Queens, and the Bronx where electric usage density is the highest. It allows feeders to be removed from service for maintenance, modification, and additions or extension. If cable and equipment failures occur, repairs or replacements require some amount of time to complete. Safely locating and repairing a fault or short circuit on a high-voltage underground cable is a complicated and time-consuming process requiring coordination among several departments. A substation operator initiates the fault-locating test signals on the damaged feeder allowing a field operations crew to follow those signals along miles of cables to the fault. Cable crews then replace the damaged cable section or joints, and splicing teams connect the new cables to the existing feeder cables.

Selected primary feeders are tested annually to discover incipient faults before failure and mitigate primary feeder outages. Feeders are selected for testing based on past performance history, composition in terms of component type, and the relative support the feeder provides to

the network. Based on these characteristics, a composite index of the likelihood of poor feeder performance and potential adverse network effects due to that performance is derived. Using this index, network feeders are prioritized and tested.

c. SECONDARY NETWORK

Figure 3 is a simplified diagram of the secondary cables in the network.

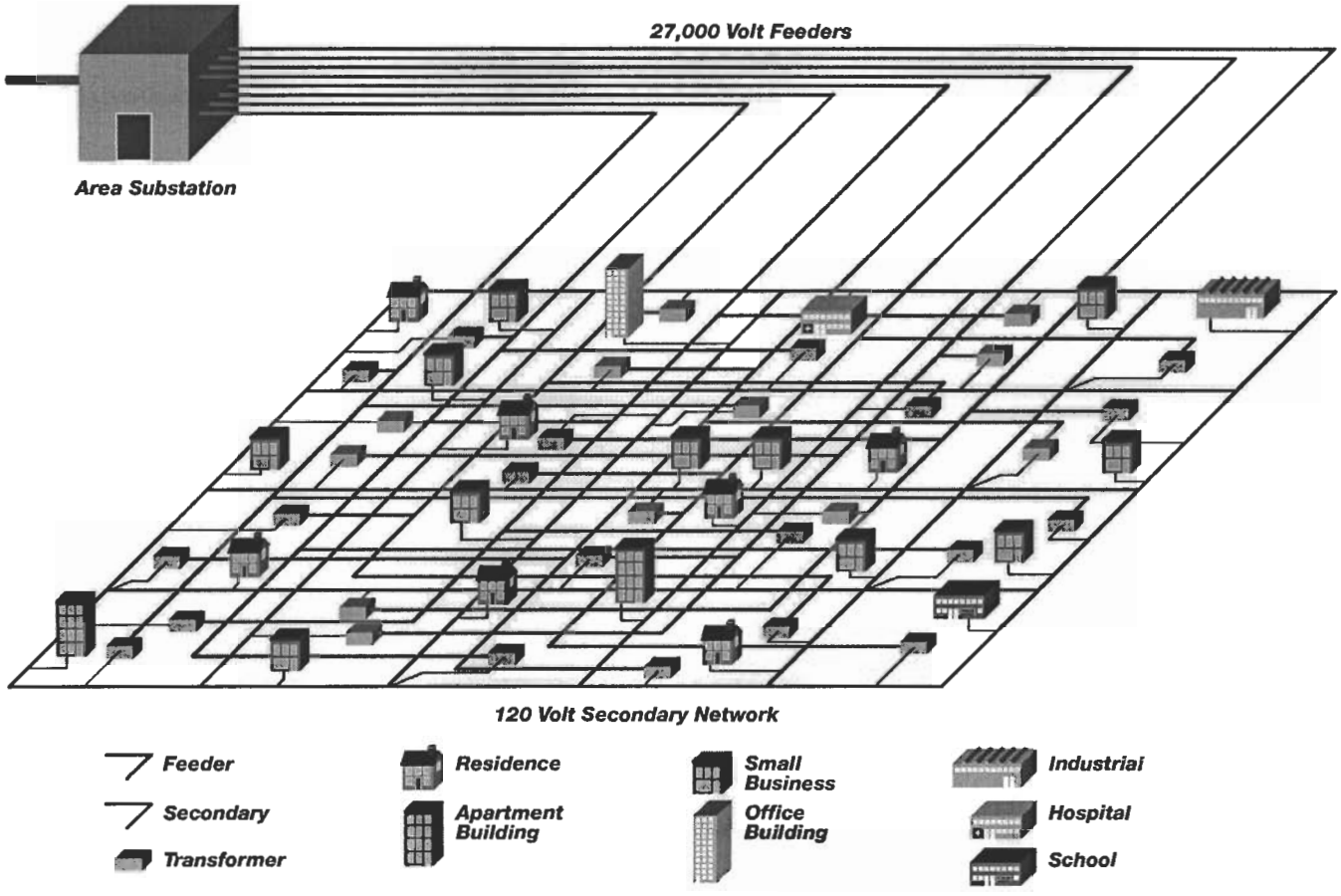

Figure 3: Illustration of Con Edison's primary and secondary network system

The secondary grid consists of multiple sets of low-voltage cable mains (also referred to as mains) installed in ducts under the streets and connected at the cross points in manholes or shallow service boxes. Customers receive their electricity from these cables. Each secondary grid

is a network of cables that allows the electricity to flow over numerous paths, providing a very high level of reliability. (Figure 3, above, displays the secondary grid in blue.) Unlike a radial system, where the path that electricity flows to a customer is known, on a network system, with its redundancy, the exact path is not known. Therefore, even though primary feeder and transformer conditions are known, the condition of the secondary low-voltage system is not known.

This arrangement also helps maintain circuit continuity after a cable fault where parallel conductors are used. Limiters (fuses) are installed at the junction points of the grid. The limiter (fuse) is designed to open or "clear" and protect cable insulation from faults on the secondary grid; its design is coordinated with the fuses in the network protectors.

Underground network supply is reliable because the system is shielded from the effects of wind, trees, ice, lightning, and damage from vehicles. In 2005, LIC network customers in particular experienced service reliability of less than three interruptions per thousand customers served per year, which is in the top quartile of the Con Edison networks and is over 400 times better than the average customer experience in New York state.

2. Overview of the Long Island City (LIC) Network

The Long Island City (LIC) network serves northwest Queens and includes the neighborhoods of Long Island City, Astoria, Sunnyside, Woodside, and Hunters Point. The area is bounded by the East River on the west and north, the Brooklyn-Queens Expressway on the east, and Newtown Creek on the south (see figure 4).

The network is supplied by the North Queens substation through 22 primary feeders, totaling approximately 290 circuit miles in length, and 1,194 network transformers. They supply electricity in an extensive underground system of 4,400 manholes, 11,000 service boxes, and 1,700 miles of secondary cable, and on 3,000 utility poles, all of which combine to deliver power to approximately 115,000 customers.

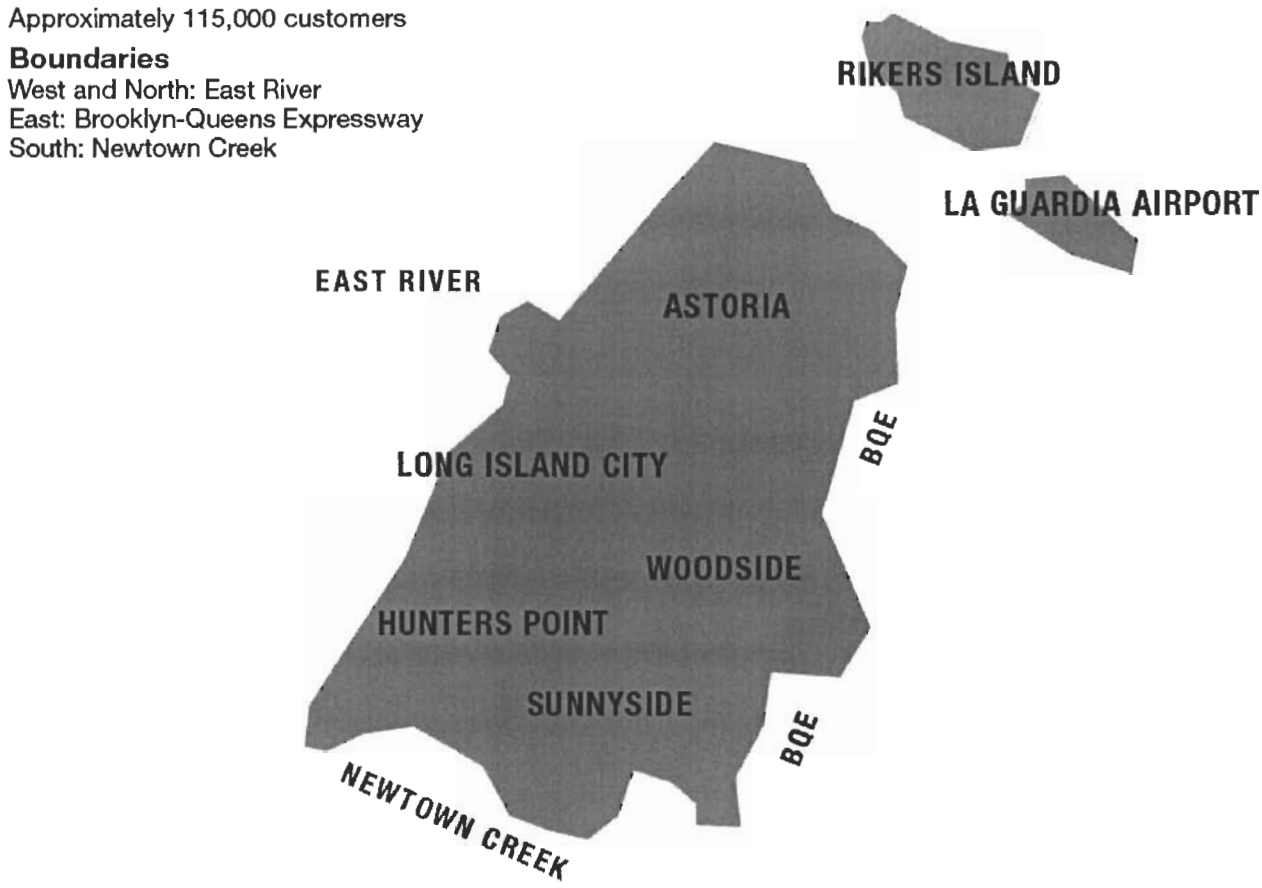

Figure 4: Map of Con Edison's Long Island City Network Boundaries

In 2006, the forecasted peak demand for the Long Island City network is 395 MW. Commercial customers' electric demand is estimated to be 300 MW and residential customers' electric demand is estimated to be over 100 MW. The two demands, however, do not occur at the same time. The weekday demand cycle is shown below and the network generally peaks between 14:00 and 18:00 (see figure 5 below). Weekend customer demand in the network is estimated to be 269 MW, approximately 68% of the weekday peak. The demand cycle reflects the increase in consumption over the course of a given weekday or weekend as customers use more or less electricity.

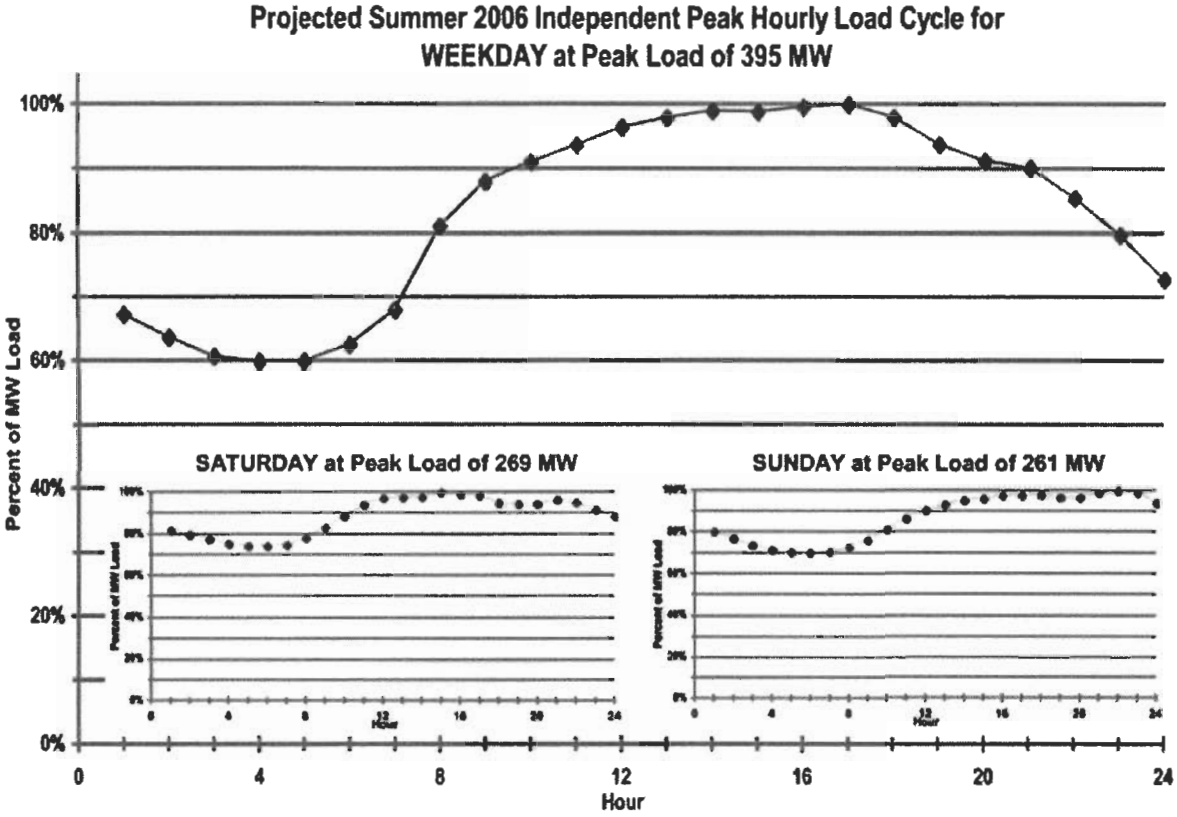

Figure 5: Long Island City Network Hourly Demand Cycle

3. Sequence of Events

a. Chronology of Events

The chronology below provides an overview of events and communications that occurred between the start of the feeder outages at 15:50 on Monday, July 17, through Friday, July 21. Feeders in the LIC network are designated by their prefix "1" which identifies the network and "Q" which identifies the borough. The two-digit number following the borough designation distinguishes the specific feeder. For example, feeder 1Q01 designates the first feeder in the LIC network in Queens.

Monday, July 17, 2006

15:50	27 kV primary feeder 1Q17 de-energizes and the Long Island City (LIC) network is in first contingency
16:22	27 kV primary feeder 1Q16 de-energizes and the LIC network is in second contingency
16:40	Bowery Bay Water Treatment Plant went on voluntary load reduction because of two of four supply feeders out of service. (1Q16 &1Q17)
17:09	LIC network demand peaks at 382 MW
18:48	Bus Section 3 South at North Queens Substation de-energized, 27 kV primary feeders 1Q07, 1Q15, and 1Q21 and the LIC network is in 5th Contingency
18:54	8% Voltage Reduction implemented in LIC network
19:10	Feeder 1Q15 restored to service, LIC network in fourth contingency.
19:30	Automated message communicated 8% voltage reduction in our Long Island City network area in Queens.
19:30	Initiated calls to large and sensitive customers apprising them of the situation and in some cases requesting them to reduce electric consumption

19:48 27 kV primary feeder 1Q02 de-energizes and the Long Island City (LIC) network is in fifth contingency

20:00 Rikers Island placed 4 buildings on backup generation because of one of four supply feeders out of service. (1Q02)

20:00 New York State Public Service Commission staff was provided status of LIC network

20:08 Feeder 1Q02 restored to service: LIC network in fourth contingency.

20:45 Press release urges customers in northwest Queens to reduce their use of electricity

21:43 27 kV primary feeder 1Q20 de-energizes and the LIC network is in fifth contingency

21:49 27 kV primary feeder 1Q01 de-energizes and the LIC network is in sixth contingency

23:21 Feeder 1Q17 restored to service, LIC network in fifth contingency

23:30 Representative from NYPD reports to Brooklyn/Queens Command Center

23:59 17 reported customer outages

Additional Efforts throughout the Day

- Press office requests media to alert customers in Queens to curtail energy use.
- Automated message indicates that voltage reduction should have no impact on service and offers customers the option to report electric service problems.
- Customer Operations calls customers using Life-Sustaining Equipment (LSE) about voltage reduction.
- Emergency Management initiates conference calls with Office of Emergency Management (OEM) to advise them of feeder problems in Queens and impact on major customers such as La Guardia Airport, Rikers Island, Bowery Bay Pollution Plant and MTA.

- By the evening news broadcasts, we specified our concerns about northwest Queens and the media responded by airing the messages on radio and TV.

Tuesday July 18, 2006

01:00	Office of Emergency Management representative reports to Distribution Engineering Command Post
06:10	Press release urges customers in northwest Queens to reduce their use of electricity
07:00	Two additional OEM representatives report to Distribution Engineering Command Post
07:55	NYPD is asked to make public announcements to curtail energy usage
07:55	Rikers Island places five buildings on generation because of one of four supply feeders out of service. (1Q01)
08:23	27 kV primary feeder 1Q02 de-energizes and the LIC network is in sixth contingency
08:30	OEM reports partial outage at LaGuardia airport to Distribution Engineering Command Post. Three of four supply feeders were out of service. (1Q16, 1Q20 &1Q21)
08:35	Rikers Island places seven buildings on generation because of two of four supply feeders out of service. (1Q01 & 1Q02)
09:00	Con Edison Government Relations initiates notifications to public officials regarding status of LIC network.
09:33	Feeder 1Q16 restored to service, LIC network in fifth contingency.
10:00	Conference call with NYCOEM updating status of LIC network
11:00	NYPD states that they will have two loudspeaker vans patrolling Long Island City area requesting energy conservation
11:37	Feeder 1Q07 restored to service, LIC network in fourth contingency.

11:55 27 kV primary feeder 1Q17 de-energizes and the LIC network is in fifth contingency. Con Edison requests assistance from American Red Cross in Long Island City

11:56 LIC Network demand peaks at 308 MW

12:44 Con Edison implements reduction of non-essential load at all facilities

13:05 Rikers Island places 13 buildings on generation because of two of four supply feeders out of service. (1Q01 & 1Q02)

14:00 Company personnel dispatched to distribute energy conservation fliers

14:35 Representative from Homeland Security updated on the status of LIC area and LaGuardia Airport

15:14 27 kV primary feeder 1Q18 de-energizes and the LIC network is in sixth contingency

20:05 27 kV primary feeder 1Q13 de-energizes and the LIC network is in seventh contingency

20:33 27 kV primary feeders 1Q12 and 1Q15 de-energize simultaneously and the LIC network is in ninth contingency

20:38 27 kV primary feeder 1Q16 de-energizes and the LIC network is in 10th contingency

20:53 Feeder 1Q01 restored to service, LIC network in ninth contingency

21:20 Bowery Bay Water Treatment Plant on backup generation because of three of four supply feeders out of service. (1Q15, 1Q16 &1Q17)

21:26 Feeder 1Q13 restored to service, LIC network in eighth contingency.

21:46 Feeder 1Q18 restored to service, LIC network in seventh contingency.

21:50 27 kV primary feeder 1Q18 de-energizes and the LIC network is in eighth contingency

22:25 27 kV primary feeder 1Q19 de-energizes and the LIC network is in ninth contingency

23:59 225 reported customer outages

Additional Efforts throughout the Day

- During this period, operating personnel were reviewing information from various systems. Individual feeder electric flow was being monitored and the ongoing feeder repairs, testing, and restoration steps closely coordinated. Operators continuously assessed the condition of the LIC network. Electric consumption had been decreasing for several hours and was forecasted to continue decreasing. Based upon an assessment of the information reviewed, operating personnel decided that shutting down the entire network was not necessary.
- Con Edison press office continues to request media to alert customers in Queens to curtail energy use.
- Con Edison continues to contact all large/sensitive customers in the network requesting non-essential load to be curtailed.
- Working very closely with the NYCOEM and with customers to reduce customer usage in the area, we were able to reduce consumption on the entire network. Several customers significantly reduced their usage or went on their own generation to assist. These customers included: NYC Transit, NYCHA, Board of Education, Department of Corrections, DEP's Bowery Bay Plant, LaGuardia Airport, Triborough Bridge and Tunnel Authority, Long Island Railroad, CitiCorp, and Met Life.
- Our Emergency Management group continuously updated representatives from the NYCOEM and NYPD who were present at our Distribution Engineering Command Post. They also participated in regular scheduled conference calls with NYCOEM. We also dispatched Company personnel to support the activation of the NYCOEM Emergency Operation Center in Brooklyn.

- Customers calling Con Edison heard a message to cut back on usage of non-essential appliances.
- Public Affairs continued to contact the elected officials (refer to Section D, Communications).

Wednesday July 19, 2006

00:00 Feeder 1Q19 restored to service, LIC network in eighth contingency

00:06 27 kV primary feeder 1Q19 de-energizes and the LIC network is in ninth contingency

05:00 Press release urges customers in northwest Queens to reduce their use of electricity

06:19 Feeder 1Q21 restored to service, LIC network in eighth contingency

08:27 NYPD Operations notified on status of LIC network

08:33 Con Edison implements reduction of non-essential load at all company facilities

08:51 27 kV primary feeder 1Q14 de-energizes and the LIC network is in ninth contingency

08:57 LIC Network demand peaks at 224 MW

09:00 Con Edison establishes presence at Ditmars Blvd. and Steinway St. to answer questions and address concerns.

09:00 Con Edison Government Relations continues notifications to public officials regarding status of LIC network

11:33 27 kV primary feeder 1Q01 de-energizes and the LIC network is in 10th contingency

11:40 Rikers Island placed on full backup generation because of all four of the supply feeders were out of service. (1Q01, 1Q02, 1Q14, &1Q15)

13:10 Feeder 1Q20 restored to service, LIC network in ninth contingency.

13:37 Feeder 1Q12 restored to service, LIC network in eighth contingency.

16:00 Press release "Statement from Con Edison" (regarding power outages)

16:15 Press release "Con Edison distributes ice to residents in Queens"

19:05 Feeder 1Q02 restored to service, LIC network in seventh contingency.

19:59 Six generators are made available at various locations in LIC.

20:41 Feeder 1Q17 restored to service, LIC network in sixth contingency.

21:29 27 kV primary feeder 1Q17 de-energizes and the LIC network is in seventh contingency

23:59 1,118 customer outages reported

Additional Efforts throughout the Day

- Chief Executive Officer and other executives from the company briefed the Mayor of New York and members of his staff at City Hall about the current status of the electric grid in the Long Island City network in the morning.
- Energy Services requested Transit Authority, Housing Authority and large customers including CitiCorp and Met Life to reduce electric consumption. Transit Authority took action to suspend or reduce service on six subway lines.
- Public Affairs continued to update elected officials.

Thursday July 19, 2006

00:46 Feeder 1Q18 restored to service, LIC network in sixth contingency.

04:33 Feeder 1Q19 restored to service, LIC network in fifth contingency.

04:45 Press release "Con Edison continues to urge customers in northwest Queens area to reduce their use of electricity"

06:36 Feeder 1Q14 restored to service, LIC network in fourth contingency.

12:38 Feeder 1Q17 restored to service, LIC network in third contingency

13:37 27 kV primary feeder 1Q07 de-energizes and the LIC network is in fourth contingency

13:48 Feeder 1Q15 restored to service, LIC network in third contingency

17:09 LIC Network demand peaks at 218 MW

21:00 Press release "Con Edison asks customers with power in northwestern Queens to leave a light on overnight"

23:59 1,601 Customer outages reported

Additional Efforts throughout the Day

- Customer Operations initiated distribution of ice at various locations, provided guidance on submitting claims, and addressed special requests that required field attention.
- Operation field crews identified and restored some secondary damage to the secondary system.
- Public Affairs continued to update local elected officials
- Arranged generators at specific locations.
- Customer Operations initiated drive-by surveys in the evening to visually inspect areas affected by the northwest Queens outage.
- Customer Operations asks NYPD to make house calls on customers who were on life sustaining equipment, but who haven't responded to calls.
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Friday, July 21, 2006

05:30 Press release "Con Edison crews continue working to restore power in Queens"

06:37 Feeder 1Q07 restored to service, LIC network in second contingency

07:49 Feeder 1Q16 restored to service, LIC network in first contingency

08:01 Feeder 1Q01 restored to service, LIC network in zero contingency

08:30 Call Center carries new outage number and Emergency Management stays in constant contact with OEM and NYPD, communicating significant system changes as they occurred

09:00 Press release "Con Edison estimates 25,000 customers without power in Northwest Queens; restoration efforts to continue through the weekend"

Additional Efforts throughout the Day

- OEM and NYPD personnel at both Distribution Engineering Command Post and Corporate Emergency Response Center (CERC), working with Emergency Management.
- Company represented at NYPD staging area in Astoria Park and continued to ask customers to report outages.
- Public Affairs continued to update local elected officials.
- Delivered claims information and ice drop location information to elected officials and local community groups
- Customer Operations continued field surveys to estimate customer outages and verify restorations in the evening.

b. FEEDER RESTORATION STEPS

In order to repair and restore primary feeders to service, a detailed step-by-step process is followed in order to protect the workers. The restoration process of a primary feeder that de-energizes due to a problem involves several departments within the company and sometimes customers. The goal is to expeditiously restore the feeder to service while ensuring safety to personnel.

The network design requires that the various components of the network, such as transformers, switches, reactors, cables, connections, etc., be highly integrated (interconnected). As a result of this complexity, and the need to protect the employees, the process for repairing high-voltage feeders is a fairly complicated and lengthy effort.

When a component (switch, transformer, cable, or connection) on a feeder of our system has a problem, large amounts of energy will rush to the damaged component or "fault." The system utilizes protective switches to de-energize the feeder in order to isolate the faulted component from the system. This action limits the extent of problem, and prevents additional damage to the equipment attached to the feeder.

Once a fault occurs, a step-by-step process is initiated to isolate, locate, and repair the damage. Close coordination across various departments, including District Operations (DO), Regional Electric Control Centers (RECC), Emergency Department (#9), Field Operations Department (FOD), Substation Operations (SSO) and sometimes large-use customers with high-tension equipment, is required for feeder restoration.

The first block of steps involves grounding the feeder at the substation and isolating sources of electrical backfeed on the feeder in order to safely proceed with any work. Sometimes the feeder will remain alive because of energy feeding back from the secondary system through the distribution transformers. The source of this backfeed, which could be anywhere along the length of the feeder, must be located and disconnected by opening switches. Secondary network fuses (limiters) are located to coordinate with the distribution transformer network protector fuses. The sizing of the limiters and the network protector fuses is coordinated in order to allow the network protector to open and prevent any backfeed on the primary feeder. As a result of this coordination, the limiters cannot be installed at all locations. To ground the feeder at the substation, work orders are issued to isolate the feeder from sources of backfeed. Interaction with the customers who have high-tension equipment supplied by the faulted feeder, such as LaGuardia Airport, is necessary in order to isolate the feeder from any source of backfeed on their equipment. This must be done physically in the field or on the customer's premises. Any equipment connected to the feeder at the area substation must be disconnected so that there is no inadvertent supply of energy on the feeder while it is being repaired. The grounding and isolation moves are done in parallel to expedite the repairs.

Once the feeder is grounded and isolated for work, the next block of steps involves locating the problem. Underground primary cables and connections typically transverse a span of miles, and the exact source of the problem needs to be located. The average length of a LIC network feeder is 13 miles.

The process of locating a fault involves applying high voltage on the feeder cables. The high voltage creates a detectable signal at the fault location. Prior to applying high voltage on the feeder, voltage-sensitive equipment, such as shunt reactors or lightning arrestors, is disconnected from the feeder. Next, work orders are issued to establish the high-voltage condition that is used to locate the fault on the feeder. The route of the cable is surveyed with equipment that senses the signal until the fault location is found.

Once the fault is located, the high-voltage condition is removed, and work orders are issued to ground the feeder at the area substation. Vehicles parked over a manhole, flooded underground structures, or environmental conditions can sometimes delay the fault-location process.

After the feeder is grounded at the station, the next block of steps involves preparing the feeder for work. To prepare the feeder for work involves positively identifying the cables at work locations and applying protective grounds surrounding the repair locations. Protective grounds are required to protect the workers from any inadvertent energization of the feeder. To positively identify the feeder, work orders are issued to apply a target ground; then, tracing current (ungrounded direct current) is applied on the feeder from the area substation. Personnel use the tracing current to positively identify the faulted feeder among the other feeders in the structure. They identify the three phases of the feeder and mark the phases through either a certification or registered tag. Once it is reported that the feeder has been identified and tagged, work orders are issued to remove the current and ground the feeder at the area substation. Concurrently, the field personnel apply several protective field grounds at manholes surrounding the work location. With the feeder grounded in the station and the field, the operator reviews the job to verify the

feeder is properly isolated and protected, and then issues a work permit to the initiate the repair work.

Operations personnel determine the scope of the work, typically either making repairs or disconnecting the faulted equipment from the feeder requiring splicing and capping.

A request for a work permit follows. This process is tightly controlled to verify that people are in the correct location and that they follow established procedures. Depending on the nature of the problem, the work crews will disconnect the damaged equipment and/or make the necessary repairs, typically by removing and installing new cable and making cable splices. Because of the need to maintain reliability, the repair process, typically performed in the manholes, is specialized, exacting, and arduous. Even tiny gaps or spaces left under splice coverings can result in future faults.

Once the work permit is issued, the next block of steps involves making repairs or separating the faulted equipment from the feeder. To do so, the working group(s) "signs on" with the control center at each work location. Once the repairs are made and the working group(s) no longer requires the field grounds, this is reported to the control center. Work orders are then issued to remove grounds.

After repairs are completed, the ground switches used for protection are removed and the feeder is then tested by applying low and, subsequently, high voltages to determine there are no additional problems. The high-voltage application during the testing phase can identify any

imminent faults on the feeder. If additional problems are encountered during the testing phase, these steps are repeated until the feeder passes the test.

When all work permits are returned, the next block of steps involves preparing the feeder for service. Orders are issued to perform an "AC Ammeter Clear" test and prepare the feeder circuit breaker for service, if the test is successful. In some cases, additional faults on the feeder may exist. The fault-locating process can only detect one fault at a time. These faults are often found in the testing phase, but can also cause the feeder to cut in and open automatically when it is re-energized. This situation requires that the entire process be repeated to locate and repair any additional faults.

Once the testing passes, the feeder can then be re-energized remotely by the district operator at the substation by closing in the feeder breaker.

There were 10 instances when the LIC network feeders had problems immediately after the feeder was restored to service, and the feeders had to be reprocessed. This increased the time needed to restore these feeders to service.

SEQUENCE OF LIC NETWORK PRIMARY FEEDER OUTAGES

Monday July 17, 2006

New York City was under an intense heat wave on Monday, July 17, with the recorded dry bulb temperature at 96 degrees. The typical LIC network demand cycle peaks between 14:00 and

18:00 on weekdays. At 16:00, the LIC network demand was 376 MW, which was 94% of its forecasted peak summer demand of 395 MW.

At 15:50, 27 kV network feeder 1Q17 de-energized. This resulted in the first contingency in the LIC network with one of the 22 27 kV network feeders out of service. The demand on feeder 1Q17 at the time it de-energized was 495 Amps. This demand was at 54% of its emergency rating of 904 Amps. Feeder cable ratings are based on the amount of current in amperes that the cable can carry. The carrying capacity is based on the cable's maximum rated conductor temperature. Under demand, the conductor temperature is limited by the ability of the cable and its surroundings to dissipate heat and by the cable insulation's temperature resistance characteristics.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 15:50	1	1Q17	94%

At 16:22, a second 27 kV network feeder, 1Q16, de-energized, and the LIC network went into a second contingency. The demand on feeder 1Q16 at the time it de-energized was 644 Amps, 78% of its emergency rating of 824 Amps. The problems on both the feeders (1Q17 and 1Q16) were isolated to cable failures in the same underground structure. Refer to rows 1 and 2 in Table 1 for preliminary analysis. The specific cable failure causes are under investigation.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 16:22	2	1Q17, 1Q16	94%

At 17:00, the LIC network sustained the peak demand for that day of 382 MW; this demand was 97% of the estimated 2006 peak summer demand of 395 MW.

At 18:48, the bus section 3S at the North Queens substation de-energized. As a result, three 27 kV network feeders, 1Q07, 1Q15, 1Q21, and one radial feeder, 1Q81, were de-energized. This resulted in a fifth contingency in the LIC network with feeders 1Q17, 1Q16, 1Q07, 1Q15, and 1Q21 out of service. Radial feeder 1Q81 did not have any impact on the LIC network contingency level, as it connects the North Queens substation to the Astoria Power Plant and does not supply any customers.

The demand on feeder 1Q07 at the time it de-energized due to a bus section outage was 339 Amps, 50% of its emergency rating of 685 Amps. The demand on feeder 1Q21 at the time it de-energized due to the bus section outage was at 500 Amps, 89% of its emergency rating of 773 Amps.

The demand on feeder 1Q15 at the time it de-energized due to the bus section outage at was at 357 Amps, 39% of its emergency rating of 926 Amps.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 18:48	5	1Q17, 1Q16, 1Q07, 1Q21, 1Q15	90%

At 18:54, Con Edison implemented an 8% voltage reduction in order to reduce the demand on the network. Con Edison uses voltage reduction to reduce system demand during periods of contingency.

At 19:02, an attempt to restore the bus section at the North Queens substation was unsuccessful. The bus section immediately de-energized due to a problem on network feeder 1Q21. The problem was identified later as damaged primary cable section. Refer to row 3 in Table 1 for preliminary analysis.

At 19:03, a second attempt to restore the bus section at the North Queens substation was unsuccessful. The problem is under investigation.

At 19:09, the bus section at the North Queens substation was restored to service.

At 19:10, an attempt to restore 1Q07 to service was unsuccessful. The problem was identified later as a damaged joint on the primary feeder cable. Refer to row 4 in Table 1 for preliminary analysis.

At 19:10, feeder 1Q15 was restored to service by closing the feeder circuit breaker at the North Queens substation. This reduced the LIC network contingency level to four.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 19:10	4	1Q17, 1Q16, 1Q07, 1Q21	80%

At 19:48, 27 kV network feeder 1Q02 de-energized, bringing the LIC network into a fifth contingency. The problem was not related to primary cable or joint damage and is under investigation. The demand on feeder 1Q02 when it de-energized was 468 Amps. This demand was 62% of its emergency rating of 758 Amps.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 19:48	5	1Q02, 1Q17, 1Q16, 1Q07, 1Q21	78%

At 20:08, 27 kV network feeder 1Q02 was restored to service, and the contingency level in the LIC network was reduced to four.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 20:08	4	1Q17, 1Q16, 1Q07, 1Q21	75%

At 21:43, 27 kV network feeder 1Q20 de-energized resulting in the fifth contingency in the LIC network. The demand on the feeder when it de-energized was 590 Amps. This demand was 94% of its emergency rating of 627 Amps.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 21:43	5	1Q17, 1Q16, 1Q07, 1Q20, 1Q21	78%

At 21:49, 27 kV network feeder 1Q01 de-energized. The problem was later identified as a defective primary cable section. Refer to row 6 in Table 1 for preliminary analysis. This resulted

in a sixth contingency in the LIC network. The demand on the feeder at the time it de-energized was 608 Amps. This demand was 75% of the emergency rating of 807 Amps.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 21:49	6	1Q01, 1Q16, 1Q17, 1Q07, 1Q20, 1Q21	78%

At 21:55, an attempt to restore feeder 1Q20 was unsuccessful. The problem was later identified as a transformer failure. Refer to row 7 in Table 1 for preliminary analysis.

At 21:55, an attempt to restore feeder 1Q01 was unsuccessful, and the LIC network remained in a sixth contingency.

At 23:21, feeder 1Q17 was restored to service upon completing repairs to the primary cable section. This reduced the LIC network contingency level to five.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/17/06 23:21	5	1Q01, 1Q16, 1Q07, 1Q20, 1Q21	67%

At 23:33, an attempt to restore feeder 1Q16 was unsuccessful. The problem was later identified as a damaged joint. Refer to row 8 in Table 1 for preliminary analysis. The LIC network contingency level remained at five.

Tuesday July 18, 2006

At 02:48, an attempt to restore feeder 1Q21 was unsuccessful. The problem was later identified as a damaged mechanical joint on the primary feeder cable. Refer to row 9 in Table 1 for preliminary analysis. The LIC network remained in a fifth contingency.

At 05:52, an attempt to restore feeder 1Q20 was unsuccessful. The problem was later identified as a damaged mechanical joint. Refer to row 10 in Table 1 for preliminary analysis. The LIC network remained in a fifth contingency.

At 06:08, radial feeder 1Q81 was restored to service. The LIC network remained in a fifth contingency, as the radial feeder 1Q81 has no impact on the network contingency level.

At 08:23, 27 kV network feeder 1Q02 de-energized. The problems were later determined to be a damaged primary cable section and a damaged joint. Refer to rows 11 and 12 in Table 1 for preliminary analysis. The demand on the feeder at the time it de-energized was 595 Amps. This demand was 79% of its emergency rating of 758 Amps. As a result the LIC network went into the sixth contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 08:23	6	1Q01, 1Q16, 1Q07 1Q02, 1Q20, 1Q21,	75%

At 09:33, 27 kV network feeder 1Q16 was restored to service. The LIC network contingency level was reduced to five.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 09:33	5	1Q01, 1Q02, 1Q07, 1Q20, 1Q21	77%

At 11:37, 27 kV network feeder 1Q07 was restored to service reducing the LIC network contingency to four.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 11:37	4	1Q01, 1Q02, 1Q20, 1Q21	78%

At 11:55, 27 kV network feeder 1Q17 de-energized. The LIC network went into the fifth contingency. The demand on the feeder at the time it de-energized was 527 Amps. This demand was 85% of its emergency rating.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 11:55	5	1Q01, 1Q02, 1Q17, 1Q20, 1Q21	78%

At 15:14, 27 kV network feeder 1Q18 de-energized. The problem was later identified as a damaged transformer. Refer to row 14 in Table 1 for preliminary information. The demand on the feeder at the time it de-energized was 493 Amps. This demand was 81% of its emergency rating of 606 Amps. The LIC network went into a sixth contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 1514	6	1Q01, 1Q02, 1Q17, 1Q18, 1Q20, 1Q21	76%

At 17:09, an attempt to restore the feeder 1Q21 was unsuccessful. The problem was later identified as a damaged joint. Refer to row 15 on Table 1 for preliminary information. The LIC network contingency level remained at six.

At 18:54, an attempt to restore feeder 1Q02 was unsuccessful. The problem was later identified as a damaged joint. Refer to row 16 on Table 1 for preliminary information. The LIC network contingency level remained at six.

At 20:05, 27 kV network feeder 1Q13 de-energized and the LIC network went into the seventh contingency. The problem was not related to primary cable or joint damage and is under investigation. The demand on the feeder at the time it de-energized was 435 Amps. This demand was 69% of its emergency rating of 630 Amps.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 20:05	7	1Q01, 1Q02, 1Q13, 1Q17, 1Q18, 1Q20, 1Q21	63%

At 20:33, two 27 kV network feeders 1Q12 and 1Q15 de-energized simultaneously. The problem was later determined to be a damaged primary cable section. Refer to row 18 in Table 1 for preliminary analysis. The demand on feeder 1Q12 at the time it de-energized was 375 Amps. This demand was 58% of its emergency rating of 641 Amps.

The problem on feeder 1Q15 was later determined to be a damaged transformer. Refer to row 19 in Table 1 for preliminary analysis. The demand on the feeder at the time it de-energized was 414 Amps. This demand was 45% of its emergency rating of 926 Amps. The LIC network went into a ninth contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 20:33	9	1Q01, 1Q02, 1Q12, 1Q13, 1Q15, 1Q17, 1Q18, 1Q20, 1Q21	63%

At 20:38, 27 kV network feeder 1Q16 de-energized. It was later determined that it went out of service due to a damaged high-voltage primary cable section and a damaged transformer. Refer to rows 20 and 21 in Table 1 for preliminary analysis. The demand on feeder 1Q16 at the time it de-energized was 575 Amps. This demand was 70% of its emergency rating of 824 Amps. The LIC network went into a 10th contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 20:38	10	1Q01, 1Q02, 1Q12, 1Q13, 1Q15, 1Q16, 1Q17, 1Q18,	63%

At 20:53, 27 kV feeder 1Q01 was restored to service. This reduced the LIC network contingency level to nine.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 20:53	9	1Q02, 1Q12, 1Q13, 1Q15, 1Q16 1Q17, 1Q18, 1Q20, 1Q21	56%

At 20:53, an attempt to restore feeder 1Q17 was unsuccessful. The problem was later identified as a damaged transformer. Refer to row 22 in Table 2 for preliminary analysis. The LIC network contingency remained at nine.

At 21:26, feeder 1Q13 was restored to service reducing the LIC network contingency to eight.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 21:26	8	1Q02, 1Q12, 1Q15, 1Q16 1Q17, 1Q18, 1Q20, 1Q21	55%

At 21:46, feeder 1Q18 was restored to service, and the LIC network contingency was reduced to seven.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 21:46	7	1Q02, 1Q12, 1Q15, 1Q16 1Q17, 1Q20, 1Q21	56%

At 21:50, an unsuccessful attempt to restore feeder 1Q16 was made. The problem was not a joint or cable damage and is under investigation. At the same time, feeder 1Q18 de-energized, and the LIC network contingency level increased to eight.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 21:50	8	1Q02, 1Q12, 1Q15, 1Q16 1Q17, 1Q18, 1Q20, 1Q21	55%

At 22:25, 27 kV network feeder 1Q19 de-energized. The demand on the feeder at the time it de-energized was 497 Amps. The problem was not a joint or cable damage and is under investigation. This demand was 75% of its emergency rating of 665 Amps. The LIC network contingency level increased to nine.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/18/06 22:25	9	1Q02, 1Q12, 1Q15, 1Q16 1Q17, 1Q18, 1Q19, 1Q20, 1Q21	52%

At 23:55, an attempt to restore feeder 1Q18 was unsuccessful. The problem was later identified as a damaged transformer. Refer to row 25 in Table 2 for preliminary analysis. The LIC network contingency level remained at nine.

Wednesday July 19, 2006

At 00:00, feeder 1Q19 was restored to service. The LIC network contingency was reduced to eight.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 00:00	8	1Q02, 1Q12, 1Q15, 1Q16 1Q17, 1Q18, 1Q20, 1Q21	47%

At 00:06, feeder 1Q19 de-energized. The problem was later identified to be a damaged transformer. Refer to row 26 in Table 2 for preliminary analysis. The demand on the feeder at the time it de-energized was 438 Amps. This demand was 66% of its emergency rating of 665 Amps. The LIC network went into a ninth contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 00:06	9	1Q02, 1Q12, 1Q15, 1Q16, 1Q17, 1Q18, 1Q19, 1Q20, 1Q21	45%

At 06:19, 27 kV network feeder 1Q21 was restored to service. The LIC network contingency was reduced to eight.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 06:19	8	1Q02, 1Q12, 1Q15, 1Q16 1Q17, 1Q18, 1Q19, 1Q20	44%

At 08:49, an attempt to restore network feeder 1Q17 was unsuccessful. The problem was later identified as a damaged joint. Refer to row 27 in Table 2 for preliminary analysis. The LIC network remained in an eighth contingency.

At 08:51, 27 kV network feeder 1Q14 de-energized. The problem was later identified as a damaged joint. Refer to row 28 in Table 2 for preliminary analysis. The demand on the feeder at the time it de-energized was at 462 Amps. This demand was 82% of its emergency rating of 829 Amps. The LIC network contingency increased to nine.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 08:51	9	1Q02, 1Q12, 1Q14, 1Q15, 1Q16, 1Q17, 1Q18, 1Q19, 1Q20	57%

At 11:33, 27 kV network feeder 1Q01 de-energized. The problem was later identified to be a damaged primary cable section. Refer to row 30 in Table 2 for preliminary analysis. The demand on the feeder was 654 Amps at the time it went out of service. This demand was 81% of its emergency rating of 807 Amps. The LIC network went into a 10th contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 11:33	10	1Q02, 1Q12, 1Q14, 1Q15, 1Q16, 1Q01, 1Q17, 1Q18,	54%

At 13:10, the 27 kV network feeder 1Q20 was restored to service. The LIC network contingency was reduced to nine.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 13:10	9	1Q02, 1Q12, 1Q14, 1Q15, 1Q16, 1Q01, 1Q17, 1Q18, 1Q19	49%

At 13:37, 27 kV network feeder 1Q12 was restored to service. The contingency in the LIC network was reduced to eight.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 13:37	8	1Q02, 1Q14, 1Q15, 1Q16 1Q01, 1Q17, 1Q18, 1Q19	50%

At 19:05, 27 kV network feeder 1Q02 was restored to service thereby reducing the contingency in the LIC network to seven.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 19:05	7	1Q01, 1Q14, 1Q15, 1Q16 1Q17, 1Q18, 1Q19	41%

At 20:41, 27 kV network feeder 1Q17 was restored to service. This reduced the LIC network contingency to six.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 20:41	6	1Q01, 1Q14, 1Q15 1Q16, 1Q18, 1Q19	42%

At 21:29, 27 kV network feeder 1Q17 de-energized. The problem was later isolated as a damaged transformer. Refer to row 33 in Table 2 for preliminary analysis. The demand on the feeder at the time it de-energized was 268 Amps. This demand was at 30% of its emergency rating of 904 Amps. The contingency in the LIC network increased to seven.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/19/06 21:29	7	1Q01, 1Q14, 1Q15, 1Q16 1Q17, 1Q18, 1Q19	43%

Thursday July 20, 2006

At 00:46, the LIC network contingency was reduced to six upon restoration of 27 kV network feeder 1Q18.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/20/06 00:46	6	1Q01, 1Q14, 1Q15, 1Q16, 1Q17, 1Q19	39%

At 04:33, 27 kV network feeder 1Q19 was restored, thereby reducing the LIC network contingency to five.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/20/06 04:33	5	1Q01, 1Q14, 1Q15, 1Q16, 1Q17	34%

At 06:36, 27 kV network feeder 1Q14 was restored, and the LIC network contingency was reduced to four.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/20/06 06:36	4	1Q01, 1Q15, 1Q16, 1Q17	37%

At 12:38, feeder 1Q17 was restored to service and the LIC network contingency was reduced to three.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/20/06 12:38	3	1Q01, 1Q15, 1Q16	52%

At 13:37, 27 kV network feeder 1Q07 de-energized. The problem was later identified to be a damaged primary cable section. Refer to row 36 in Table 2 for preliminary analysis. The demand on the feeder at this time it de-energized was 282 Amps. This demand was 41% of it summer emergency rating of 549 Amps. The LIC network went into a fourth contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/20/06 13:37	4	1Q01, 1Q07, 1Q15, 1Q16	52%

At 13:48, 27 kV network feeder 1Q15 was restored to service. The Long Island network contingency was reduced to three.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/20/06 13:48	3	1Q01, 1Q07, 1Q16	52%

Friday July 21, 2006

At 06:37, feeder 1Q07 was restored to service. The LIC network contingency was reduced to two.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/21/06 06:37	2	1Q01, 1Q16	43%

At 07:49, feeder 1Q16 was restored. The LIC network was reduced to first contingency.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/21/06 07:49	1	1Q01	52%

At 08:01, 27 kV network feeder 1Q01 was restored to service. All the 22 network feeders in the LIC network were restored.

Date & Time	LIC Network Contingency Level	27 kV Network feeders Out of Service	LIC Network Demand (% Max 395 MW)
07/21/06 08:01	0	None	53%

The 14 affected feeders operated at various elevated levels of contingency, but none of the feeders was loaded over its emergency rating upon de-energization. LIC network feeders had 39 faults that caused them to de-energize as shown in Tables 1 and 2 below. Twenty-one of these faults resulted while the feeder was in service; eight faults were identified during the low- and high-voltage testing phase prior to feeder restoration; and 10 faults occurred immediately after the feeder was restored to service.

As illustrated in the table below, 10 of the 39 problems were related to damaged transformers; eight of the 39 problems were related to damaged primary cable section, 12 of the 39 problems were isolated to damaged joints on the primary cable; one failure was related to termination; and the remaining eight problems are under investigation. The average age of 27 kV LIC network feeder cables with damages is 16 years, and the average age of damaged transformers in the LIC network is 31 years.

Premliminary Primary Feeder Analysis								
Row Number	Feeder	Outage	Problem Structure Type	Problem Structure No.	Problem Category	Manufacture Date	Age	Preliminary Cause of Problem
1	1Q17	De-energized Automatically	Manhole	11711	CABLE	1994	12	Sample Received Pending Analysis
2	1Q16	De-energized Automatically	Manhole	11711	CABLE	2000	6	No Failure Sample Received
3	1Q07	De-energized Automatically	Manhole	3881	JOINT	2006	0	Damage due to remake
4	1Q21	De-energized Automatically	Transformer Manhole	804	CABLE			No Failure Sample Received
5	1Q02	De-energized upon Restoration	Sidewalk	32E	OTHER	0		Not cable / joint failure
6	1Q01	De-energized Automatically	Manhole	820	CABLE	2000	6	No Failure Sample Received
7	1Q20	De-energized upon Restoration	Vault	7813	TRANSFORMER	1966	40	Transformer Failure: Analysis Pending
8	1Q16	De-energized upon Restoration	Manhole	1188	JOINT	1994	12	Analysis Pending: Paper tapes close to conductor brittle, outer layers found trace moisture
9	1Q21	De-energized upon Restoration	Manhole	14669	JOINT	1994	12	Analysis Pending: PILC cable had trace amounts of moisture and was well oiled.
10	1Q20	De-energized upon Restoration	Manhole	1699	JOINT	1992	14	Inherent Heat Shrink Problem; Interlayer Void
11	1Q02	De-energized Automatically	Manhole	820	CABLE	2005	1	External Damage from Secondary burnout
12	1Q02	De-energized Automatically	Manhole	14503	JOINT	2003	3	External Damage from Secondary burnout
13	1Q17	De-energized Automatically			OTHER			Not cable / joint failure
14	1Q18	De-energized Automatically	Submersible Vaultvault	9819	TRANSFORMER	1988	18	Transformer Failure: Analysis Pending
15	1Q21	De-energized upon Restoration	Manhole	2554	JOINT	1994	12	External Damage from Secondary burnout
16	1Q02	De-energized upon Restoration	Manhole	1889	JOINT	1994	12	Leaky seam or seal on shrink joints
17	1Q13	De-energized Automatically	Sidewalk	12E	OTHER			Not cable / joint failure
18	1Q12	De-energized Automatically	Transformer Manhole	838	CABLE	1984	22	No Failure Sample Received
19	1Q15	De-energized Automatically	Submersible Vaultvault	339	TRANSFORMER	1963	43	Transformer Failure: Analysis Pending
20	1Q16	De-energized Automatically	Submersible Vaultvault	479	TRANSFORMER	1964	42	Transformer Failure: Analysis Pending
21	1Q16	De-energized Automatically	Manhole	8405	CABLE	2002	4	External Damage From Secondary burnout

Table1.

Premliminary Primary Feeder Analysis								
Row Number	Feeder	Outage	Problem Structure Type	Problem Structure No.	Problem Category	Manufacture Date	Age	Preliminary Cause of Problem
22	1Q17	De-energized upon Restoration	Submersible Vaultault	7995	TRANSFORMER	1961	45	Transformer Failure: Analysis Pending
23	1Q18	De-energized Automatically	Sidewalk	22E	OTHER			Not cable / joint failure
24	1Q19	De-energized Automatically	Sidewalk	11E	OTHER			Not cable / joint failure
25	1Q18	De-energized upon Restoration	Submersible Vaultault	8807	TRANSFORMER	1988	18	Transformer Failure: Analysis Pending
26	1Q19	De-energized Automatically	Submersible Vaultault	624	TRANSFORMER	1969	37	Transformer Failure: Analysis Pending
27	1Q17	De-energized upon Restoration	Manhole	11730	JOINT	1990	16	Improper Oil Stop (Elastimold);Education
28	1Q14	De-energized Automatically	Manhole	908	JOINT			Insufficient Specimen Available to Perform Analysis
29	1Q12	De-energized upon Testing - Mod. Hipot	Sidewalk	21E	OTHER			Not cable / joint failure
30	1Q01	De-energized Automatically	Manhole	1892	CABLE	1947	59	External Damage From Defective duct
31	1Q15	De-energized upon Testing - Mod. Hipot	Manhole	1810	TERMINATION			No Failure Sample Received
32	1Q16	De-energized upon Testing - Ammeter Clear	Sidewalk	23E	OTHER	0		Not cable / joint failure
33	1Q17	De-energized Automatically	Submersible Vaultault	7981	TRANSFORMER	1972	34	Transformer Failure: Analysis Pending
34	1Q16	De-energized upon Testing - Ammeter Clear	Transformer Manhole	6285	TRANSFORMER	1995	11	Transformer Failure: Analysis Pending
35	1Q16	De-energized upon Testing - Ammeter Clear	Transformer Manhole	6531	TRANSFORMER	1993	13	Transformer Failure: Analysis Pending
36	1Q07	De-energized Automatically	Manhole	523	JOINT	1991	15	Improper Oil Stop (Elastimold);Education
37	1Q16	De-energized upon Testing - Mod. Hipot	Sidewalk	23E	OTHER			Not cable / joint failure
38	1Q01	De-energized upon Testing - Mod. Hipot	Manhole	1593	JOINT	2005	1	Dielectric Breakdown–XLP
39	1Q07	De-energized upon Testing - Mod. Hipot	P-B	783	JOINT	1992	14	Analysis Pending: Moisture and waxing found on the PILC cable.

Table 2.

The LIC network went into second contingency, the network design threshold, on Monday July 17, beginning at 15:50. In the days following, there were multiple levels of contingency involving 14 of the twenty-two 27 kV 1Q feeders in the LIC network. There were a total of fourteen 27 kV network feeders that went out of service for various durations.

The LIC network experienced two 10th, six 9th, six 8th, four 7th, five 6th, seven 5th, five 4th, two 3rd, two 2nd, and two 1st contingency levels of various duration between July 17 and July

23. Figure 6, illustrates the levels of contingency sustained by the LIC network through the course of this event.

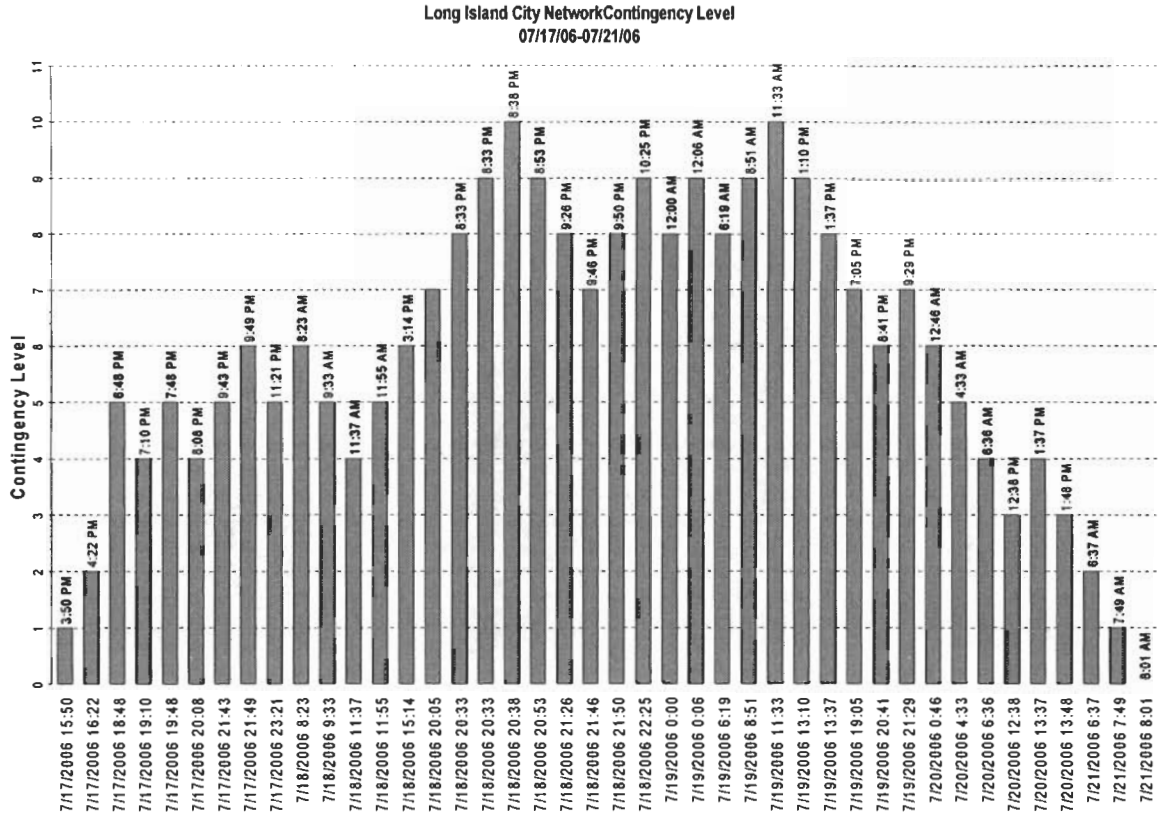

Figure 6 – LIC Network Contingency Level

The following Gantt chart, Figure 7, illustrates the various duration of feeder outages in the LIC network between 15:50 on Monday July 17 and 08:00 on Friday July 22.

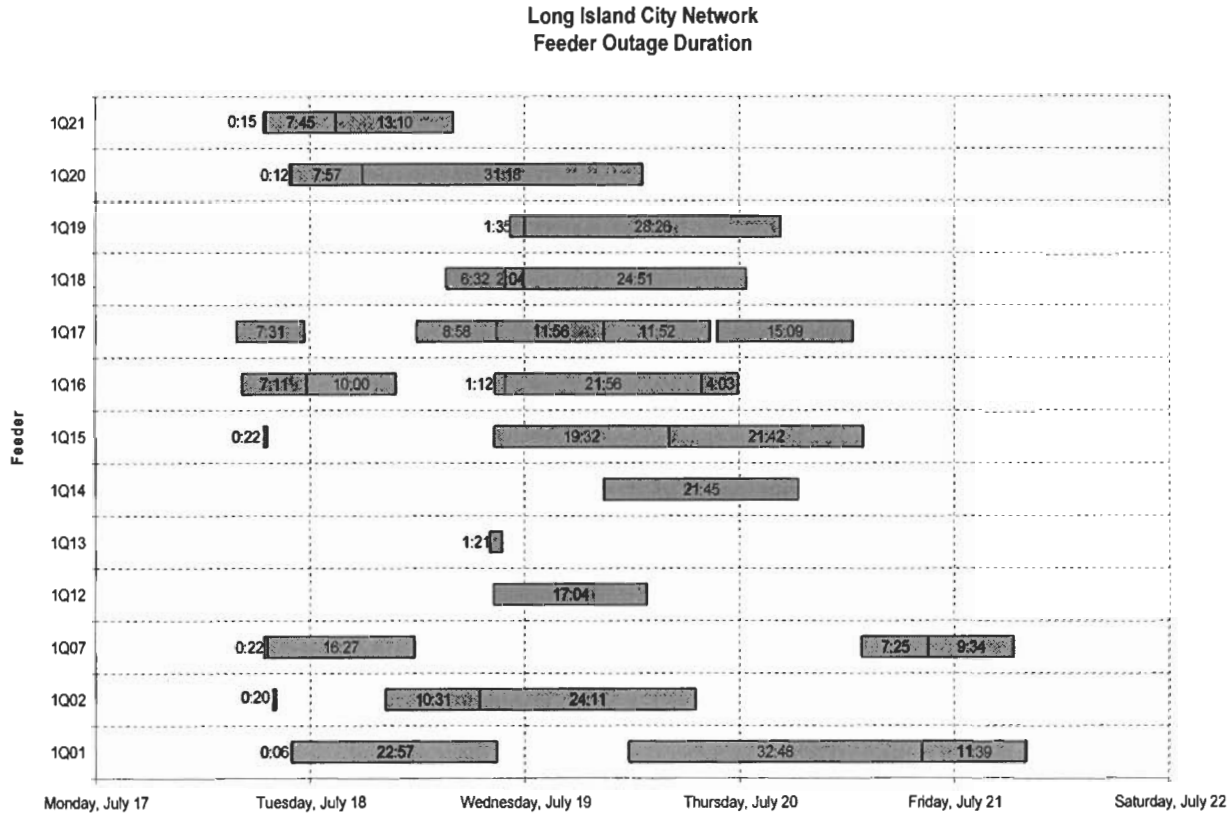

Figure 7 – LIC Network Feeder Outage Duration

Figure 8 shows the LIC network demand variation with the network contingencies experienced during the course of this event between 00:00 on Monday, July 17, and 09:00 on Friday, July 22.

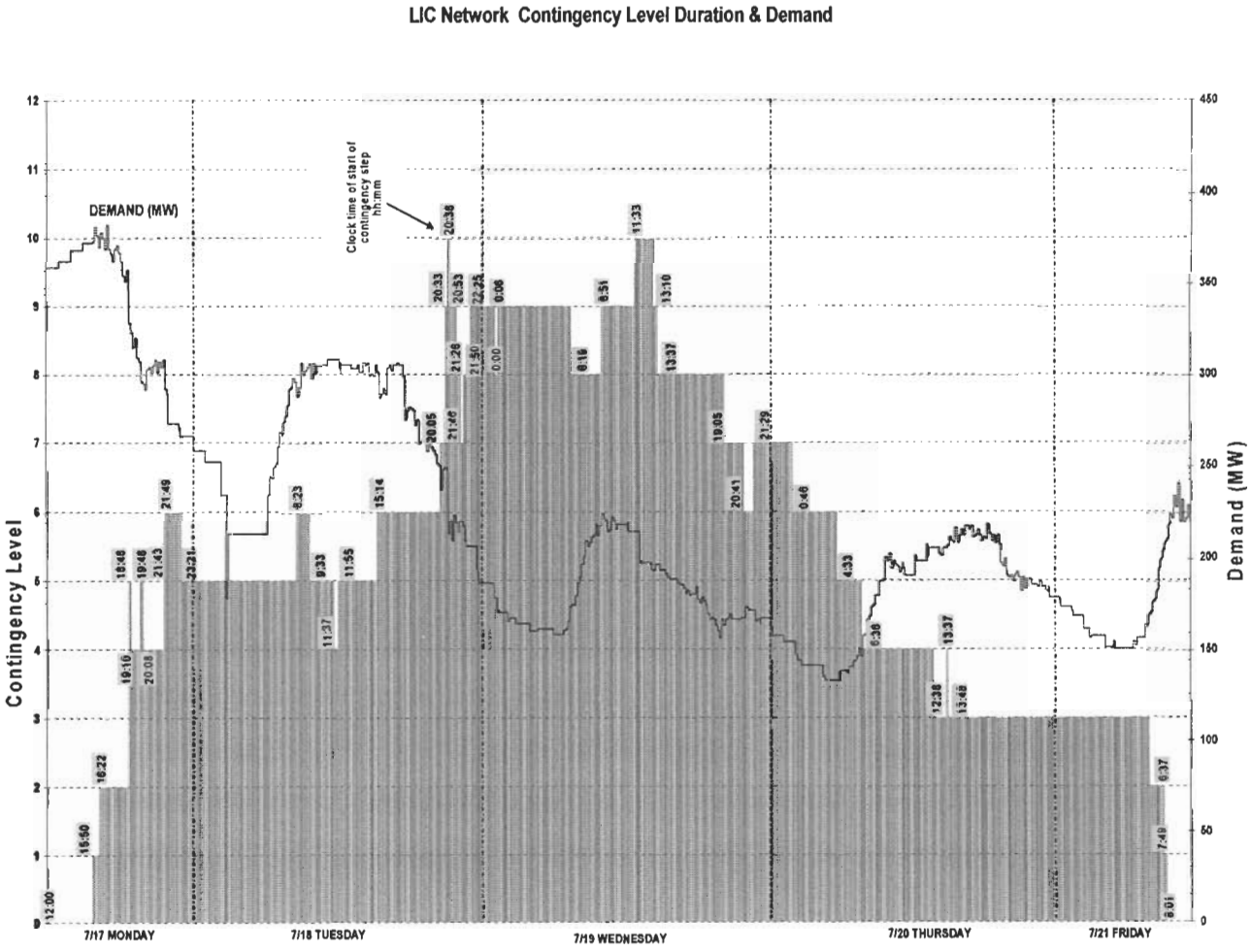

Figure 8 – LIC Network Contingency & Demand

c. Avoiding Network Shutdown

From approximately 15:14 to just prior to 20:00 on Tuesday, July 18, the LIC network remained in a sixth contingency. Between 20:05 and 20:38, the network moved from a sixth contingency to a 10^{th} contingency with the failure of an additional four primary feeders. Operators assessed the condition of the primary feeder system throughout the period and found no sustained emergency overloads on any primary feeders.

The LIC network demand had been decreasing for several hours from 250 MW at 20:00 to 209 MW at 21:00 and was forecast to continue to decrease. Demand reduction appeals to customers via mass media, police department outreach, and targeted requests of major customers appeared to be facilitating the reduction in network demand.

Operators continued to take actions relating to distribution system operation under contingency conditions, such as operating switches, replacing blown fuses, expediting primary feeder restoration, and locally cooling network transformers.

In addition, the decreasing temperature also indicated that the demand in the LIC network would continue to decrease. From 19:00 to 20:00, the air temperature had decreased three degrees, from 95 to 92 degrees, but from 20:00 to 21:00, it decreased by a full 10 degrees, to 82 degrees.

Within 15 minutes of reaching a 10th contingency, the network was brought to a ninth contingency with the restoration of feeder 1Q01 at 20:53. Repair work was progressing on feeders 1Q13 and 1Q18, and both feeders were scheduled to be returned to service by 22:00.

From 21:00 to 22:00, the temperature decreased another eight degrees, to 74 degrees, as rain storms moved into the area with the likelihood of further cooling occurring.

By 21:46, feeders 1Q13 and 1Q18 had been restored to service and the network was brought to a seventh contingency. From 22:00, the network demand continued to decrease, to 193 MW at 23:00 and 178 MW at 00:00.

Throughout the night and into the morning from 21:50 on July 18, to 11:33 on July 19, primary feeder repairs and restoration continued but additional feeder failures occurred such that the LIC network contingency level varied between seven and nine. During the night, the network demand continued to drop, reaching a low of 158 MW at 05:00 on July 19. Network demand increased into the day on July 19, reaching 214 MW at 11:33.

At 11:33 on July 19, the failure of feeder 1Q01 brought the network into a 10th contingency for a second time. At 214 MW, the LIC network demand was 94 MW lower than it had been at the same time on the previous day. The forecasted high temperature for July 19th was 14 degrees lower than the previous day's high of 85 degrees. There were no sustained overloads on any primary feeders.

Within approximately the next two hours, the network was brought to an eighth contingency with the restoration of feeders 1Q20 at 13:10 and 1Q12 at 13:37. The network demand did not increase beyond 215 MW and decreased to 193 MW at 13:00.

The network was brought to a seventh contingency at 19:05 with the restoration of feeder 1Q02. Feeder restoration continued throughout the evening into the night, and the network contingency level progressively decreased, reaching a fourth contingency by the early morning on July 20 with the restoration of feeder 1Q14 at 06:36. The network was brought to within its design threshold of second contingency by 06:37 on July 21 with the restoration of feeder 1Q07.

d. Identifying Customers without Electric Service

The determination of customer outages in a network system is dependent on customer calls. The inherent superior reliability of the network system, when compared to overhead systems, is that there are many possible paths for electricity to take to supply the customer. As a result, on the network system, while we know that a certain feeder or transformer is out of service, we do not necessarily know that any customers are out unless they tell us, and generally no customers are out of service. In the case of an open circuit in the low-voltage secondary grid, our systems cannot tell us an individual customer is out of service because the supply may still be energized. As customers call, service requests are generated in the Emergency Control System (ECS) to identify where a problem may exist in the secondary grid. The Con Edison customer outage system then aggregates and displays the total number of customers interrupted based on these service requests.

Customer calls to our toll-free number, 1-800-75-CONED, originate from all parts of our service territory. The automated menu provided to callers at the start of the call is designed to give

priority to emergency calls. After making the initial language selection (English or Spanish), customers are offered the following option:

> *"To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1.... "*
>
> If "1" is pressed, the customer is given the option to report either a gas or electric emergency.

When a storm or system event occurs, the automated system provides a special message to inform callers about the nature and location of the event, and to direct customers who are currently experiencing service problems to use the self-service option or speak to a representative to report individual outages, wires down, trees on wires, and other hazardous conditions.

When a customer calls to report an outage or electric problem, a service request is created in the ECS. The request contains the customer's name, location, date and time of the call and a code to identify the nature of the problem. All requests are classified into many sub-categories with two basic groupings to indicate outage and non-outage types in order to prioritize the response.

Initial customer counts are determined by the service request type. Requests that are established as No Light (individual no-light call - NL), No Light Area (jobs indicating areas without lights - NLA) and Side Off (individuals with only partial service - SO) are considered outage jobs. Other non-outage problems, such as Low Voltage (LV), Smoking Manhole (SMH) or Wire Burning

(WBR), will indicate zero customers out when created. All outage jobs have customer counts associated with them while non-outage jobs do not have any customers associated with them.

All requests, also referred to as jobs, are routed to the Regional Electric Control Centers (RECC). When a job is created in ECS, several events occur. First, the system checks to make sure the job is not a duplicate of work already in the system. If a duplicate job does exist, the customer outage count indicator on the original job is updated and a notification is sent to the appropriate RECC advising that the customer outages associated with that job have increased. In case the same customer calls again and the job status in ECS is open (i.e. the problem has not been addressed), the customer outage call count indicator on the original job does not increase.

Special automated messages were utilized and updated throughout the course of the event (refer to Appendix A - Special Messages Text and Timeline). As the event progressed, the automated messages were periodically updated to give the callers the most up-to-date information. Customers were requested to call back for all non-emergency related issues.

Figure 9 illustrates the cumulative number of customers who called to report an electric emergency received from LIC network customers during the course of this event.

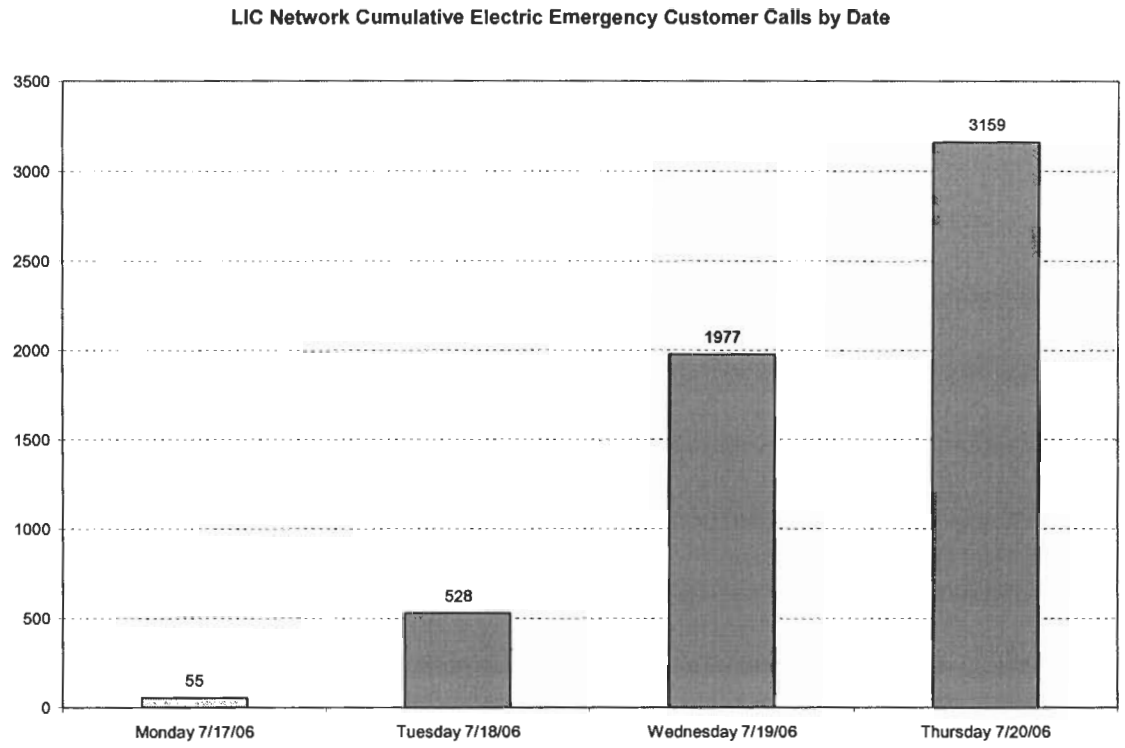

Figure 9: LIC Network Cumulative Electric Emergency Customer Calls by Date

Customer call activity (traffic patterns, review of recorded customer calls, the number of service requests or jobs issued) during the event indicates that the call volume increased after media attention and requests made by the media for customers to call us. Con Edison Call Centers received a total of 69,038 customer calls where customers indicated they had an electric emergency between July 17 and July 21. It's important to note that this represents calls from our entire service territory and areas of Westchester experienced outages due to storms during the period. Of these customer calls, 5,034 (7%) of the calls were abandoned, which means the customer hung up before speaking to a representative.

In a radial-supplied area, the ECS system also checks the feeder database, identifies the associated transformer and feeder, and updates the ticket with that information. In network-supplied areas, the ticket is updated with the proper network designation. The customer outage count associated with each job can also change based on the following criteria:

- If the job is in a network-supplied area, the initial customer outage count will be "1." The customer outage count can be increased by an operator in the control center. The outage count can also change when an operator combines multiple jobs into a single or "lead" job. This determination is usually made by the operator reviewing the map of the area where the outages are occurring, or from field verification.
- If the job is in a radial area, ECS has rules that associate service requests to common transformers and feeders to determine if they are out of service. This entry can also be manually changed by an operator to reflect actual conditions found in the field.
- If the job is initially created as a non-outage job, the operator can manually make a customer count entry if conditions indicate customers were affected.
- An operator can decrease the customer outage count by using the partial restoration function. A partial restoration indicates the portion of customers restored on that service request. A service request may have multiple partial restorations noted. The customer outage count is decreased each time a partial restoration is noted.

Figure 10 reflects the number of LIC network customer outages between Monday, July 17, and Thursday, July 20, based on outage related electric emergency customer calls recorded by ECS.

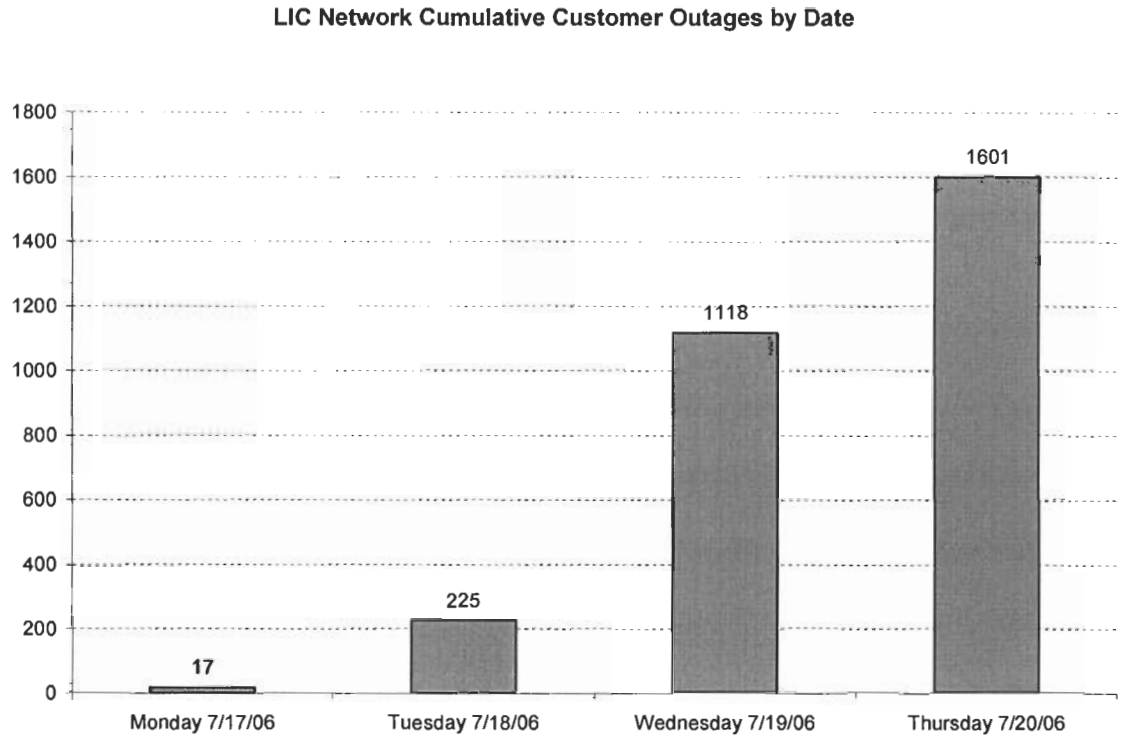

Figure 10: LIC Cumulative Customer Outages by Date

As observed in Figures 9 and 10, the number of electric emergency customer calls received at the end of the day does not equate to the number of customer outages due to the following reasons:

- Not all electric emergency customer calls are outage jobs (Non-outage jobs do not have any customer outages associated with them.)
- If multiple calls are received from the same customer on the same job and the job status is open, the customer outage count on the original job does not increase in proportion to the calls received.

Additional reports of area outages were received from the New York City Police and Fire Departments. Based upon the observations of Con Edison employees and other reports during

Wednesday night and Thursday, Con Edison realized that the outage was affecting more customers than previously estimated based on calls.

Con Edison focused its attention on a section of the network described by 62 Mains and Service plates (M&S plates or geographic maps of sections of the network). Thursday night, July 20, employees were dispatched to patrol these areas and annotate on the M&S plates the buildings that had no power. A public appeal was made to customers who had power to leave their lights on in order to aid in the assessment of customer outages.

By Friday morning, July 21, an area of the network described by 54 M&S plates had been surveyed.

All of the customers who were out of service or had partial service were manually counted and the counts aggregated. The number of customer outages was compiled on a spreadsheet that was updated every night after the survey. Based on this process, the customer outage total for the affected area was estimated to be approximately 25,000 customers. Surveys continued on subsequent nights to confirm outages and service restorations.

e. Restoring Customers

As a result of field surveys, by Friday we had confirmed that approximately 25,000 customers were out of service, and we developed and implemented a restoration plan. The outage area was divided into three zones to expedite the restoration process. The northern section of the network was designated Zone 2, the central section of the network designated Zone 1, and the southern section of the network was designated Zone 3. The Zone 1 and Zone 3 restorations were coordinated from the company's Astoria facility, and the restoration of Zone 2 was coordinated from the company's College Point facility.

The restoration progress within zones was further divided by M&S plates. The plates were categorized by customer outages into lead and adjacent plates. Zone 1 was grouped by 17 M&S plates, with 8,446 estimated customer outages. Zone 2 was grouped by 27 M&S plates with 10,049 customer outages. Zone 3 was grouped by 18 M&S plates with 6,570 customer outages. Figure 11 illustrates the tracking of the outage area in the LIC network by M&S Plates. Restoration was prioritized by targeting M&S plates that had the greatest numbers of customers interrupted, affording the opportunity to restore the greatest number of customers in the least amount of time.

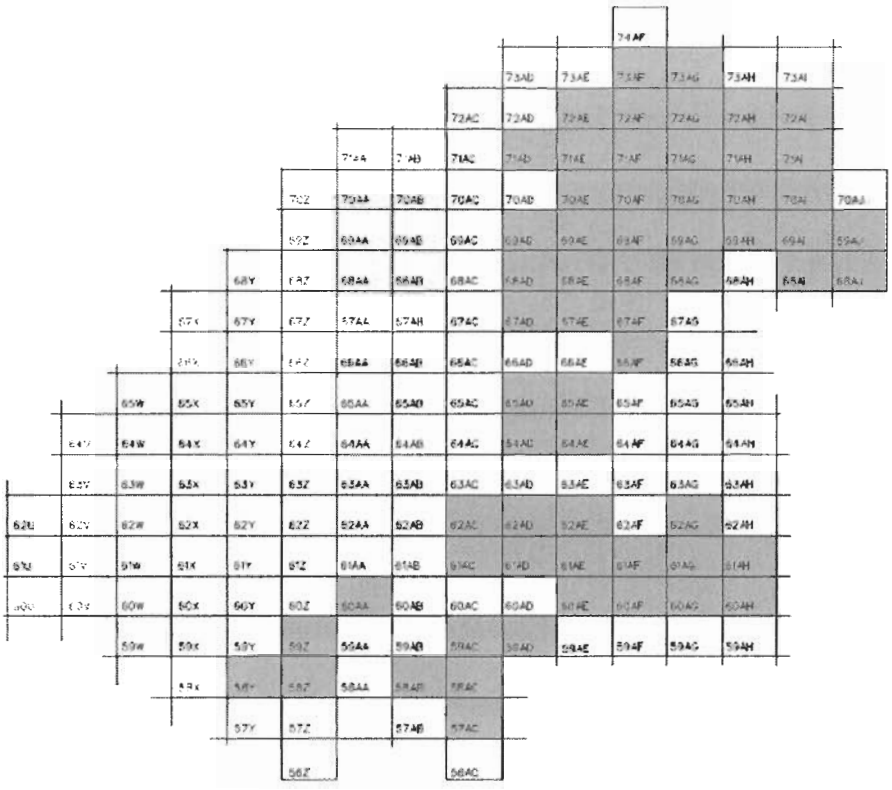

Figure 11: Graphical Display of LIC Network Depicting Affected Areas

Unlike an overhead system where damage can be assessed visually by observing downed wires, transformers and poles, assessment of the condition of an underground network system is more difficult because there is no simple way to know the status of the components. Inspection of manholes can diagnose problems with cables and splices contained within the given structure, but some of the secondary system problems were in the underground secondary cables between manholes. Problems in cables between manholes also need to be identified and addressed. In addition, the restoration process often involves pumping liquids out of underground structures in order for crews to gain access. Until all damage assessment is completed, the full extent of the repairs and the time necessary to restore customers to service is unknown.

As problems with the underground components were evaluated, sections of secondary cable that were known to have failed were cut away from the rest of the secondary system. Aboveground cable sections known as "shunts" were installed as connections to bypass sections of secondary cable that were known to be defective. As the restoration process continued, a computerized voice response unit called customers who were believed to be restored to confirm that they in fact had been restored.

Figure 12 below represents the restoration progress beginning Friday, July 21, 2006. All customers were restored by Wednesday, July 25, at 03:06.

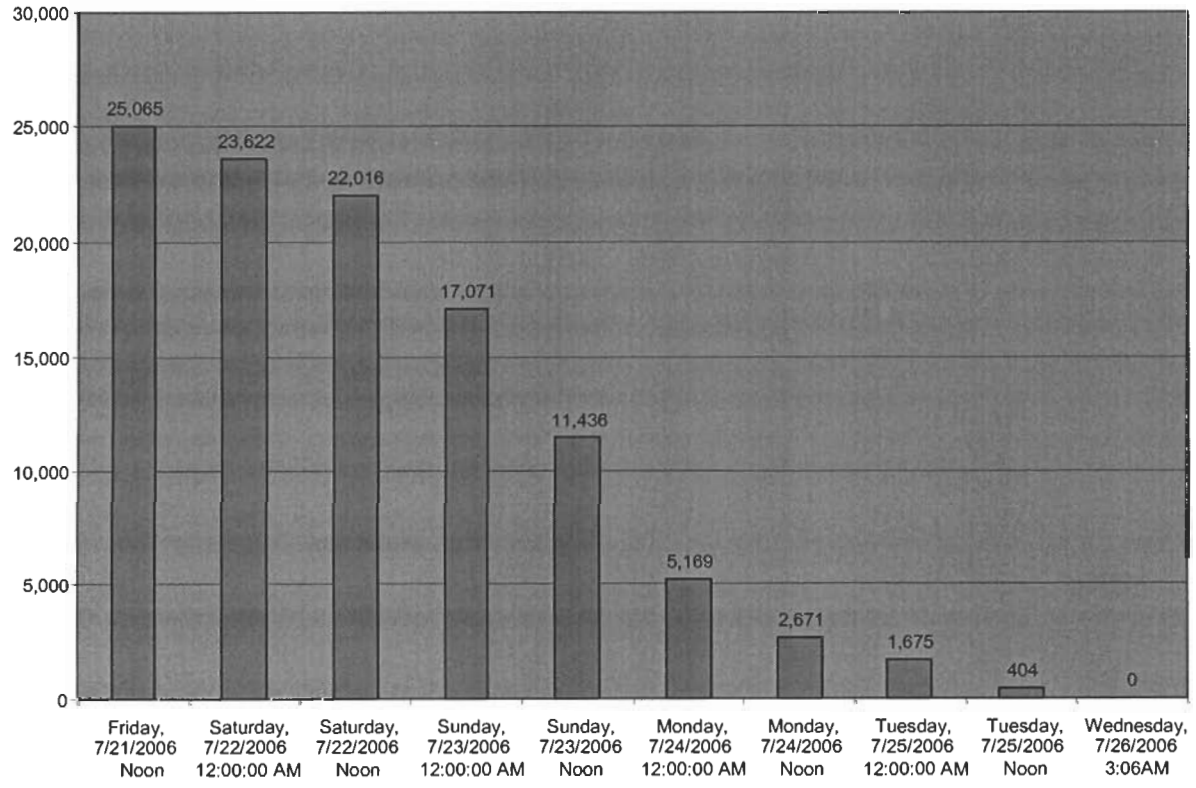

Figure 12: Display of Customer Outage by Date

From Monday, July 17, to Friday, July 21, there were a total of 91 manhole events in LIC network – two manhole explosions and 16 manhole fires, as shown in Figure 13, and 73 smoking manholes, as shown in Figure 14.

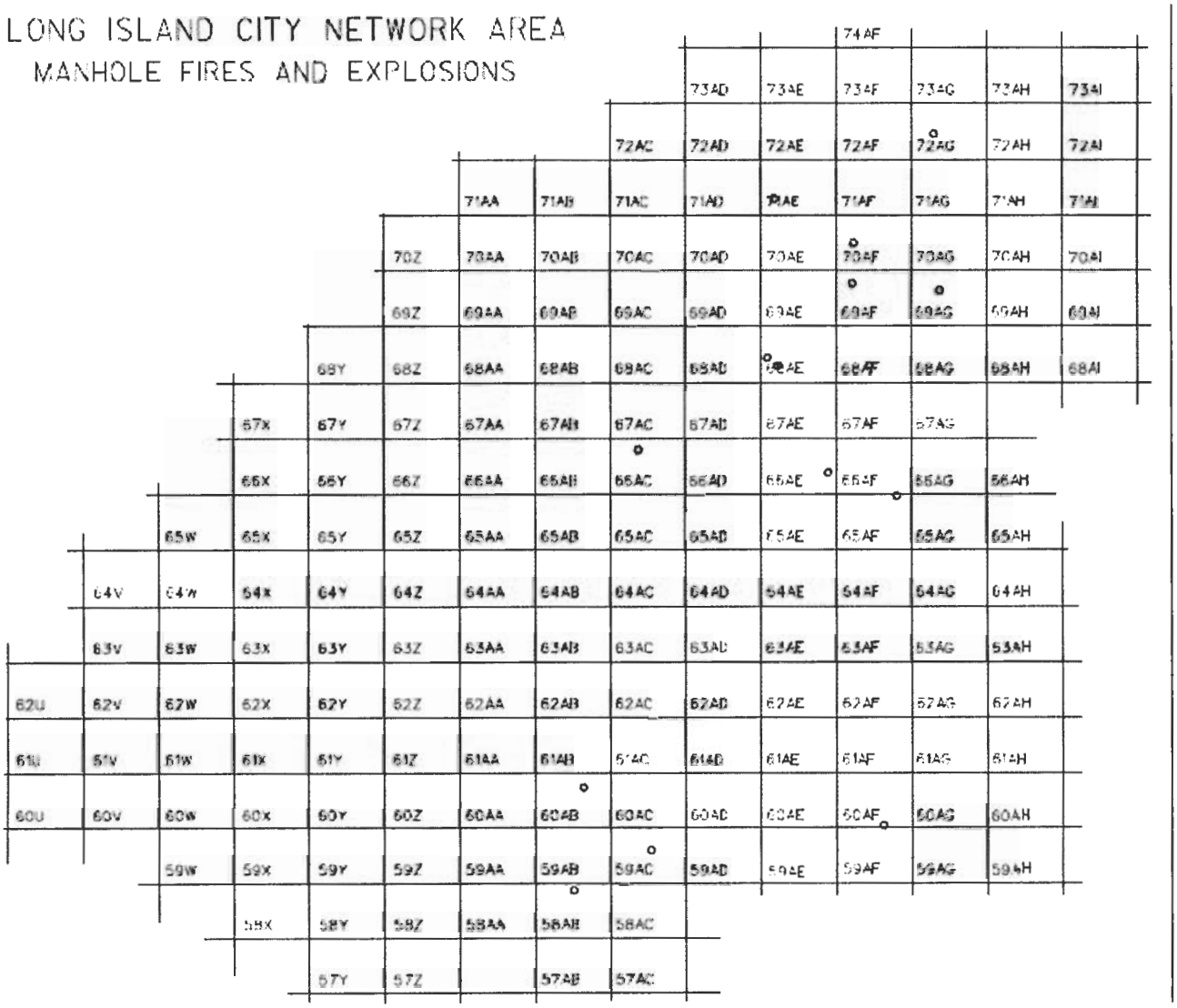

Figure 13: Figure Depicting Locations of Manhole Fires and Explosions in LIC Network

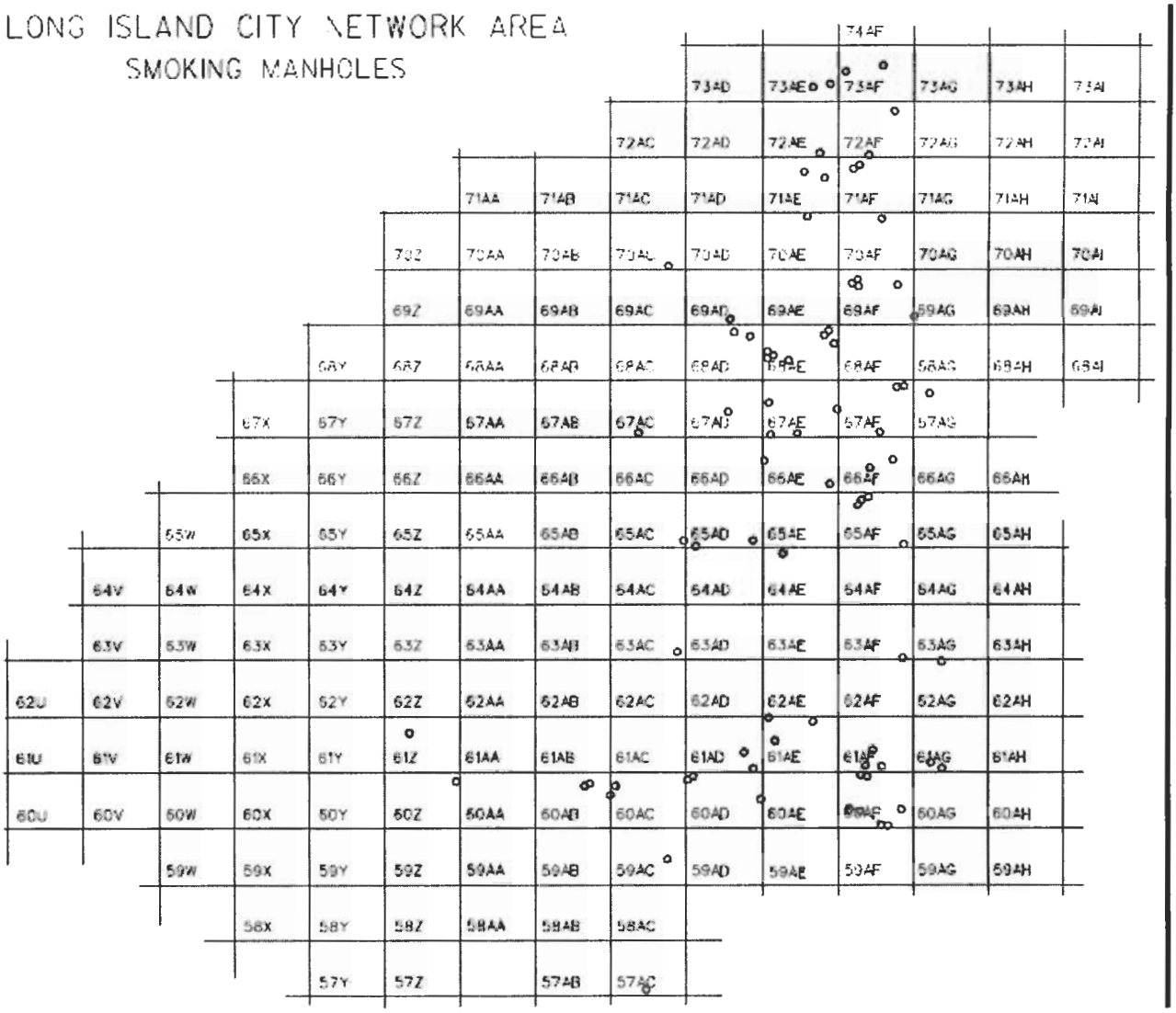

Figure 14: Figure Depicting Locations of Smoking Manholes in LIC Network

4. COMMUNICATIONS

a. EMERGENCY RESPONSE

Con Edison personnel monitor the electric, gas, and steam infrastructure 24 hours a day, 365 days a year at control centers located throughout the company's service territory. Whenever the system peak demand is expected to be greater than 10,500 MW, the System Operations department declares an Extreme Weather Criteria. In preparation for such demand, the following actions are taken:

- No primary feeders may be removed for scheduled work so that the primary distribution system has the maximum capacity available.
- All feeders that are out of service are returned to service as quickly as possible, which also maximizes primary distribution system capacity.

When the calculated extended weather forecast indicates hourly wet/dry bulb average temperatures greater than 80 degrees Fahrenheit for three consecutive hours, for a period of two or more consecutive weekdays, the following actions are taken:

- The Distribution Engineering Command Post is activated and acts as a centralized coordination center to monitor system conditions, provide engineering support, coordinate response with regional control centers, and provide periodic updates.
- The control centers and Distribution Engineering Command Post are placed under Incident Command Structure (ICS).
- The Call Center is staffed to handle increased call volumes.

- There is additional staffing of field personnel, such as substation operators, switching personnel, field operators, splicers, supervisors, and other groups participating in repairs and restoration.

During a major corporate emergency, such as the LIC network outage, Con Edison escalates the ICS structure by expanding the Distribution Engineering Command Post and ultimately mobilizing a Corporate Emergency Response Center (CERC) and Field Operation Center.

The ICS structure behind CERC activation supports and supplements the control centers by providing:

- Strategic management of an emergency incident from a central location
- Coordination of Con Edison's Regional Control Centers and the Emergency Field Operation Control Center for information and decision making
- Coordination of company forces, including Environmental Health & Safety (EH&S) Customer Operations, Public Affairs, and Logistics
- Coordination with outside agencies, including NYCOEM, NYPD, FDNY, and the PSC
- Coordination of crewing needs from all company areas (such as Brooklyn/Queens, Staten Island, Bronx/Westchester, and Manhattan)
- Coordination of external crewing resources, including outside contractors, mutual aid from other utilities, and mobile generator-related personnel.

Figure 15, below, provides an overview of the ICS staffing at CERC.

Incident Command Structure

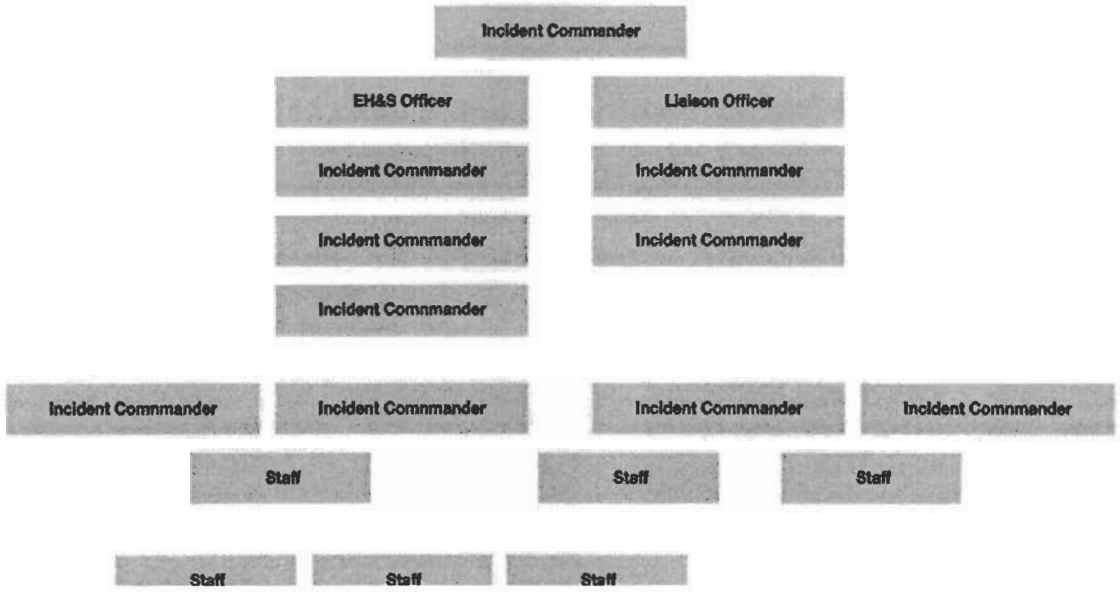

Figure 15: Illustrative Incident Command Structure (ICS)

Figure 16, below, provides an overview of the field operations structure.

Field Operations

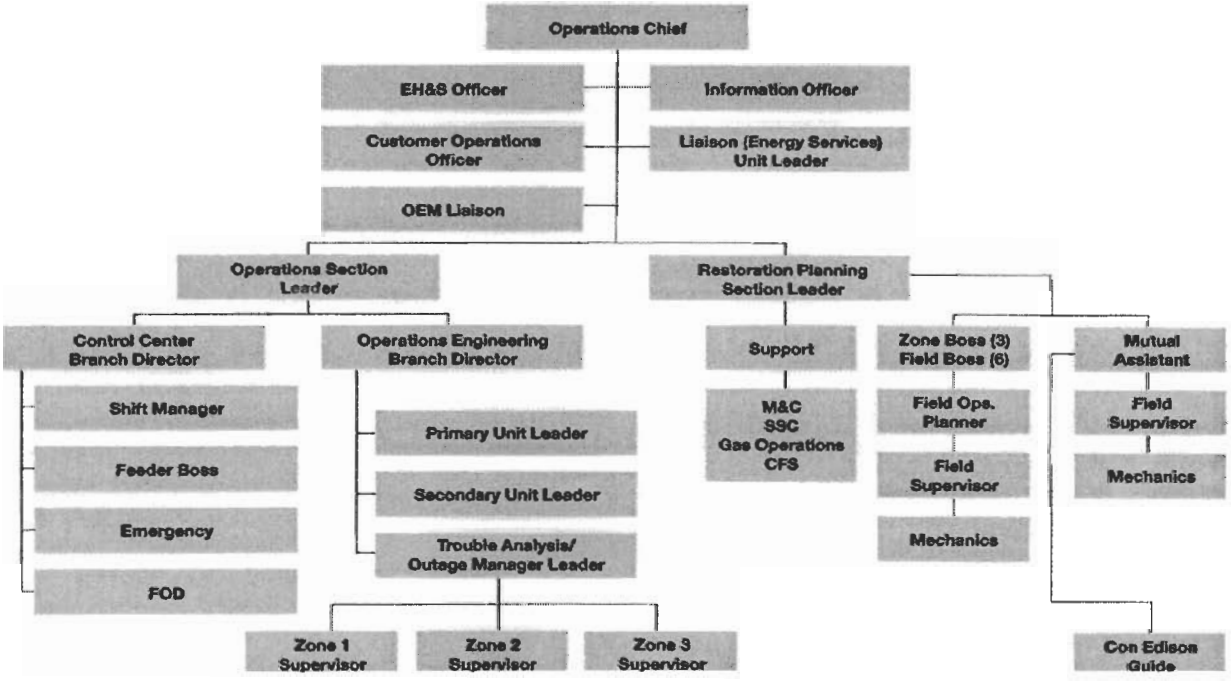

Figure 16: Illustrative Field Operations Structure

Since the forecasted demand for Monday, July 17, 2006, was 12,630 MW, and the forecasted temperature criteria were met, the Distribution Engineering Command Post was mobilized on Sunday, July 16. On Monday, July 17, the Brooklyn/Queens control center increased staffing and fully mobilized the Emergency Management Center.

Highlights of the staffing response to the LIC network outage include:

- Increased staffing as early as July 13 for system preparation prior to the forecasted heat and storm events
- Mobilization of the Distribution Engineering Command Post on Sunday, July 16, to support the various Control Centers throughout Con Edison's service territory
- Immediate field force and support staff escalation after second contingency reached at 16:23 on Monday, July 17
- Expanded CERC and Field Operation Center, which follow the ICS, on Thursday, July 20, at 09:28
- A significant increase in staffing from Monday, July 17, through Tuesday, July 25, in response to escalating feeder failures and secondary repair requirements
- An extended emergency restoration of the secondary (120/208V) network that ultimately directed the resources of over 2,000 personnel to the restoration of service to the LIC network
- Assistance from other utilities was also requested to supplement this effort. It should be noted that the unique nature of Con Edison's underground network system limited the amount of assistance that could respond to our needs.

Various resources supported field personnel and expedited system restoration in several ways:

- Energy Services called sensitive customers such as hospitals, nursing homes, and pumping stations to notify them of system concerns and request reduction of demand from large customers such as Rikers Island, DEP, and CitiCorp. (See Emergency Management System log in the Appendix.)
- Customer Operations contacted customers with life-sustaining equipment, responded to customer calls for support, and distributed ice. (See Emergency Management System log in the Appendix.)
- Logistics provided support to help address customer needs on location and to help mitigate the impact of the outage's duration on Con Edison customers.
- Emergency generator crews dispatched, connected, and operated mobile generators to meet large-customer requirements and provide temporary power to sections of the secondary system.
- CERC personnel directed resources.
- Mutual assistance crews from other utilities joined the restoration effort.

A special team, described in a later section, will address the ongoing LIC network recovery.

Coordination with Government Agencies

During the LIC network outage, Con Edison maintained close coordination with the NYCOEM, the NYPD, FDNY, the PSC, and other agencies. Con Edison sent representatives to the NYCOEM offices, and personnel from NYCOEM and NYPD worked in the company's

Distribution Engineering Command Post, Regional Control Centers, and CERC. This facilitated responses to requests where assistance from city agencies was required, such as:

- Assistance in demand reduction by city facilities such as schools, housing authority complexes, wastewater treatment plant, Rikers Island correctional facility, and transit facilities
- Assistance in customer appeals for demand reduction
- Escorts for crews and equipment to reach affected areas
- Assistance in prevention of damage to underground facilities due to digging

In addition, the PSC was provided with electronic updates and sent representatives to Con Edison's CERC.

b. PUBLIC OUTREACH

In addition to the CERC mechanism for communicating with NYCOEM, NYPD, FDNY, and PSC, Con Edison communicated with customers, the public, elected officials, and the news media. These outreach methods included:

- Customer Call Centers and Energy Service Representatives
- Con Edison-issued press releases to the news media
- Con Edison responses to media inquiries, including interviews
- Press conferences and tours of facilities
- Announcements on our Web site
- Emergency centers located within the Long Island City area

- Emergency announcements using handouts
- Emergency announcements with the assistance of police vehicles equipped to make public announcements by driving through neighborhoods.

Starting Monday evening, July 17, Con Edison began employing these methods to keep our customers and the press informed. The following list describes the chronology of steps that were taken:

Monday, July 17

- Beginning at 19:30, Customer Operations called critical customers, including those using Life-Sustaining Equipment (LSE), about voltage reduction.
- Distribution Engineering Command Post representative provided update to PSC representative on system events, including LIC network feeder outages.
- Press office issued press release urging customers in northwest Queens to curtail energy use, and fielded approximately 200 media calls about heat wave and outage updates.
- Call Center posted the same message for customers calling in and asked customers to report any problems with their electricity service. Con Edison indicated that voltage reduction should have no impact on service and offered customers the option to report electric service problems.
- Emergency Management initiated conference calls with NYCOEM to advise them of feeder problems in Queens and impact on major customers such as La Guardia Airport, Rikers Island, Bowery Bay Wastewater Plant, and MTA. Conference calls were scheduled and held with NYCOEM senior management every few hours.

- Energy Services contacted Port Authority regarding La Guardia Airport, and spoke to NYPD about Rikers Island and to MTA about subway service impact.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- NYCOEM personnel reported to Con Edison regional control center.

Tuesday, July 18

- Press Office issued two press releases urging customers in northwest Queens to curtail energy use and reporting approximately 500 customers out of service in Queens; fielded approximately 300 calls.
- Call Center continued conservation message.
- Customer Operations called LSE customers again.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- Emergency Management held scheduled conference calls with NYCOEM senior management every few hours.
- Company representative reported to NYCOEM's Emergency Operation Center (EOC), 111 Water Street, Brooklyn.
- NYCOEM and NYPD personnel maintained a presence at Distribution Engineering Command Post to work with Con Edison Emergency Management personnel.
- Emergency Management requested NYPD to use speaker vehicles in specific areas to request residents to stop using non-essential appliances.

- NYCOEM conference call held to discuss possibility of shutting down the network, placing generators at Rikers Island and Bowery Bay; and asking MTA and New York City Housing Authority to reduce demand.
- Energy Services contacted all large/sensitive customers in the network and asked for all non-essential usage to be curtailed.
- Public Affairs contacted elected officials

Wednesday, July 19

- Press Office issued three press releases aimed at Queens customers indicating dry ice locations and reporting approximately 1,600 customers out of service; fielded about 350 media calls.
- Customer Outreach established a center in the neighborhoods to distribute dry ice, provided guidance on submitting claims, recorded individual outage information, and offered general assistance. They also delivered dry ice to senior residences and several large apartment buildings, and coordinated activities with the Red Cross.
- Energy Services provided generators to Rikers Island and worked with NYCDEP's Bowery Bay Wastewater Treatment Plant to curtail electric consumption.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- NYCOEM and NYPD personnel maintained presence at the Distribution Engineering Command Post to work with Con Edison Emergency Management personnel.
- At the request of Emergency Management, NYPD continued to use speaker vehicles in specific areas requesting residents to stop using non-essential appliances.

- Call Center continued their energy conservation message for Queens.
- Public Affairs continued to update elected officials.

Thursday, July 20

- Press office issued three additional appeals for energy conservation and a press release asking customers to leave a light on if they have power so field crews can better assess the extent of the outage; outage number provided was 1,700; fielded approximately 400 media calls.
- Media Relations communicated to media that customers without power should call 1-800-75-CONED.
- Customer Operations continued to provide customer assistance at one field location: Ditmars Blvd. and Steinway St..
- Customer Operations asked NYPD to make house calls to customers who were on life sustaining equipment, but who had not responded to calls.
- Call Center continued to provide energy conservation message and accept outage calls.
- Emergency Management stayed in contact with NYCOEM and NYPD at CERC, communicating significant system changes as they occurred.
- Energy Services provided an additional generator to DEP Bowery Bay Plant.
- Public Affairs continued to update local elected officials and arranged for generators at specific locations.

Friday, July 21

- Press Office continued public appeal for conservation through press releases and announced the size of the outage had been underestimated. They also provided a new estimate of 25,000 customers out of service based on the previous night's field survey; claims information, customer assistance locations in affected neighborhoods, and urged customers to call if they did not have power.
- Call Center carried new outage number and continued to ask customers to report outages.
- Customer Operations continued to provide customer assistance at two field locations, Ditmars and Steinway, and 65th Street and 37th Avenue.
- Public Affairs continued to update local elected officials and provided claims information and ice drop locations to elected officials and local community groups.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred and a new estimate of 25,000 customers out of service.
- NYCOEM and NYPD personnel maintained presence at CERC to work with Emergency Management personnel.
- Company sent representatives to the NYCOEM command bus at the NYPD staging area in Astoria Park.

Saturday, July 22

- Press conference with Kevin Burke at the Learning Center in Astoria outlined escalation of feeder outages; restoration efforts, including difficulties posed by thunderstorm; urged customers to call if they did not have power; asked for continued

energy conservation; and announced that most customers should be restored by Sunday, but some would continue without power.

- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- NYCOEM and NYPD personnel maintained presence at CERC to work with Emergency Management personnel.
- Company sent representative to the NYCOEM command bus at the NYPD staging area in Astoria Park.
- Press office continued to update media.
- Call Center continued to ask customers to report outages.
- Customer Operations continued to provide customer assistance at two field locations, Ditmars and Steinway, and 65th Street and 37th Avenue.
- Public Affairs continued to update local elected officials and arranges for generators at specific locations.

Sunday, July 23

- Press conference with Kevin Burke at 4 Irving Place and press tour of CERC – reiterated request for customers to call if they did not have power restored. Outlined continued restoration effort.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- NYCOEM and NYPD personnel maintained presence at CERC to work with Emergency Management personnel.

- Company maintained presence at the NYCOEM command bus at the NYPD staging area in Astoria Park.
- Press office continued to update media – approximately 20,000 customers restored and provided claims information and customer service locations in Queens; fielded approximately 350 media calls.
- Call Center continued to ask customers to report outages.
- Customer Operations continued to provide customer assistance at five field locations, Ditmars and Steinway; 65th and 37th; PS2, 75-10 21st Avenue; 46th Street and Skillman Avenue; and an HRA location at 45-22 32nd Place.
- Public Affairs continued to update local elected officials

Monday, July 24

- Press office updated media on restoration efforts, continued to urge energy conservation and described flexible and expedited claims information posted on the Web; approximately 22,000 customers restored; urged customers to call if they don't have power; all information posted on the Web; provided customer assistance locations; fielded approximately 400 calls.
- Call Center continued to ask customers to report outages and included a special message for northwest Queens customers, telling them it is important that they speak to a representative.
- Customer Operations continued to provide customer assistance at five field locations, Ditmars and Steinway; 65th and 37th; PS2, 75-10 21st Avenue; 46th Street and Skillman Avenue; and an HRA location at 45-22 32nd Place.

- Public Affairs continued to update local elected officials and provided updated information on claims and ice locations to elected officials and community planning boards.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- NYCOEM and NYPD personnel maintained presence at CERC to work with Emergency Management personnel.
- Company remained present in the NYCOEM command bus at NYPD staging area in Astoria Park.

Tuesday, July 25

- Press office continued to provide information on claims and customer service field locations; urged customers without service to call; fielded approximately 300 calls.
- Customer Operations continued to provide customer assistance at five field locations, Ditmars and Steinway; 65th and 37th; PS2, 75-10 21st Avenue; 46th Street and Skillman Avenue; and an HRA location at 45-22 32nd Place.
- Public Affairs continued to update local elected officials.
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occurred.
- NYCOEM and NYPD personnel maintained presence at CERC to work with Emergency Management personnel.
- Company maintained presence in the NYCOEM command bus at NYPD staging area in Astoria Park.

Wednesday, July 26, 2006

- Press office issued press release describing restoration progress, and continued to urge customers without power to call; claims information provided with new direct phone number.
- Customer Operations continued to provide customer assistance at five field locations, Ditmars and Steinway; 65th and 37th; PS2, 75-10 21st Avenue; 46th Street and Skillman Avenue; and an HRA location at 45-22 32nd Place.
- Public Affairs continued to update local elected officials
- Emergency Management stayed in contact with NYCOEM and NYPD, communicating significant system changes as they occur.
- Company maintained presence in the NYCOEM command bus at NYPD staging area in Astoria Park.

d. Special Team Dedicated to Northwest Queens Recovery Effort

Con Edison has dedicated a special team to perform maintenance on the LIC network over the next few months to continue restoring the LIC network. Katherine Boden, a Con Edison vice president, will lead an LIC network rebuilding task force. The team will stabilize and rebuild the area's electrical system and enhance customer outreach. The team will test and inspect the electric system in Astoria, Sunnyside, Woodside, Long Island City, and Hunters Point. Components of the electrical system in those areas will be evaluated, and repaired or replaced, as necessary.

The team will establish two offices -- one in Astoria and another in Sunnyside/Woodside -- to direct engineering, logistics, operations, construction, customer operations, and customer outreach efforts.

5. Demand Reduction Measures

a. Emergency Generators

Con Edison utilizes mobile generators to respond to individual service emergencies, localized system distribution conditions, and for distribution demand relief purposes, to help maintain the reliability of our electric services and/or system.

Deployment of mobile generators supported LIC network restoration effort in a number of ways by providing:

- Area customer restoration (overhead pick-up)
- Support to isolated critical customers (Mt. Sinai Hospital, Rikers Island, etc.)
- Targeted area relief by picking up individual demand centers (Phipps Housing, etc.)
- Support/cautionary measures to the electric system (Rainey PURS Substation).

Con Edison's Central Field Services (CFS) group controls, maintains, and dispatches of all the company's heavy mobile equipment, including mobile generators, through a 24/7/365 operation center. CFS's responsibility includes maintaining vendor contact listings and equipment inventories for initial and rapid deployment.

Con Edison's various Control Centers have the ability to request emergency generators directly and/or to utilize Con Edison's Distribution Engineering Command Post to help coordinate this effort through CFS. The company has contractual agreements with several mobile generator vendors, including HO Penn/Caterpillar, General Electric, and Onsite Power, to expedite the dispatch of additional units that may be called for during a significant system emergency.

Depending upon the event, individual customers being connected to mobile generators could be those served by 4160 V, 265/460 V or 120/208 V services, and customers providing demand relief off the primary and/or secondary distribution system. In addition, Con Edison will, while transferring large customer demand from the network to mobile generators, also evaluate opportunities to isolate localized geographical areas to be transferred to a mobile-generation supply. In most cases, these responses complement a demand reduction on the system and allow the company to operate the system under or closer to design conditions even during exceptional-weather or demand-contingency events.

As part of the LIC network emergency, Con Edison began preparing and dispatching mobile generators on Monday, July 17. Customers provided with mobile generators included Rikers Island and the DEP Bowery Bay Wastewater Treatment plant. By Wednesday evening, Con Edison had approximately 16 generating units available for customer needs and was working with various vendors to secure additional units. By Sunday, 32 units were available, totaling 20 MW for customers' needs. At this point, Con Edison essentially had resolved the feeder problems, but was beginning to uncover substantial problems on the secondary system. Con Edison then began a two-pronged approach of continuing the dispatch and operation of generators for customers while starting to isolate portions of the overhead system to supply temporary power to as many customers as possible. The only effort in Con Edison history that rivaled this effort was our response to the World Trade Center incident in 2001, when we dispatched 92 mobile generators totaling 102 MW.

Figure 17: Deployment of mobile generators in response to LIC network customer outages

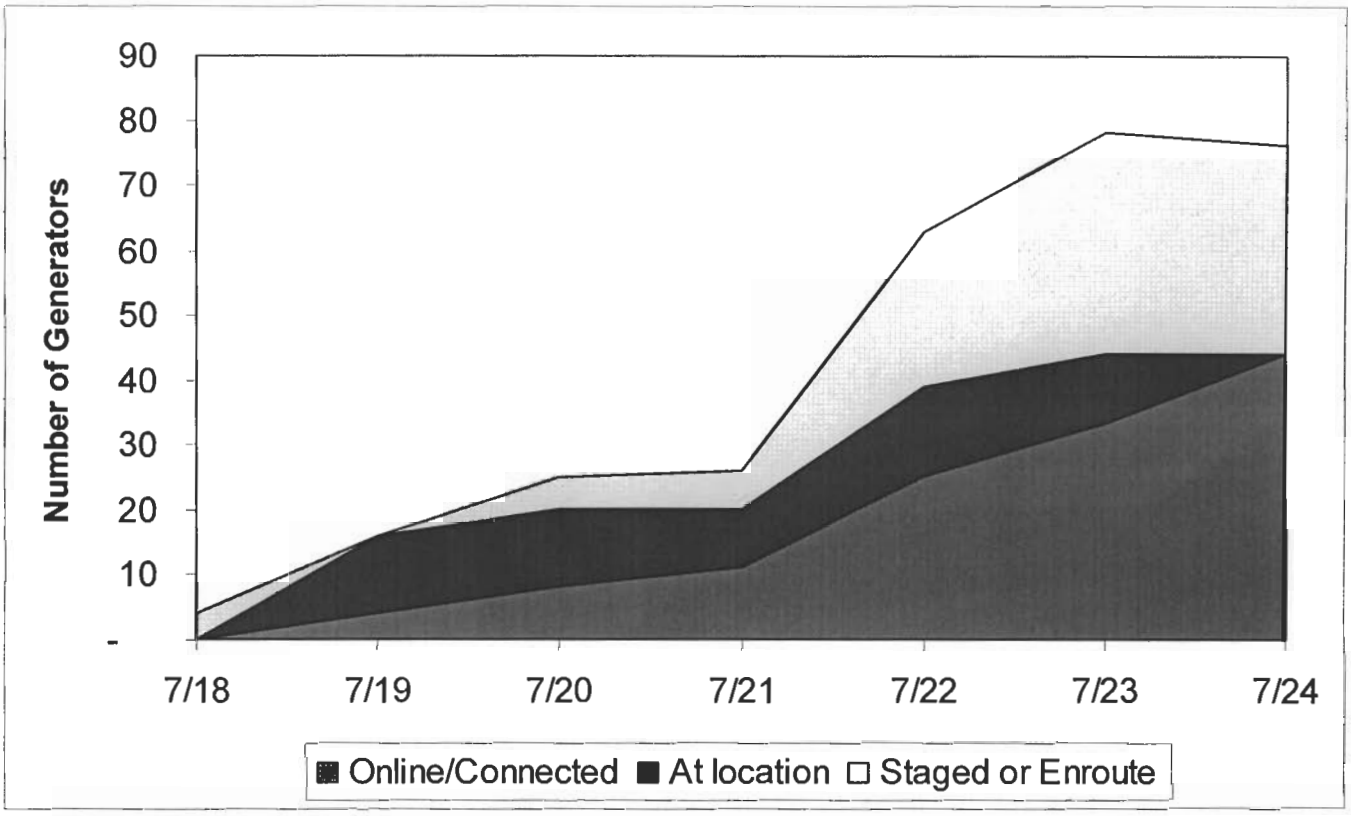

Figure 18: Number of Mobile Generators

b. Demand Response Programs

Con Edison has actively solicited customer participation in a variety of demand response programs to be used as tools to help maintain the reliability of the electric system, and in emergency situations. These programs encompass voluntary programs through tariffs, non-tariff, and outreach. The programs create a portfolio that gives both the NYISO and Con Edison flexibility to augment responses to energy situations within Con Edison's service territory as well as throughout New York State.

Our demand-response measures (sometimes referred to as demand management or demand response), in order of implementation are:

- Demand reduction at Con Edison facilities
- Public appeals to reduce electricity demand
- Distribution Demand Relief Program (DLRP) – Con Edison emergencies)
- Direct Load Control (DLC) Program
- Emergency Demand Response Program (EDRP) – (ISO emergencies)
- NYISO-issued Special Case Resources (SCR-ICAP)
- Customer demand reduction
- Direct customer appeals to reduce electric demand
- 8% voltage reduction

Con Edison used all forms of these demand management tools in response to the LIC network event. Table 3 shows the demand reductions estimated from the various demand response measures.

#	Load Management Resource	Estimated Demand Reduction (MW) 7/17 (Mon)	7/18 (Tue)	7/19 (Wed)	7/20 (Thu)
1	Voltage Reduction	19.9	16.0	11.6	11.3
2	Demand reduction				
	Company Facilities in LIC Network	1.7	1.7	1.7	1.7
	Customer Facilities	-	10.5	39.4	33.0
3	Emergency Demand Response (EDRP)				
	and Special Case Resources (SCR)	-	12.9	12.9	-
4	Distribution Load Relief Program (DLRP)	-	1.1	1.1	-
5	Direct Load Control (DLC)	0.6	0.6	0.6	0.6
	Maximum demand management	22.2	42.8	67.3	46.6

Table 3. Demand Reduction Methods and Estimated Results in LIC network

Figure 19 shows the actual electric usage for the LIC network from July 17 to July 21, including the impact of various demand reduction measures.

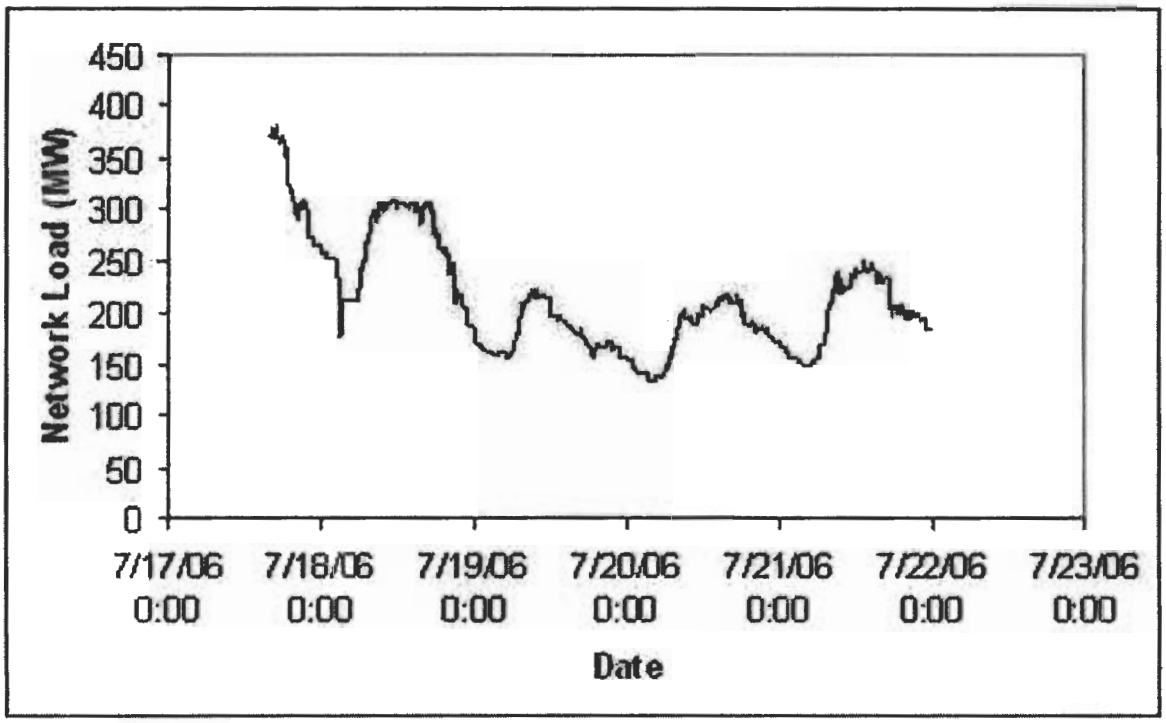

Figure 19: Electric Demand in LIC network

Voltage Reduction

During emergency situations, Con Edison will reduce voltage by 8% to help lower the electric usage on the network. Experience indicates this may result in a 5.2% actual reduction of electric usage on the system at any given time. The estimated voltage reduction values shown in table 3, display the effect of voltage reduction at the peak demand on the specified day.

Demand Reduction

Company Facilities in LIC Network

Con Edison facilities were directed to reduce non-essential demand on Tuesday, July 18, and Wednesday, July 19. Con Edison has a number of facilities in the LIC network and aggressively reduced demand at these facilities on Tuesday morning, including shutting down non-essential demand at the company's training facility, The Learning Center:

Company Facility	Response	Estimated Demand Reduction
Con Edison Learning Center	Shutdown Learning Center	0.7 MW
Astoria Gas Plant	Reduced all non-essential load	0.5 MW
Astoria Gen Plant	Placed equipment on internal Light & Power	0.5 MW

Table 4. Demand Reduction Methods and Estimated Demand Reductions at Con Edison Facilities

Customer Facilities

In addition to reducing energy consumption at Con Edison facilities within the affected area, company personnel actively pursued demand reduction and conservation efforts from large customers through direct appeals and from all customers using press releases, messages broadcast from police vehicles, and leaflets distributed by company personnel. Large customers are contacted directly because they are most likely to be impacted by feeder outages and because they provide a large amount of demand that can be removed from the system at once.

At the inception of the LIC network event, Monday evening, July 17, Energy Services personnel contacted large/sensitive customers located in the network. Con Edison maintains a database of large/sensitive customer account listings and contact information within a secure database, the Emergency Operating System (EMOPSYS). Many of these customers, such as hospitals and other large businesses, have their own emergency generators on site, and, in addition to simply reducing demand, may be able to shift demand to emergency generation.

In this instance, our contact efforts included notification of an 8% voltage reduction in addition to requesting that customers take steps to conserve energy by eliminating non-essential usage.

This customer outreach effort continued for much of the week. Daily calls were made to these same customers apprising them of the evolving status and re-affirming the request for energy conservation.

On Tuesday, July 18, and Wednesday, July 19, members of the Energy Services Department walked through specified areas in which we were experiencing secondary problems. They distributed flyers that asked customers to eliminate the use of all non-essential electric equipment. Through efforts that included customer phone calls, press releases, and in-field outreach, the network demand was significantly reduced from the peak that was experienced on Monday.

In response to our initial call for assistance, several customers switched to existing on-site emergency generation, including CitiCorp, the Bowery Bay Wastewater Treatment Plant, and the Triborough Bridge and Tunnel Authority.

In certain cases, Con Edison will supplement customers' on-site generation with additional mobile generators; this was the case at the DEP Bowery Bay Wastewater Treatment Plant and Rikers Island.

On Wednesday, as system conditions deteriorated during the daytime peak, calls were made to specific customers requesting that they curtail operations and take steps to eliminate all electrical usage. Customers responded by halting industrial operations, shortening office hours, in effect sending employees home. In addition, CitiCorp and MetLife decided to shut down on portions of Wednesday.

The table below displays an estimated overview of the large customers who responded to our request:

Customer	Response	Tue, 7/18 Request	Wed, 7/19 Request	Thu, 7/20 Request
CitiCorp	**Tue:** Ran on-site emergency generator & reduced general building load **Wed:** Sent staff home by 1PM **Thu:** Operated building load at 5MW; full power late afternoon	1.5 MW	6.5 MW	2.0 MW
MetLife	**Wed:** Sent staff home in afternoon **Thu:** Operated building at 1MW		2.5 MW	1.5 MW
NYC Transit Authority	**Wed:** Reduced train service in Queens		0.9	
Dept of Corrections (Rikers Island)	**Wed:** Ran on-site emergency generation to supply load **Thu:** Ran on-site emergency generation to supply load		18MW	18MW
NYC DEP (Bowery Bay Wastewater Treatment Plant)	**Tue:** Ran onsite emergency generators to power parts of plant **Wed:** Used onsite generators to power 65% of plant **Thu:** Operated at 100% with Con Ed supplied generation	5.0 MW	7.5 MW	7.5 MW
Port Authority (LaGuardia)	**Tue:** Inadvertent impact to one terminal reduced load **Wed:** Transferred load to another network Thu: Load remains on other network	4.0MW	4.0MW	4.0MW

Table 5. Estimated Customer Electric Usage Reduction

Con Edison annually solicits customers for retention as well as augmentation purposes for these programs. The NYISO estimates that in the Con Edison service territory there are 470 MW of demand reduction enrolled either through Con Edison or other providers. Con Edison also has approximately 90 MW of demand reduction enrolled in its DLRP program with approximately 6 MW controlled under a NYISO program.

Emergency Demand Response Program (EDRP) and Special Case Resources (SCR)

Con Edison facilitates these NYISO programs in our territory, which call upon customers to reduce demand during a NYISO called emergency. These programs require a day-ahead notification, which Con Edison provided to the NYISO on Monday, July 17, to help support the

system in the LIC network. The NYISO indicated to us after the event that it estimated a reduction of almost 13 MW in the LIC network.

Distribution Load Relief Program (DLRP)

This program works similar to the EDRP program but is sponsored by Con Edison and can be implemented in regions of Con Edison's system where needed.

Direct Load Control Program (DLC)

Con Edison operates a system-wide Central Air Conditioning Direct Demand Control Program in which a customer agrees to allow Con Edison to adjust the on-off cycles of their air-conditioner while the fan continues to operate. To date, Con Edison has installed more than 15,000 units in residential facilities capable of reducing demand by 19.0 MW and more than 4,000 thermostats in small businesses capable of reducing demand by 6.1 MW. Con Edison utilized this program to reduce customers' central air-conditioning demand and remove approximately 0.6MW off the LIC network.

6. NEXT STEPS

Con Edison continues to document what happened throughout the outage. The demand experienced by individual feeder cable components in the LIC network will be examined. Autopsies of feeder cables and joints to determine causes of failure will be conducted. Transformers that failed will be deconstructed to determine the causes of their failures. The demand experienced by low-voltage cables and the secondary grid will be modeled to determine the progression of customer outages.

Demand response, generator mobilization, and voltage reduction and their effects in the LIC network will also be evaluated.

The limitations of the customer outage tracking will be reviewed and a new approach to customer outage tracking will be implemented. This will include an examination of the call-in protocol.

A future report will encompass the analysis of various factors affecting the LIC network. This report will also reach conclusions and make recommendations to improve service to the public.

Appendix A - Special Messages Text and Timeline

1) At 19:30 on Monday, 7/17/06, because of the voltage reduction in the LIC network, customers were offered the following option after making the initial language selection (English/Spanish):

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

If "1" was pressed, the customer was given the option to report an electric outage, a gas leak, a steam emergency or other hazardous.

Callers who selected the electric emergency option heard the following ***special message***:

Special Message 1

> *We are currently experiencing an 8% voltage reduction in our Long Island City network area in Queens. Although this should have no impact on your service, we're asking anyone living within that area as follows: on the west, the East River / on the east, the Brooklyn Queens Expressway / on the north, Long Island Sound / and on the South, on Newtown Creek; To please cut back usage on all non-essential appliances wherever possible.*

Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition*. Because ***Special Message 1*** advised callers that the LIC voltage reduction should have no impact on their service, customers calling with outages would be likely to speak to a representative.

2) On 7/17/06, at 22:34, we implemented another ***special message*** to prioritize emergency callers and encourage customers with billing or credit issues to call back later due to overall increased call volume.

At the start of the call, all Con Edison callers heard this message after making the initial language selection (English/Spanish):

> ***Special Message 2***
> *As a result of severe weather, many of our customers are without service at this time. Priority is being given to callers without service. If you have a rotary phone and have a gas emergency, dial 1-800-350-9346: again that number is 1-800-350-9346. Otherwise we ask that you call us tomorrow.*

Special Message 2 was followed by:

To report an electric outage, a gas leak, a steam emergency or other hazardous condition ***press 1.***

Callers who pressed 1 heard:

> ***Special Message 1***
> *We are currently experiencing an 8% voltage reduction in our Long Island City network area in Queens. Although this should have no impact on your service, we're asking anyone living within that area as follows: on the west, the East River / on the east, the Brooklyn Queens Expressway / on the north, Long Island Sound / and on the South, Newtown Creek; To please cut back usage on all non-essential appliances wherever possible.*

These callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.* Because ***Special Message 1*** advised callers that the LIC voltage reduction should have no impact on their service, customers calling with outages would be likely to speak to a representative.

3) On 7/18/06, from 09:00 to 17:00, customers no longer heard ***special message 2***

Here's what callers heard after making the initial language selection (English/Spanish):

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

Callers who pressed 1 heard:

> **Special Message 1**
> *We are currently experiencing an 8% voltage reduction in our Long Island City network area in Queens. Although this should have no impact on your service, we're asking anyone living within that area as follows: on the west, the East River / on the east, the Brooklyn Queens Expressway / on the north, Long Island Sound / and on the South, Newtown Creek; To please cut back usage on all non-essential appliances wherever possible.*

Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.* Because ***Special Message 1*** advised callers that the LIC voltage reduction should have no impact on their service, customers calling with outages would be likely to speak to a representative.

4) On 7/18/06, starting at 20:46, all customers heard ***special message 2*** due to the storm. This message directed callers with billing and credit issues to call back the following day. This message remained in effect until 7/19/06 at 10:08.

Here's what callers heard after making the initial language selection (English/Spanish):

> ***Special Message 2***
> *As a result of severe weather, many of our customers are without service at this time. Priority is being given to callers without service. If you have a rotary phone and have a gas emergency, dial 1-800-350-9346: again that number is 1-800-350-9346. Otherwise we ask that you call us tomorrow.*

Special Message 2 was followed by:

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

Callers who pressed 1 heard:

> ***Special Message 1***
> *We are currently experiencing an 8% voltage reduction in our Long Island City network area in Queens. Although this should have no impact on your service, we're asking anyone living within that area as follows: on the west, the East River / on the east, the Brooklyn Queens Expressway / on the north, Long Island Sound / and on the South, Newtown Creek; To please cut back usage on all non-essential appliances wherever possible.*

These Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.* Because ***Special Message 1*** advised callers that the LIC voltage reduction should have no impact on their service, customers calling with outages would be likely to speak to a representative.

5) On 7/19/06, at 09:32, the electric emergency message was changed when more information became available regarding events, and special message 1 was replaced. After making the initial language selection (English/Spanish), callers heard:

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

Callers who pressed 1 heard:

> **Special Message 1A**
> *The damaging thunderstorms at the end of the heat wave interrupted electric service to as many as 25,000 customers in Westchester County. Public safety is our first priority. While we are assessing damage, our crews will be working to restore power to the largest number of customers in the shortest possible time.*

Please use our self-service options or speak to a representative to report individual outages, wires down, trees on wires, and other hazardous conditions.

The most damage is in the communities of Yonkers, Port Chester, Harrison, White Plains, Ardsley, Greenburgh, New Rochelle, and Scarsdale.

Customers in the Long Island City, Sunnyside, Woodside, Hunters Point and Astoria neighborhoods of Queens are requested to continue not using non-essential electrical appliances and equipment until problems on electrical cables can be resolved. Your cooperation will help ensure uninterrupted electric service.

The affected area in Queens is bounded by the East River on the west and north, the Brooklyn-Queens Expressway on the east and Newtown Creek on the south.

Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.*

For short periods during the day ***special message 2*** was again utilized to encourage billing and credit callers to call back the following business day.

6) On 7/19/06, at 18:20, the messaging was changed as follows to put emphasis on the Queens outage.

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

Callers who pressed 1 would have then heard:

Special Message 1B

Hundreds of Con Edison crews have been working to stabilize the electrical system in northwest Queens neighborhoods of Long Island City, Sunnyside, Woodside, Hunters Point, and Astoria. We appreciate the continued conservation efforts of our residential and commercial customers in these areas.

Con Edison crews are also working round the clock to restore service to customers who lost power during Tuesday night's violent storms. The most damage is in the Westchester County communities of Yonkers, Port Chester, Harrison, White Plains, Ardsley, Greenburgh, New Rochelle, and Scarsdale. Please follow the menu prompts to report problems with your lights, wires down, trees on wires or to follow-up on a previous report. We understand the frustration of people who are experiencing power outages and appreciate your patience.

Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.*

7) After making the initial language selection (English/Spanish), callers on 7/20/06 at 0900 hours heard:

> **Special Message 4**
> *Many of our customers are without service or are experiencing service problems due to the heat wave or the violent storms Tuesday night. Hundreds of Con Edison crews are working around the clock to stabilize the electrical system in northwest Queens and restore service to customers who lost power. Priority is given to callers with service problems. If you want to pay a bill or have a customer service, credit or billing question, please use our interactive self service options whenever possible. Thank you for your cooperation.*

Special Message 4 was followed by:

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

Callers who pressed 1 heard:

> **Special Message 1B**
> *Hundreds of Con Edison crews have been working to stabilize the electrical system in northwest Queens neighborhoods of Long Island City, Sunnyside, Woodside, Hunters Point and Astoria. We appreciate the continued conservation efforts of our residential and commercial customers in these areas.*
>
> *Con Edison crews are also working round the clock to restore service to customers who lost power during Tuesday night's violent storms. The most damage is in the Westchester County communities of Yonkers, Port Chester, Harrison, White Plains, Ardsley, Greenburgh, New Rochelle, and Scarsdale. Please follow the menu prompts to report problems with your lights, wires down, trees on wires or to follow-up on a previous report. We understand the frustration of people who are experiencing power outages and appreciate your patience.*

Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.*

8) 7/21/06 at 14:33 callers would have heard the following after making their initial language selection (English/Spanish):

To report an electric outage, a gas leak, a steam emergency or other hazardous condition press 1....

Callers who pressed 1 heard:

Special Message 1C

Based on Thursday night's visual inspection of the damage to cables in northwest Queens and block-by-block surveys, Con Edison estimates that 25,000 customers in northwest Queens area are without power. This affects the following neighborhoods, Long Island City, Sunnyside, Woodside, Hunters Point and Astoria. Previous estimates were based on the number of customers who had called the company to say they were without electricity. Con Edison will be working around the clock, through the weekend, to restore all customers. We regret the inconvenience this has caused you. We thank you for your patience.

Callers were then given the option to ***press 1*** *to report an electric service problem, wires down or other electric condition.*

Appendix B - Emergency Operating System (EMOPSYS)

Customer contacted by Energy Services regarding system status and to request reduction usage.

ASTORIA GAS PLANT

ASTORIA GENERATING PLANT

MEMORIAL SLOAN KETTERING

FRESH DIRECT

THE KOREAN PRESBYTERIAN CHURCH

SUNNYSIDE DAY CARE

SILVERCUP STUDIOS

EAST COAST 6 LLC

UNITED NATIONS FEDERAL CREDIT

AVALON RIVERVIEW

ST MARY`S SR CTR - COOLING CTR

SPITI HOUSING DEVLP – COOLING

BOY'S CLUB OF QUEENS – COOLING

CEPHALOS CEPHALONIAN – COOLING

L I C SENIOR HOUSING

BOHEMIAN HALL - COOLING CENTER

BLANCA SANCHEZ FOR

ASTORIA COMMUNITY SR – COOLING

TEX DEVELOPMENT

BOARD OF EDUCATION (various facilities)

NYC SCHOOL CONSTRUCTION

QUEENS VOCATIONAL HIGH SCHOOL

LA GUARDIA COLLEGE

NYC FIRE DEPARTMENT

PUBLIC SCHOOL 234

NYC POLICE DEPT

DEPT OF CORR. RIKERS

DEPT OF DESIGN AND CNST

DEP - BOWERY BAY WPCP

JAMAICA BAY WATER POLLUTION CONTROL

FAA

PORT AUTH OF NYNJ LAGUARDIA AIRPORT (1Q)

NYS QUEENSBORO CORR

ASTORIA HOUSES

QUEENSBRIDGE HOUSES

WOODSIDE HOUSES

WOODSIDE HOUSES - COOLING CENTER

RAVENSWOOD HOUSES

RAVENSWOOD HOUSES – COOLING CENTER

AMTRAK 3655

AMTRAK 3702

LIRR-ARCH STREET YARD

TBTA (QUEENS MIDTOWN TUNNEL)

REGAL HEIGHTS HEALTH CARE CENTER

EAGLE ELECTRIC MFG

NY ENVELOPE CORP

STANDARD MOTOR PROD

MOUNT SINAI HOSPITAL

NORTH QUEENSVIEW

JOINT QUEENSVIEW HSG

STEINWAY AND SONS

PRICECOSTCO, INC.

MET LIFE

BROOKS BROTHERS BUILDING

GARDEN SPIRES ASSOC LP ENT

KERNS MANUFACTURING

ASTORIA STUDIOS LTD

33-00 PARTNERS LLC

BELLATLANTIC 31120

CITICORP AT COURT

PLAXALL INC

INDUSTRY CITY ASSOCIATES

BRIDGEDALE LLC

CELTIC HOLDINGS LLC

ALLIED EXTRUDERS INC

ROADRUNNER LLC

AMERICAN CABLEVISION

BULOVA WATCH CO INC

CELTIC HOLDINGS LLC

ALLIED EXTRUDERS INC

ROADRUNNER LLC

AMERICAN CABLEVISION

BULOVA WATCH CO INC

EDWARDS FOOD 192

FAA AT ASTORIA YARD

NATIONAL WHOLESALE LIQUIDATOR

PATHMARK STORES, INC

HOME DEPOT 1255

QUEENS BLVD EXTENDED

ASTORIA ENERGY, LLC (500 MW GEN. PLANT)

THE FRANKLIN NURSING

CON EDISON TRAINING CENTR

ASTORIA GENERATING COMPANY LP

RAVENSWOOD SENIOR CENTER