MFR 040/8/43

#### MEMORANDUM FOR THE RECORD

Type of event: Interview of Consolidated Edison Company of New York officials

Date: February 26, 2004

Special Access Issues: None

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Team Number: 8

Location: Con Edison, 4 Irving Place, New York, NY

Participants - Non-Commission: Louis L. Rana, P.E., Senior Vice President, Electric

Operations; Frances A. Resheske, Senior Vice President, Public Affairs; John H. Banks,

Vice President, Government Relations; Katherine L. Boden, Chief Engineer, Distribution

Engineering

Participants - Commission: Emily Walker, Mark Bittinger

Commission staff spoke with the senior members of the Con Edison Team who worked on 9-11 recovery operations in order to clarify the actions of Con Edison related to the closure and reopening of the financial market in response to the terrorist attacks of September 11, 2001 (9/11) as well as their overall operations on 9/11.

Con Edison is the major electrical carrier for the New York area. They cover 660 square miles, 8.8 million people, over 3 million customers, and include Westchester County as well as New York City. And everything is underground in NYC, there are no overhead power lines.

On September 11, 2001, Kathy Boden saw the first plane hit on a television screen and called Louis Rana who immediately set up their control center are Irving Place. They had been through the 1993 bombing and they had faced many crises so they had an emergency plan and crisis management team ready to perform. When the second plane hit, they knew it was not an accident so they mobilized for a major emergency. The corporate emergency response center on Floor 19 of the Con Ed building sent people to the World Trade Center site. They had coordinated and worked with OEM of NYC as well as Police and Fire on many occasions and had a set procedure for cooperation. During this catastrophe there was "unbelievable cooperation," including needed access to the Holland Tunnel for nighttime deliveries of GE generators. The NYPD had a direct line to Con Ed's shift manager. And the shift manager has the authority to dispatch a work crew as required. The Chairman of Con Ed, Eugene R. McGrath, had 3 meetings a day and was always looking forward as to what they would do next.

The World Trade Center area was divided into network areas: Park Place Network, World Trade Center Network, Battery Park Network, Cortlandt Network, Fulton Network, and Bowling Green Network. The main power was supplied from Brooklyn.

There were two substations in WTC 7 building, serving the twin towers, and one substation by the South Street Seaport. A total of eight 13 kW feeders were located at the WTC.

Timeline on 9/11/2001:

08:46 a.m. Two WTC open/auto (O/A) 13 kW feeders went off

09:02 a.m. Two additional WTC open/auto (O/A) 13 kW went off

09:52 a.m. Four additional open/auto (O/A) 13 kW feeders went off

10:28 a.m. Status:

Cortlandt 8 of 15 feeders were off Battery Park City 6 of 8 feeders were off Bowling Green 6 of 16 feeders were off Park Place 1 of 12 feeders were off

Con Ed can lose any 2 feeders, and not lose a network grid. It is very expensive to make this investment and have such a robust system. The NYSE was located in the Bowling Green network. Since all 8 feeders were lost prior to WTC South tower falling, it was possible the lights had gone out before. However, the Port Authority controlled the equipment in the towers and Con Ed did not know exactly what happened inside the towers. They did have maps of the towers and were prepared to help the Port Authority in the event they were needed. As the towers fell, they were destroying subservice station suppliers. By 10:30 a.m. the only place totally out of electricity was the WTC complex.

The evacuation of lower Manhattan reduced the load requirements and helped as the electricity was lost following the collapse. Many building owners turned off the HVAC when they left the buildings so the bad air would not circulate which also saved electricity. Had this attack occurred in hotter summer weather, with the increased use of air conditioning, things could have been worse. Con Ed reps who were in WTC 7 said that there was a fire, but they did not think the building would collapse. Since Con Ed had two substations in the WTC 7, this was an important point for the future electricity.

However, at 4:15 p.m., Con Ed employee Fred Sims had spoken to the fire department and told Con Ed headquarters that they thought WTC 7 would collapse. The fire department asked Con Ed to shut down the power to WTC 7 which they did. This cut off power to Park Place, Battery Park City and Cortlandt. They were able to shut this down remotely from the West End Avenue. Con Ed decided, however to leave the transmission line open to service Fulton Street because they were not positive the building would fall and it was servicing Beekman Hospital which they thought may have been needed to care for casualties. When WTC 7 finally did collapsed at 5:20 p.m., it severed cables and collapsed the other two substations.

Con Ed had a contingency plan to recover from losing one substation, but they did not have a plan for losing both. They had to severe the line coming into the area from Brooklyn. In order to close the cable, they had to use freeze the oil that was used as an insulator and brought in liquid nitrogen tanks to do the freezing. This took significant

coordination with OEM as it was a dangerous substance. They froze the oil and since water pipes were next to the electrical cables, they had to put warming devices on the water pipes to keep them from freezing. It was quite a difficult and dangerous job, as major assets were moved into the city to assist with response and recovery operations, and it needed to be coordinated.

In addition, Con Ed had to supply generators for the power for ongoing urban search and rescue operations. They had 6 generators nearby, but GE had 70 in New Jersey which helped.

In 8 days, everything that had lost power was restored. They had to put in 36 miles of cable which was a huge effort given everything else that was going on.

#### Networks restored:

Battery Park City (North) 9/13/01, 11:11 a.m. Park Place Network: 9/14/01, 11:28 a.m. Fulton Network 9/17/01, 3:30 a.m. Battery Park City (South) 9/18/01, 1:35 p.m. Cortlandt 9/19/01, 3:51 a.m.

Since the area was still off limits, the usage was low except for search efforts. Many other utilities volunteered to help Con Ed, but they had adequate staff from nearby as well as some contract employees who had to go through a physical and be trained to use the personal protective equipment, including a face mask and self-contained breathing apparatus. Con Ed required these respirators or the employee couldn't work at the site. This was based on internal Con Ed environmental requirements that came from disasters in the past which propelled the internal procedures.

The sequencing of power restoration and the planning was conducted by Con Ed engineers. They had to coordinate with Verizon, the water authority, OEM, DOT, etc. in order to not interfere with the search and rescue and other things going on. The spirit of cooperation was significant, particularly given the urgency and complexity of the issues at hand. Con Ed worked to restore power to Verizon so that the telecommunications could get up and running. Priorities were determined by OEM, the financial sector, and Con Ed.

NYSE goal was to open on Monday, September 17, 2001. NYSE had not lost any power during this crisis. However, only one line was operating and during the stages of fixing the lines, Con Ed had to be careful not to turn any power off for NYSE while testing was going on. They had generators for the NYSE due to a contract with the exchange previously (contract was initiated in the 1990's to have generators available within 6 hours), and while electricity was up and running on Monday, the generators were used in case there were any problems. They had to connect 80 locations east of Broadway to be able to trade on Monday. They built another substation by the Fulton Network substation, which usually takes two years to plan and bring online, but was accomplished

in eight months following 9/11. And they had to maintain, schedule, and plan around Verizon while NYSE was testing.

How decisions were made on where to place generators and how to prioritize work orders were made by the major customers dealing with their reps at Con Ed. Also the Eugene R. McGrath, Chairman of Con Ed received a call from Ivan Seidenberg, CEO of Verizon and went down there personally to see what was needed. They had planned for this at Con Ed so the steps were followed. Everyone knows what to do, top to bottom and it had been practiced with the city many times. They had drills all of the time, many unannounced and some where the scenario was changed in the middle of the drill, to require the relocation of Con Ed's command center.

OEM had a "war room" at the NYPD Police Academy.

Con Ed created a customer service center at 80 Pine Street.

One Con Ed employee was killed and many were injured in the collapse of the towers.

The cost of the 9-11 effort has been close to \$300 mm. It is possible that about 75% to 80% will be reimbursed by Congressional authorization to HUD but this has not yet occurred.

Add in gas and add in the work done by the end of the year and what is planned.

Con Ed reps stated that Kevin Burke, President and Chief Operating Officer of Consolidated Edison, attended the Market Closing meetings. They recommended that we look at a NSF study and will provide us the contacts. They also recommended interviewing Jerry Hauer, Richard Sheirer, and John Odermatt former directors of the NYC Office of Emergency Management. They also mentioned the Citizen's Budget Commission (Donna Fortuna) as a place to look at NYC cost numbers. They also will contact NYC Partnership to see if there is more cooperation we can get from that group.

The Critical Infrastructure Assurance Office (then in the U.S. Commerce Dept, and now in DHS), held a "lessons learned" conference in Austin, TX in late 2001 or in 2002.

A useful comparative analysis would be feeder outages on 9/11 vs. average feeder outages per year and/or per month.

Attachments:

Video

PowerPoint presentation

### ATTACHMENT TO CON ED MFR, DATED 2/26/2004

#### A New Source of Power Rises Over Ground Zero

DAVID W. DUNLAP The New York Times 5/25/04

Early on Sunday, May 16, with no fanfare, power began flowing through the Con Ed substation at the World Trade Center for the first time since 4:33 p.m. on Sept. 11, 2001.

Tomorrow, Gov. George E. Pataki, speaking by phone from the substation to Con Ed's energy control center uptown, will make it official: one more vital piece of the infrastructure around the trade center site is back in place, following the restoration of the subway tunnel for the Nos. 1 and 9 lines in 2002 and the opening of the temporary PATH station last year.

"In my 41 years with the company, this is the most difficult and complicated substation project I've ever built," said Eugene R. McGrath, chairman and chief executive of Consolidated Edison. The final project budget has yet to be tallied, but company officials said that constructing a new substation in Manhattan might be expected to cost about \$100 million.

The new substation, like the structure it replaces, doubles as the base of Silverstein Properties' 7 World Trade Center office building, across Vesey Street from the main trade center site. About 20 floors of steel now rise above the substation's 80-foot tall concrete shell.

Three transformers in the substation will each put out 80 megawatts of power. (The trade center used about 110 megawatts.) The substation now serves Battery Park City but will also eventually power the rebuilt trade center.

As many as seven transformers can be added. "This new substation will not only fully replace what we lost on Sept. 11," Mr. Pataki said in a statement, "but will also be large enough to accommodate the new electric demand that is expected."

In theory, only one transformer is needed today. But Stephen E. Quinn, the vice president for substation operations, said Con Ed builds in a double contingency, under which one of the transformers could be shut down for maintenance, another transformer could fail and the substation could still send out the needed power with the remaining transformer.

On the afternoon of the attack, Con Ed officials shut down the nine-transformer substation shortly before 7 World Trade Center collapsed. No one was killed or injured at the substation, but a retired Con Ed vice president for emergency management, Richard Morgan, died at the twin towers, where he had rushed that morning to offer assistance.

Con Ed managed to cope after the attack by adding five transformers to a nearby substation. The destruction of the trade center also substantially reduced demand.

The new substation is shaped to permit the opening of a private driveway along what was once Greenwich Street, a route blocked by the old 7 World Trade Center. The new form required squeezing the 40-foot-high transformer vaults tightly and stacking the switch gear overhead, no easy feat with cables so thick they need a five-foot turning radius.

This engineering challenge came on top of the already daunting task of restoring the underground power grid while Verizon, a next-door neighbor at 140 West Street, was trying to restore the intertwined ganglia of the telecommunications grid and the city was rebuilding sewer and water lines. "It's truly a story below ground," Mr. Quinn said.

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Area substations play the critical role of reducing the very high-voltage power from generating stations into a more manageable current that can be distributed across a small local network to residential and commercial customers.

At the trade center substation, power arrives through 138,000-volt cables. The cables run up to ceramic devices known as potheads, above which aluminum strands carry the power through circuit switchers and down to movable arms. When those arms swing into position, the electricity completes its journey to the transformers, from which it emerges at 13,000 volts. It then runs through the switch gear upstairs - in essence, automated circuit breakers - before it is sent out again under the streets to customers. The \$1.1 million transformers were made in Austria by Va Tech. Each is 20 feet tall, weighs 168 tons and is cooled by a giant radiator. It is the radiators - not the transformers - that are visible from the street, with their vertical cooling fins topped by large tanks holding mineral oil-based coolant.

Con Ed has 23 other substations in Manhattan. The company does not identify them, but they are not hard to spot if you have one in your neighborhood: a low, windowless, nameless building, often with colossal external vents to cool the transformers inside, surrounded by chain-link fences and, sometimes, concrete barriers.

By contrast, the trade center substation will be turned into a work of environmental art by James Carpenter Design Associates, working with the architectural firm of Skidmore, Owings & Merrill. It will be clad in ranks of prismatic stainless-steel bars, arranged in alternating angles to reflect different sections of the sky and surrounding streetscape. There will be a cavity behind the bars inside of which light-emitting diodes will be installed that can create changing patterns.

"The whole desire was to activate the base of the building," said Mr. Carpenter, who is also the collaborating artist on the Fulton Street Transit Center project, the design of which is to be unveiled tomorrow.