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How Con Ed turned New York City's lights back on

By Stephen Gandel, senior editor November 12, 2012: 1:56 PM ET

Hurricane Sandy took out four of the utility's power plants, and cut power to the company's headquarters. The untold story of how Con Ed recovered from the super storm.



It was, truly, a dark and stormy night.

On October 29th, the night Hurricane Sandy slammed into New York City, Consolidated Edison lost power not only to much of Manhattan below 39th Street, but to its own headquarters as well.

Con Ed employees had to take a raft up the flooded Avenue C, weaving in and out of floating cars, to rescue co-workers trapped in the company's crippled East 13th Street power station. Back at headquarters, the company's engineers took a risky short-cut in [restoring a downed power plant that ended up paying off](#). Had it back-fired, New Yorkers might have still been in the dark until the middle of the next week.

[And like the rest of us, days after the storm Con Ed nearly ran out of gas.](#)

And yet, through non-stop work and a number of well-calculated gambles, Con Ed was able to get the power back on in Manhattan in less than four days, about 12 hours faster than the utility promised a day after the storm.

"They did a wonderful job getting Manhattan's underground network back up and running," says Roger Anderson, who studies energy issues and is an adjunct professor at Columbia University.

Through interviews with CEO Kevin Burke, two of his top lieutenants and a handful of the company's other managers and emergency response personnel, Fortune has pieced together for the first time the story of how Con Ed was able to turn the lights back on in the wake of a storm that caused the worst flooding in New York City's recorded history.

Even two weeks later, Con Ed's job is not done. There are still 3,900 Con Ed customers without power, a fraction of a fraction of the nearly one million at the height of the storm. Another 22,000 buildings and houses are so damaged Con Ed can't restore power to them. In the housing projects of Brooklyn's Red Hook, for instance, elderly or sick residents are stuck on high floors with no heat, power or elevator service. Con Ed says the problem in Red Hook is partly to do with its equipment and the equipment in the buildings, which were flooded. Over the weekend, Con Ed estimated Hurricane Sandy will end up costing the company as much as \$550 million.

There were some mistakes. While it watched other stations, Con Ed never anticipated the flooding of its 13th Street power facility. That plant's flood walls, at 12 feet, proved to be about two feet too short for Sandy. Con Ed also called some customers the week of the storm to tell them that their power was back on, only to call them back and tell them to disregard the message. One customer tweeted, "Coned stop playing with my feelings!" Burke traveled to Westchester to apologize. New York Governor Andrew Cuomo has been critical of the utilities' response to the storm, including Con Ed.

But by all accounts, Con Ed's customers fared better in the wake of Hurricane Sandy than those of other nearby utilities. A day after the storm, Burke promised power would be on in Manhattan by Saturday evening. It

started coming back on Friday at a time when many customers of New Jersey's PSE&G and Long Island's LIPA were still in the dark, with no power and no idea when it would come back on. Over the weekend, 150 protestors picketed Long Island Power Authority's offices over its response to the storm.

Con Ed (ED) benefited from the fact that much of its wires, buried under the streets of Manhattan, were mostly untouched in the storm. But Con Ed's underground network and flooded power stations created a more difficult engineering challenge in turning the power back on than its rivals had. Mayor Bloomberg has praised Burke and his team.

Burke's most difficult task may still lie ahead. The company's shares have fallen 10% in the wake of the storm, erasing nearly \$2 billion of its value. Utilities don't have the same growth prospects of, say, an Apple. Instead, they attract investors with consistent earnings and high dividends. Burke will have to convince investors that being at the mercy, at least recently, of more and more storms won't change that. One answer is for Con Ed to bury the overhead power lines it has outside of Manhattan and enclose its power facilities near water behind brick walls instead of just relying on sandbags and flood walls. That will cost billions. Just days after making it through the storm, Burke says he doesn't think the expense is necessary.

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At the same time, Con Ed has to make sure its grid can continue to serve a growing city filled with a tech-savvy population increasingly dependent on a slew of electronic devices that are seemingly in constant need of a charge, on what could be the dawn of the era of the electric car. Cuomo is reportedly looking to upgrade the region's power grid with one that would be better able to pinpoint power failures and respond to them. "They are one of the best utilities in America," says Greg Reed, who heads up the Center for Energy at the University of Pittsburgh. "But the fact is like everyone else their stuff is aging."

Nonetheless, if investors were looking for a test to see if Burke and his team were up to the task of solving the company's biggest problems, Hurricane Sandy provided it.

Burke was in his office on the phone with the mayor's office when the lights went out.

Just a few minutes earlier, Burke had decided to shut down two downtown power stations. They were dangerously close to flooding. If left on, the power facilities could cause a short that could take down a large part of Manhattan power grid, or, worse, explode. The oil in the plants could burn for days. About 34,000 customers would lose power. But all of them were in flood zones, so hopefully they had evacuated before Hurricane Sandy. Burke had returned to his office to inform the mayor's office of his decision. And then suddenly, Burke was in the dark.

Out his window, he saw the tip of the Empire State Building floating above a city that had, seemingly, vanished. The only lights he saw down below were more than a mile uptown. Something had gone wrong.

Burke stepped into the hallway. Someone with a flashlight was coming toward him. Burke took the flashlight and raced up the stairs. Con Ed's offices did have some emergency back-up power, so he felt confident the lights in the company's 19th floor auditorium, which had been filled with tables and turned into a command center for Hurricane Sandy, had stayed on.

Around a corner on the 19th floor, Burke slowed when he saw light pouring into the hallway. He was relieved. By the time Burke reached the command room, word was already circulating through the media and among his staff that Con Ed's 13th Street sub-station, one of the largest in the city, had blown up.

In the room, John Miksad, one of Burke's top lieutenants, was on the phone with a crew at one of the lower Manhattan power stations that had been turned off getting a report on the flooding when the lights in the command

center went off and on. Miksad looked up at one of the three giant screens at the front of the room that displayed the number of Con Ed customers who had lost power. Before the lights went off it was about 100,000. When the screen came back on a moment later, the number had jumped by more than 200,000.

MORE: After Sandy, a flurry of stock market micro flash crashes

John McAvoy, another one of Burke's top lieutenants, was already on the phone with workers at the 13th Street station when Miksad came over. Everyone was okay. They didn't see any fires. Power was out. The first floor control room was still dry but outside the streets had turned into rivers. Water was pouring over the wall. They wanted out.

Miksad, though, wanted in. His computers weren't telling him anything. He would need to get into the plant and look at the equipment to know what had happened, but he couldn't leave the command center. He told McAvoy to send an engineer on the rescue mission.

Shortly after that, Miksad got an e-mail with a link to the now-infamous YouTube clip of the 13th Street substation. That was the first time he saw the flash. Technically, the plant hadn't blown up. It was what they call an arc, kind of like the spark you sometimes get when you plug something into an outlet, except much more powerful. Arcs happen. But the flashes are only supposed to last fractions of a second before breakers divert the current away from the problem. The flash Miksad saw in the video went on for 30 seconds, and it seemed to come in waves. He watched the video again and again. "That's when I knew we had a problem," says Miksad. "And it was a very, very big one."

On 14th Street and Avenue B, Benny Varughese, a Con Ed electrical engineer, met Brian McGeever, a Con Ed emergency responder, to rescue 11 Con Ed employees trapped in the substation. McGeever, Varughese and two fireman walked an inflatable raft into the water. About halfway between Avenue B and Avenue C the water was up to their waists and deep enough to put the motor down. They got in.

When they turned onto Avenue C, the current and the wind picked up. They had to weave in and out of floating cars. Waves landed in the boat. As they approached a building just north of 14th street, they saw two employees on the roof. The boat pulled up to the entrance, which was halfway underwater. McGeever reached over the raft into the dark water. The water made the boat jump and dive. McGeever was unable to get his key in the lock. He asked if the employees were alright. McGeever said they would be back.

MORE: Was the gas shortage preventable?

At the second building, McGeever was able to unlock the door. Inside, the lights were out. The workers were on the second floor trying to dry out their socks. The control room was flooded with four feet of water. One worker was missing. At the same time, word came in that a smoke stack on top of the power station was swaying in the wind and could fall. Everyone needed to be evacuated as soon as possible.

McGeever headed downstairs into hip deep water, while the firemen started to ferry workers back to Avenue B. McGeever found the missing co-worker huddled on top of a file cabinet in the dark. He was fine. After all the workers were out in both buildings, McGeever and Varughese got into the last boat out. McGeever looked back at the black buildings and took a picture with his cell phone.

A few hours after the sun came up, Burke got into a car and headed over to the 13th Street station. It was dry now. McAvoy was already there. The two men inspected the station. The first course of action was to dry and clean all the plant's equipment.

Restoring the high-voltage lines that bring power in the substation quickly would be a much tougher job. In most places in the country, high-voltage power lines are strung along electricity towers. Air can conduct electricity. So you need to keep the pair of high voltage wires that bring each electrical current in 30 feet or 40 feet apart so they don't cause a spark, and short out. But you can't do that in Manhattan.

Instead, the wires were surrounded by thick oil. That allowed you to put two into a 10-inch diameter pipe. The trick was that the pipes had to be heavily pressurize to keep all the air out. This is done by pumps. But when the station lost power, the pumps failed. Generally, it takes 72 hours to pressurize the pipes. So getting those pumps restarted as soon as possible was a priority. But like everything else in the plant, the **pumps** had to be cleaned and dried.

By mid-afternoon, Burke asked for a timetable as to when the power would be back on. Shortly before he had to leave for a press conference with the mayor, Burke got the word. Burke told reporters power would be restored to all of Manhattan by Saturday evening.

The last meeting of the day ended shortly after midnight. Burke went back to his office and into an adjoining small conference room. That's where he kept his cot. Burke pulled off his clothes and put on jeans. The building with no heat was getting cold. He closed the door and got into bed for the first time in 40 hours.

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By mid-day Wednesday, the pumps were still not ready to be turned on. McAvoy knew he had a problem. At this point, he wouldn't be ready to re-energize the high-voltage lines until mid-day Saturday the earliest. Fully turning back on the substation and reconnecting customers would take another 12-to-24 hours. And that was if the pumps were ready now.

McAvoy told his team to start running calculations. How many of the eight high voltage lines did he really need? A few hours later he got his answer: Three. If he focused his pumps on fewer lines he could pressurize the pipes faster. The risk was if one of those lines that he pumped didn't re-energize, or shorted out after it was turned on, McAvoy would have no back-up.

By Thursday, Con Ed was starting to encounter the same problem as everyone else in the New York: It was running out of gas. Katherine Boden, who normally runs the company's natural gas unit, had been moved over to

logistics a day earlier. She was now in charge of running the five temporary villages, including ones in Rye Playland and Met's baseball stadium Citi Field, for the thousands of out-of-town utility workers who had come to help. Boden had to make sure there was enough food and showers. But most important she had to make sure the wires, polls and transformers the workers would need to fix the power lines made it to the staging areas in the villages, and that the workers could get out in the field.

When Boden held her daily conference call with the camp operators, she got the same response from every staffer. We need gas. If they didn't get it, work on restoring the overhead powerlines would grind to a halt. Boden secured tankers to bring gas from miles away directly to where the workers were staying. The trucks began fueling up the Con Ed vans and other vehicles while the workers slept.

By Friday morning, McAvoy was feeling giddy. Three of the high voltage lines going into the 13th Street substation were ready to be turned on. Miksad thought they might have power back to some customers by mid-day. But when lines were turned on, current wasn't flowing. Some of the relay switches that were needed to close the circuit breakers in the power plant were not working. They needed to be replaced.

At 4:52 PM, Miksad stood up and yelled out, "We have restored power to Cooper Square." Workers in the 19th-floor auditorium who hadn't stopped working for days paused what they were doing and cheered. An hour later, Miksad announced that power was back on in Chelsea. City Hall returned an hour after that.

Shortly before midnight about half the networks that were lost in Manhattan had been re-energized. That was enough for Miksad to feel comfortable Con Ed would deliver on Burke's promise. He said good night to McAvoy and headed down to his office cot. By 5:00 AM on Saturday, the power in all of Manhattan was back on.

Burke woke up in his cot before dawn. He opened the door between his makeshift bedroom and his office and saw something that he had long taken for granted, but now cherished again. The Empire State Building was

lit up from head to toe. That city that he loved, and had temporarily disappeared, was back. Burke, who isn't prone to grand statements, said, "It felt pretty good."

Posted in: [Con Ed](#), [Hurricane Sandy](#)

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Stephen Gandel has covered Wall Street and investing for over 15 years. He joins Fortune from sister publication TIME, where he was a senior business writer and lead blogger for The Curious Capitalist. He has also held positions at Money and Crain's New York Business. Stephen is a four-time winner of the Henry R. Luce Award. His work has also been recognized by the National Association of Real Estate Editors, the New York State Society of CPA and the Association of Area Business Publications. He is a graduate of Washington University, and lives in Brooklyn with his wife and two children.

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