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Hon. Jeffrey Cohen
Acting Secretary
State of New York
Public Service Commission
Three Empire State Plaza
Albany, New York 12223

Re: Case No. 13-E-0025 – Utilities' Hurricane Sandy Storm Performance

Dear Secretary Cohen:

Attached please find AT&T's response to Staff's Request for Information Regarding Telecommunications Services Restoration Following Superstorm Sandy. Please do not hesitate to contact me if you have any questions regarding this matter.

Respectfully submitted,

Mary E. Burgess

NYPSC Case No. 13-E-0025

UTILITIES' HURRICANE SANDY STORM PERFORMANCE

AT&T SERVICE RESTORATION FOLLOWING SUPERSTORM SANDY

1. **Please identify actions taken prior to the storm (including network preparations, personnel/equipment resourcing and staging, consumer notifications, and weather-monitoring activities) to prepare for storm-related outages and service affecting conditions.**

AT&T is a pioneer in what is now commonly referred to as Business Continuity Planning. Our Network Emergency Management operation is one of the most capable operations in the world, representing a cumulative investment of over $600 million. Each year, AT&T conducts four full-scale disaster recovery field exercises and several other smaller-scale field exercises, in cities across the United States, Canada and Europe. Our network continuity and recovery efforts are based on the "three P's": planning, predicting, and preparing. AT&T's actions prior to the Superstorm Sandy highlight the value of this approach.

In the days before Superstorm Sandy struck, AT&T continuously monitored multiple weather forecast models from external and in-house meteorologists. Those forecasts indicated that the storm had the potential to impact a very large geographic area encompassing New York and several other states.[1] Based on AT&T's experience planning for and responding to other wide-area storms, we anticipated that the extent of the impact of the storm on any specific area would depend on the actual path the storm took. Indeed, that was the case with Sandy -- areas closer to the center of the storm but on the left/south edge of the storm's path suffered less damage than other areas farther away from the center, but to the right/north of the storm's eye. As we all now know, Sandy was nearly the "perfect storm," that combined a tropical hurricane with an arctic Nor'easter, making landfall at high tide, under a full moon, and south of New York City so as to drive a massive, record-breaking storm surge into Raritan Bay, Long Island Sound, and New York Harbor. Ultimately the 1000-mile wide storm would prove to present unprecedented challenges to both the public and private sectors. AT&T's robust network recovery mechanism rose to those challenges.

Given the magnitude and geographic size of the storm, AT&T made its preparations on a regional basis, rather than on a narrow, state-specific basis. This gave AT&T substantial flexibility to respond to the places that needed the most attention after the storm. That

[1] The FCC also anticipated that the storm could impact a very broad geographic area, and thus activated DIRS reporting requirements in 156 counties across 10 states.

approach served AT&T well. After the storm, AT&T had assets available within and across the region to aid with the restoration effort, and thus was able to quickly move more equipment to New York when it became clear New York had suffered such extensive damage, such as flooding in the subways and transportation tunnels, and fuel pipeline impairment.

AT&T's planning activities included numerous, recurring conference calls to coordinate operational leadership and execute pre-storm checklist and preparations. AT&T undertook those efforts to ensure that the network team would be as ready as they could be for the storm's landfall and to ensure that all systems and resources, including IT Operations and Supply Chain, were fully prepared.

As would be expected in the circumstances, work schedules were rearranged, and vacation and travel plans altered. AT&T pre-positioned necessary personnel for rapid deployment -- both local and affiliate employees, as well hundreds of mutual aid workers -- so that they would be immediately available for dispatch as soon as it was safe to do so. Further, we provided emergency credentialing as necessary.

In addition, AT&T drew upon expertise and resources from other regions of the country and supporting departments acting at the direction of the team leading the Sandy response efforts. For example, the supply-chain organization arranged for uninterrupted fuel deliveries from distant sources, in a way that was not dependent of the availability of retail fuel supplies or commercial power. The planning and preparation which enabled the rapid expansion of this fuel-supply chain under adverse market supply conditions was a critical capability. Ultimately over 50 tanker truckloads of fuel were imported.

Additional pre-storm activities included preparatory sandbagging at 8 locations, pre-staging and preparing 700 regional generators in strategic locations that were out of harm's way but readily deployable, and re-positioning another 2,300 generators for deployment from other locations. We also topped-off the fuel for all affected equipment and switching offices, and tested stationary emergency generators.

AT&T also readied 40 regional Cell On Wheels (COWs), 2 Satellite Cell on Light Trucks (SatCOLT) and 2 Emergency data and VoIP Communications Vehicles (ECV), and had an additional 22 COWs, 4 SatCOLTs, and 3 ECVs staged for deployment.

2. **Please describe post-storm damage assessment activities to include:**

   a. **mobile central offices impaired or out-of-service (OOS), location and cause**

b. number of cell sites impaired or OOS – and identify cell site OOS conditions by cause (power, backhaul, facility flooding, electronics/antenna damage, etc.), and

c. number of customers affected (estimate may include blocked call figures or some other basis, such as CMA customer data, or calculation used for FCC reporting).

AT&T's network monitoring centers monitored and assessed the impact of the storm on the network continually throughout the storm and thereafter. AT&T determined that cell system outages AT&T experienced were attributable to three causes – damage to AT&T's equipment, loss of commercial power, and loss of backhaul transport between AT&T's cell sites and its switching equipment. Only a very small percentage of AT&T's outages -- less than 2% -- were caused by physical damage to AT&T cell towers and equipment. With respect to those damaged sites, AT&T followed a strategy of deploying COWs or SatCOLTs to fill gaps caused by the loss of the damaged towers and equipment.

The loss of commercial power to AT&T cell sites was not the primary cause of AT&T wireless service outages. AT&T anticipated and prepared for commercial power outages, and when those outages occurred, AT&T utilized back-up power to support its facilities and equipment. In the aftermath of Sandy, AT&T utilized a combination of battery backup and thousands of stationary generators and mobile generators to maintain power at its facilities across the region impacted by Sandy.

The biggest cause of outages for AT&T was the loss of backhaul transport obtained from other telecommunications providers. Indeed, in most instances where AT&T cell systems were not functioning, the problem was the absence of working backhaul/transport circuits, not any failure of AT&T's back-up power program. If transport and backhaul systems supporting a cell site continued to work, then AT&T's own battery and generator back-up power resources allowed AT&T to continue to provide service in most areas until commercial power was restored. However, if transport or backhaul circuits did not work, AT&T's wireless systems connected to those circuits were also out of service, even if power was available at cell sites.

3. Please provide a daily timeline that reflects outages and restoration of cell sites and impact on capacity (in terms of % impacted), by County, from October 29 until back-to-normal conditions returned.

Following the storm, Department of Public Service Staff requested that AT&T and other wireless service providers submit daily reports regarding cell site outages in eight counties – Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, and Westchester. AT&T provided the requested information for several weeks, until the Department said that the reports were no longer necessary. Due to the competitively sensitive nature of the information, it was

provided on a confidential basis, and marked accordingly under federal law, and was not made publicly available. The NY Ready Commission Report contains a daily timeline for the four major carriers' restoration progress from the storm until back-to-normal conditions returned after Winterstorm Athena. AT&T believes the staff's industry aggregate report is a reasonable depiction of the storm's impact and recovery.

4. **Please discuss difficulties or delays (unsafe conditions, access, etc.) encountered when performing damage assessment and restoration, and ways the company worked around such issues.**

Because the safety of our employees and mutual aid workers properly was of paramount concern, AT&T dispatched restoration and response teams only when it was safe to do so following the storm. Once it was safe to do so, early in the morning after the storm passed, AT&T deployed an army of employees and contractors, from more than a dozen states, all working around the clock, utilizing AT&T's vast Network Disaster Recovery assets to restore services as quickly as possible in New York and the other states hardest hit by the storm.

With respect to difficulties AT&T encountered, some employees encountered difficulties in attempting to cross the bridges to get into and out of NYC due to credentialing and curfews, which posed unique challenges. AT&T and its employees, like many others in the storm-impacted region, also had to deal with the disruptions in the commercial fuel delivery systems in the region, which necessitated gas rationing for the first time in decades. To address that, we established temporary "filling stations" at company locations for employees to refuel their cars so that they could get to work.

Restoration efforts were also hampered by the snowstorm that followed Sandy just a few days later. Because the forecast for the snowstorm called for high winds that exceeded the maximum the safety ratings of many of the COWs, COLTS, and ECVs we had deployed in Sandy's wake, most of those vehicles had to be deactivated and their masts or dishes had to be stowed safely until the storm passed. As soon as it was safe, AT&T promptly reactivated those vehicles.

5. **Please discuss if weather impact to your network in other states affected your company's emergency response/restoration capabilities or efforts in New York State.**

Because Superstorm Sandy was predicted to be a massive storm affecting a large geographic area, AT&T prepared for the storm on a regional basis, and therefore our response efforts were not adversely affected by the weather's impact on our network in other states.

6. **Please discuss how your company assisted customers and communicating critical information to the general public and government official, including, but not limited to:**

a. steps taken to notify estimated restoration times;

b. use of website, press releases, radio/television spots, stores/kiosks, etc.;

c. issuance of customer credits or billing adjustments;

d. handling of storm-related complaints; and,

e. greater use of roaming during the event, including any mutual agreements with other carriers to accomplish.

AT&T recognized the importance of keeping its customers informed in the days leading up to and following the storm, and began issuing press releases several days prior to the storm's landfall to advise customers regarding supplies that they should have to prepare for the storm, and what they should do in the event of a loss of service. AT&T advised customers to expect high call volumes, keep non-emergency calls to a minimum, and use text messaging where possible, to avoid adding to network congestion.

AT&T was in constant communication with government agencies and officials from the State and New York City, including the NYS Office for Homeland Security and Emergency Services, the NYS Public Service Commission, the NYC Mayor's Office, and the NYC Department of Information Technology and Telecommunications.

One significant action taken by AT&T to ameliorate the effects of Superstorm Sandy on our customers was the agreement we entered into with T-Mobile. Because AT&T and T-Mobile use comparable GSM network technologies, we entered into a roaming agreement with T-Mobile allowing customers to use whichever network was most functional, with no roaming charges.

On the customer service front, AT&T adjusted its billing and credit policies to accommodate customers impacted by Superstorm Sandy, and suspended collections activities beginning when the storm began until well after AT&T's service had been restored in the eight affected counties in New York. AT&T waived voice and text overage charges through the end of November for customers in the Bronx, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, and Westchester counties. AT&T also extended the late-payment window for wireless customers who were behind, and waived late payment fees.

7. Please quantify the number of workforces assigned to recovery efforts; if NYS workforce was supplemented with contractors or other external personnel, please quantify and identify where supplemental workforces were deployed.

AT&T deployed a workforce of more than 2,500 responders from more than twelve states to assist in every facet of service restoration following the storm. AT&T's NYS workforce was supplemented with AT&T employees from other states, as well as contractors and external personnel where circumstances warranted. Significant managerial, technical, and engineering

and support resources were utilized in the restoration effort from locations across the country. The ability to draw on such virtually-located resources was important because many employees' own homes and families were impacted by the storm.

8. **Please identify the number of portable generators deployed; whether generator inventories were sufficient for the weather event; and, if there were circumstance that precluded generator deployment to any cell sites.**

AT&T had sufficient generator inventory for Sandy. In the aftermath of Sandy, AT&T deployed[2] mobile generators 411 times to support AT&T's wireless network in the 8 New York counties impacted by the storm (the five Boroughs of NYC, Weschester, Suffolk and Nassau). Across the entire storm-affected region, over 600 crews were engaged to deploy, redeploy and refuel generators. Crews were assigned a very small number of mobile generators so that they could promptly deploy them, refuel and maintain them, and once commercial power to a cell site was restored then re-deploy them as other cell sites with working backhaul circuits but no commercial power were identified.

Generator deployment difficulties generally occurred in highly urbanized areas where cell sites frequently are located on rooftops. For instance, it is common across the industry that some property owners will not consent to stationary generators or the associated fuel storage, and some sites cannot accept a mobile generator. AT&T experienced some of those same difficulties during Sandy.

9. **Please provide an overall description of backup powering in the NYS network, and any steps to enhance power resiliency.**

Given the broad reaching impacts of Sandy, the majority of AT&T's wireless telecommunications facilities utilized back-up batteries and/or generators for at least some period of time. AT&T cell sites are equipped with back-up battery power that is designed to activate automatically when commercial power is lost. Batteries, however, are short-duration solutions, primarily intended to buffer sensitive electronics from instability and impurities in commercial power and to address typical short-duration commercial power outages such as the preponderance of outages that occur throughout the year. For longer duration events, AT&T uses a combination of stationary and portable generators that are typically diesel-fueled,

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[2] AT&T's deployment count includes both mobile generators that were connected to AT&T cell towers and equipment, and mobile generators that were dispatched but for various reasons -- such as the restoral of commercial power or the failure of backhaul transport in the interim, making the use of the mobile generator unnecessary or irrelevant -- were not connected to cell towers or equipment. Superstorm Sandy created a very fluid logistical situation, and AT&T dispatched generators based on a sophisticated triage/restoration process.

although sometimes are powered by natural gas or gasoline. These generators are sized to carry the cell site load, with a comfortable margin, including HVAC systems load, and to fully recharge batteries. Larger generators can run at lower engine speeds, which makes them quieter and more efficient and extends fuel range, thereby reducing refueling requirements.

As described in the response to question #1 above, AT&T pre-staged literally thousands of generators across several states in order to maximize flexibility in responding to back-up power needs. In addition, because generators require periodic refueling, in response to Sandy AT&T engaged a fleet of over 50 tankers to import fuel to our staging areas, coming from locations such as Baltimore, Buffalo, and even Texas. Generally speaking, the fueling and re-fueling operation was smooth and successful, in that AT&T carried out thousands of safe and environmentally responsible fuel transfers.

10. **Please discuss circumstances affecting network and service restoration, which may or may not be within the company's control (backhaul or commercial power problems, area denial or access, fuel shortages, communications with backhaul and commercial power providers), and any steps taken to manage those conditions.**

Commercial power outages adversely affect AT&T telecommunications facilities in two ways. First, when power is lost to AT&T facilities and equipment, such as at cell sites or cell towers with AT&T wireless equipment, AT&T must utilize alternative, back-up power to support its facilities and equipment. In the aftermath of Sandy, AT&T utilized a combination of battery backup, fixed generators and mobile generators to maintain power at its facilities. As noted above, prior to the storm, AT&T made preparations to deploy and fuel the thousands of generators required to keep AT&T's network functional in the absence of commercial power.

Second, power outages also impact facilities AT&T purchases from third parties. AT&T purchases substantial quantities of backhaul or transport facilities that connect AT&T cell sites to our mobile switching infrastructure from other telecommunications service providers, such as Verizon and Frontier. Such services are generally provided via landline facilities. The providers of backhaul and transport circuits also rely on commercial power at their locations for the circuits to work. Thus, even if AT&T has power at its own cell sites, if our transport and backhaul circuit providers cannot provide service because of a power outage, AT&T's wireless systems connected to those circuits are effectively out of service.

The loss of commercial power to *AT&T cell sites* was not the primary cause of AT&T wireless service outages. If transport and backhaul systems supporting a cell site continued to work, then AT&T's own battery and generator back-up power resources would allow AT&T to

continue to provide service in most areas until commercial power was restored. However, if transport or backhaul circuits did not work, AT&T's wireless systems connected to those circuits were also out of service, even if power was available at cell sites.

Indeed, the failure of transport and backhaul services, provided via landline facilities, had the greater impact on the lack of wireless service during Sandy. The causes of transport and backhaul outages may have been influenced by a lack of power availability to the transport and backhaul providers, or, as in lower Manhattan, may have been caused by both a lack of power and flooding where the equipment used to provide transport and backhaul was located. In any event, where transport and backhaul was unavailable, wireless communications could not occur.

11. **Please discuss any requests for emergency communications support from local, state or federal officials or local communities, actions taken, and challenges faced in attempting to fulfill those relief requests.**

AT&T dispatched Satellite COLTs to support public safety and/or humanitarian efforts in New York to six locations, specifically: Staten Island; three locations in the Rockaways; and two locations in Long Beach. These areas were particularly hard hit by the storm, and the immediate need for government agencies to access AT&T's mobile network to aid residents and businesses in those areas was the predominant reason for dispatching COLTs there. In addition, AT&T dispatched one COW to Staten Island, at the request of FEMA.

AT&T also dispatched ECVs for public safety and/or humanitarian reasons eight times: at the Vladic playground in Manhattan; in Redhook Brooklyn (twice) and Brighton Beach Brooklyn; two ECVs were sent to the Rockaways; and two ECVs were sent to Staten Island. Generally speaking, ECVs were dispatched to allow citizens in those areas, whether AT&T customers or not, to charge their phones and gain WiFi access to the Internet and contact family and friends; however, one ECV was dedicated to provide a closed system for the New York City Fire Department.

In addition, AT&T established charging/aid stations, in coordination with the City of New York. The charging/aid stations were set up on a daily basis, with more than a dozen operating concurrently, and moved throughout the City to assist residents in different parts of the City. AT&T provided fuel, portable heaters and generators to support the stations, and moved generators from place to place as stations were moved. All told, AT&T dispatched portable generators to support aid stations 56 times. Those dispatches were in addition to the deployment of mobile generators to cell sites.

12. **Please highlight operational successes, temporary measures, and any other activities your company undertook to aid customers and New Yorkers, in responding to Sandy.**

AT&T is very proud of the extraordinary actions undertaken to respond to the needs of its customers, its employees, the government, and other carriers following Superstorm Sandy. We provided fueling stations, sleeping bags, and blankets to employees in areas of need. We established emergency charging stations at open AT&T Stores and 56 public aid stations in NYC. AT&T worked closely with government agencies to keep them informed of our service restoration program, and to place portable wireless facilities -- COWs, Satellite COLTs and other ECVs -- where they were most needed. We also provided free wireless phones to first responders.

In addition, we set up free charging and WiFi stations so that people without power -- whether AT&T customers or not -- could charge their phones, make calls and connect to the Internet.

We would also highlight the arduous yet successful generator refueling program we put in place. As described above, AT&T brought into the region more than 50 tankers full of fuel from literally as far as thousands of miles away, to keep portable and stationary generators fueled. That was particularly important in light of the extensive fuel supply problems caused by Sandy.

13. **Please discuss lessons learned, areas for improvement, actual or anticipated changes to emergency plans or other actions to be taken, which will enhance or improve your operation's preparedness and resiliency in future emergency events.**

While power (commercial and emergency generators) continues to be an issue, the availability of backhaul transport was the most significant item impacting the wireless infrastructure. One lesson from Sandy is the importance of preventing saltwater from penetrating power and landline telecommunications systems in central business districts such as Manhattan, where wireless carriers may not be able to feasibly or safely place stationary generators or deploy portable generators because of the height and density of buildings.

In the same vein, flooding presents unique challenges, particularly for refueling and logistical support. In addition, the impact of Superstorm Sandy on the New York City region demonstrated that in areas not as accustomed to hurricanes, the governments, infrastructure, and citizens are not as prepared for such events as those in other parts of the country, like the Gulf States. Finally, it appears that building codes and EPA regulations contributed to the vulnerability of certain structures and geographic areas.

AT&T is also examining what additional steps can be taken to provide back-up power at its cell sites in Manhattan and elsewhere. The challenge in dense areas such as Manhattan is that wireless antennae and equipment are often located on rooftops. In Manhattan, these rooftop are generally quite high. Placing power sources, and especially their fuel storage, on rooftops raises a number of engineering, legal, and safety issues that will need to be addressed before additional power sources can be provisioned in dense, urban areas.

Because we faced some of the same service restoration challenges as the electric utilities -- and we fully appreciate the enormity of the tasks those companies and their employees faced -- AT&T can offer some constructive suggestions on improvements that will better prepare electric companies and landline carriers (which provide services to wireless providers) for future disasters. As the Commission is aware, the wireless network requires electric power and landline services to operate, both at cell sites and at facilities housing network electronics. Although AT&T anticipated and fully prepared for commercial power disruptions in Sandy's wake, the reliability and availability of landline services and commercial power following natural disasters can be improved.

Some improvements are relatively easy and inexpensive. For example, going forward, AT&T recommends that cell sites and other locations housing telecommunications electronics be designated for high priority power service restoration. Consumers are becoming increasingly reliant on wireless services for voice, data and video needs, and prompt restoration of wireless services will keep them connected to their world. More importantly, first responders, including power company field personnel, have also become more dependent on wireless communications.

To further aid in prompt service restoration, AT&T recommends that electric utilities accelerate the placement of "smart meters" particularly at telecommunications facilities. As discussed below, "smart meters" can provide the electric companies with real-time information on specific locations where power has been disrupted. Once telecommunications facilities are equipped with smart meters and have been designated for high priority service restoration, power disruptions at telecommunications facilities can be kept to a minimum. Smart meters will reduce unnecessary truck dispatches by electric crews to areas that have already been restored. Adding the intelligence derived from smart meters to the electric distribution system improves electric restoration for all customers.

Another lesson learned is that, in advance of future events, fuel truck drivers need to be provided with credentials that allow for access to areas where only first responders are permitted. Despite the overall success of AT&T's refueling program, in the wake of the storm, some roads were closed to all traffic except first responders. In some instances fuel deliveries

were delayed because drivers lacked the necessary credentials or their credentials were not accepted.

14. **Please indicate how network resilience and restoration could benefit from : a) better coordination of activities with electric utilities and other telephone carriers; b) use of shared spare parts stockpiling and management among carriers (e.g., electronic equipment, poles, cabling generators, etc.); and, c) improved cell tower citing and equipment collocation procedures.**

The two recommendations with respect to commercial power in the response to question 13 -- priority restoration and smart meters for telecommunications facilities -- would substantially improve the restoration process. By designating telecommunications facilities for high priority service restoration and equipping telecommunications facilities with smart meters so that the electric company will have immediate information regarding where service is out, the electric companies will have real-time, network-wide, automated information they can use to restore service to telecom carriers on an expedited basis.

The roaming arrangement between AT&T and T-Mobile allowed the customers of those two companies to roam for free on the companies' networks. Although that does not squarely fit into the category of "network resiliency," the benefits to AT&T and T-Mobile customers from that arrangement are self-evident.

As noted above, AT&T's cell towers and related wireless transmission equipment suffered minimal physical damage from Superstorm Sandy. Although each storm or disaster is different, based on how well AT&T towers and transmission equipment withstood the storm, AT&T does not foresee that inter-company equipment sharing or that different decisions about tower design and placement or equipment collocation will be valuable. Indeed, unlike terrestrial carriers whose central offices or distribution areas are typically coterminous and mutually exclusive, cell carriers' sites typically overlap, and particularly in urban areas, having one cell site out of service does not necessarily mean that wireless service is unavailable in that area because of the overlapping structure.

By the same token, the more cell sites carriers have in the future, the more likely it will be that cell sites will overlap and thereby minimize the impact of future storms and disasters. In that regard, all carriers would benefit from a uniform, statewide law that reduces the time, expense and administrative burden carriers currently face in obtaining approval of applications for new cell sites and the collocation of wireless equipment on existing sites.

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The foregoing responses focused on AT&T's wireless network and services, because Sandy impacted AT&T's wireless network and services the most. At the Staff's request, however, AT&T provides the following additional information about its wireline network.

Superstorm Sandy also affected AT&T's wireline operations in New York City, albeit to a much lesser significant extent. At AT&T's office located at 75 Broad Street, water flooded the basement and first floor, destroying the building's power equipment. The node was equipped with battery backup, but the building owner was unable to pump fuel to the standby generators, so when the battery life exhausted, the node equipment failed. AT&T dispatched personnel and a 1750 kW portable generator (as well as a 1600kW portable generator as a backup and one small 10kW generator) to the location before battery backup exhausted. Once on site, AT&T personnel cabled in the portable generator and restored service to the site. It took some time to complete those efforts after the battery life was exhausted, but the total down time of the node was approximately 18 hours.

AT&T also deployed a 500 kW generator to Bush Terminal in Brooklyn. That site was lost when the basement was flooded and the switch gear and fuel pumps stopped functioning. We utilized an onsite 800 kW permanent generator, and alternated between the portable and permanent generators. The site was kept on air with the use of both generators and multiple fuel deliveries per day.