

Testimony of
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Hearing on
“Communications in a Disaster”

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Thank you, Chairman Stevens, Senator Inouye, and members of the Committee.

My name is Hossein Eslambolchi, and I am the President of AT&T’s Global Networking Technology Services and AT&T Labs. I also serve as AT&T’s Chief Technology Officer and Chief Information Officer. I advise AT&T’s chairman and senior leaders on technology issues, and serve on AT&T’s Executive Committee, the company’s governing panel.

In particular, I am responsible for AT&T’s strategic technology direction, network operations, research and development, and information technology systems and processes. My network operations duties include responsibility for the design, development, engineering, operations, reliability, and restorability of AT&T’s global network, and the development and creation of new services, tools, and capabilities for next-generation Internet Protocol (IP) networks. I joined AT&T’s Bell Laboratories in 1986 and have more than 17 years of expertise in designing and developing packet networks. I also have spent significant time working on the reliability and restorability of telecommunications networks. In this regard, I headed the

development team for AT&T's Fast Automated Restoration System (FASTAR), which AT&T successfully deployed in 1992, making it possible to quickly restore service when high-capacity fiber optic cables are damaged. As head of AT&T's global network, I am also responsible for AT&T's network disaster recovery capabilities and operations.

I want to thank you, Mr. Chairman, for calling this important hearing and for allowing me the opportunity to share with you what we have done and are doing generally to ensure the reliability and restorability of AT&T network services, and what we at AT&T have been doing specifically in response to Hurricane Katrina. After discussing our efforts generally to protect our network and our customers from disruption, there are four areas on which I would like to focus my remarks today: the impact of Katrina on AT&T's network, AT&T's assistance to first responders, other carriers, and those people directly affected by the storm, the lessons we have learned, and our policy recommendations. You also will see why we at AT&T speak of a spirit of service and a spirit of compassion in connection with our disaster-related activities.

I. PROTECTING CRITICAL COMMUNICATIONS INFRASTRUCTURE

A. Preparation

As a preliminary matter, there are three overarching steps that AT&T has taken – and that are essential to protecting vital communications infrastructures. The first begins long before any disaster occurs. It entails *preparation* to ensure that the network and its components are as reliable as possible through proper design, hardening, redundancy, and performance at levels that far exceed routine needs. At AT&T, for example, we engineer our network to “five nines” of reliability – 99.999% reliability – that requires a diversity of communications links and

equipment. When links and associated systems fail, there must be instantaneous and seamless rollover to backup facilities. This capability must be periodically tested, and given the frequency of cable dig-ups throughout the country, let alone emergencies of unprecedented scale such as Katrina, this testing must occur frequently.

Proper preparation, however, also contemplates that even the best facilities could fail. Proper preparation therefore requires rigorous planning for service restoration, including advance placement and availability of service restoration equipment where it can quickly meet identified needs, and ongoing training to ensure the availability of the skilled workforce needed to restore service. We make restoration our first priority and then move on to make repairs.

Such a commitment to preparation, excellent service in the face of disaster, and responsiveness to threats to our networks and customers, does not come cheaply. At AT&T, we have invested approximately \$350 million since 1991 in our mobile Network Disaster Recovery (“NDR”) infrastructure. We can quickly bring Emergency Communications Vehicles (“ECVs”) wherever needed to provide communications services in an emergency, and we have more than 150 tractor trailers of various kinds stored in locations around the country and loaded with generators, fiber and other supplies, repair and restoration facilities, circuit and packet switching, HVAC capabilities, lights, batteries, chillers, pumps, food, first-aid and whatever else may be necessary to make our response effective. We have extensively drilled our teams in various scenarios on a quarterly basis to ensure that readiness remains at peak levels.

Our NDR disaster planning and Continuity of Operations Plan (“COOP”) gives us the ability to duplicate necessary capabilities quickly to meet or exceed our customers’ business needs and continuity requirements, including those of our government customers. This has many

components, including unparalleled security capabilities, logical systems, and physical capabilities. Network security is of particular importance given the prevalence of attacks through worms and viruses and the possibility of related threats. AT&T works diligently to provide network security for our infrastructure and to our customers, and although that was not an issue in this disaster, it is a critical issue and threat almost every day. Network security requires great focus and attention, and will certainly remain a critical challenge that may someday be the subject of another “lessons learned” hearing.

AT&T also established a system level Certification and Assurance governance process whereby we measure our estimated likelihood of recovery in the event of an incident. We then drill down to the component level and assess the consequences of a potential failure and the impact to our business. We work to mitigate the risk of failure by either eliminating the threat and the vulnerability, or by mitigating the exposure. This process informs our rigorous business case analysis and brings clarity to investment decisions. We regularly assess these components both for ourselves and on behalf of our customers.

B. Execution

The second vital step to protect communications infrastructure requires *execution* during and immediately following a disaster. In many respects, execution is a function of proper preparation, particularly having a robust infrastructure, a well-trained and frequently-drilled workforce, and facilities and capabilities available for service restoration. Effective execution also requires a sophisticated command and control structure in emergencies to make every minute count, every deployment as effective and efficient as possible, and to enable our dedicated employees to work as safely and effectively as possible. We follow an "incident

command structure," which is led at every moment by an experienced Executive Duty Officer. A similar system is frequently used by first responders.

In addition, execution requires close coordination with third parties, including federal, state, and local government authorities and first responders, others in the telecommunications industry, and others in the private sector trying to restore essential services and facilities, such as power, water, roadways, and the like. This communication and coordination effort is often the most difficult part of execution during and immediately after a disaster. In the communications field, the telecommunications industry response to disasters, other than that of a company responding to damage to its own facilities, is typically coordinated through the National Coordination Center ("NCC"). The Department of Homeland Security participates in the NCC through the National Communications System ("NCS"), as did the Federal Communications Commission ("FCC") during the response to Hurricane Katrina. This important entity matches telecommunications companies to those governmental entities with unmet emergency telecommunications needs.

Finally, execution requires ingenuity and resourcefulness when the unforeseen happens. Each emergency situation presents its own unique set of challenges. Even the most thorough planning and training cannot take the place of highly skilled and resourceful emergency responders who can recognize and adapt to unplanned circumstances.

C. Evaluation and Improvement

Finally, the protection of the communications infrastructure requires a thorough and frank after-the-fact evaluation of performance, distillation of lessons learned, and implementation of *improvements*. In this regard, one outcome of Hurricane Katrina should be a critical

reassessment of our performance as individual communications companies, as an industry, and as a nation, and implementation of the policy recommendations needed to improve performance in the future.

I hope to address each of these steps in my testimony today, both in general and in light of our recent experience with Hurricane Katrina. At the end of this testimony I also offer some policy recommendations to advance this necessary national discussion.

II. IMPACT OF KATRINA ON THE NETWORK AND ITS RESTORATION

Overall, AT&T's network remained overwhelmingly intact following the hurricane and flooding. At all times, we were able to carry at least 95% of the calls in the Gulf Coast area that came to our network. Of the 5% of our capacity in the area that was initially lost, FASTAR, our software system that redirects and reroutes traffic, restored half of that capacity within a couple of hours. Within 24 hours of the storm making landfall, another quarter of that capacity was restored via manual rerouting, and the final quarter was restored within 48 hours of the storm making landfall when AT&T workers physically installed two cables in the ground and rerouted certain traffic. This latter effort successfully worked around the loss of certain regenerators that send digital bits long distances over fiber. On a nationwide basis, on the day of Katrina and over the next few days, we successfully carried intercity traffic at levels that exceeded demand the week prior to Katrina by approximately 10%.

Nonetheless, because we interconnect with other carriers, including local exchange carriers and wireless carriers, we could not complete calls to other networks that suffered more

severe disruptions. As a result, following Hurricane Katrina's landfall on the Gulf Coast, we needed to block millions of calls a day into the affected area due to outages in other networks.

We built our only major switching station in the New Orleans area on high ground and, therefore, it was not flooded. One of our most immediate concerns in the aftermath of Katrina regarding that facility, however, was looting and security. Security concerns forced employees to evacuate our switching center late in the afternoon on August 31st as local law enforcement was unable to ensure the safety and security of the site. Fortunately, the building was secured late that night, and our employees returned to the building the following day, together with BellSouth employees who worked in the same building. At that time, our people delivered to the building fuel for the generators, water for the air conditioning chillers, food, and other supplies. Law enforcement authorities also set up operations in the lobby of the building in order to utilize the telephone connectivity available there. During the period that our employees were out of the building, the network infrastructure was put on automatic controls and monitored remotely by the AT&T Network Operations Center.

We had more than 100 offices lose commercial power, usually briefly, at one time or another. Fortunately, we had sufficient backup generators and enough fuel for them. We were able to restore power by putting many of these sites on generators, and by making use of batteries or fuel cells in connection with a few. We replenished fuel supplies as necessary to avoid disruption, but our preparations included staged supplies of thousands of gallons of gas in portable containers, thousands of gallons of diesel fuel in portable cells, and thousands of gallons of water in portable tankers for cooling towers. We continue to have fueling plans in place for each of our sites in the area, all of which have at least two to three days of fuel supply which we

are topping off regularly. Importantly, very good progress has been made now in the region to restore commercial power.

At this time, the AT&T network has been fully restored and repaired. We will remain engaged, however, during broader recovery efforts to ensure continued operation of our facilities, and to lend support to others where we can.

III. AT&T'S KATRINA RESPONSE AND OUTREACH

AT&T began moving equipment and teams from around the country toward the Gulf States in the days before the storm made landfall. As the path of the storm became clearer, AT&T moved its assets closer to where they would be needed, but not so close as to be put in danger by Katrina. We followed our prescribed approach. The first team restored AT&T's service to its prior levels, the next maintained and monitored AT&T's facilities so as to prevent new issues from arising, and the third came in to help others. AT&T worked around the clock to respond to this crisis and safeguard its network, support efforts to respond to the disaster, and address the needs of evacuees.

Because we fully restored and secured all of our network capabilities within the first 48 hours of the crisis, in a spirit of service and compassion, AT&T was able to direct its efforts to benefit its customers, other telecommunications competitors and their customers, first responders, and evacuees as needed. In this instance, we were largely able to use our in-place capabilities to meet not only our own needs, but also those of others. We put a variety of our facilities to work for other carriers and their customers, and continue to carry significant amounts of additional traffic for other carriers that cannot currently do so themselves. AT&T is also

helping to provide relief to those directly affected by the hurricane and flooding, and assistance to charitable relief activities.

Back at our offices, we continue to operate a War Room, which is focused on helping our customers get back on their feet and on providing and prioritizing services to business customers with special needs. For example, a business that has relocated out-of-state due to the hurricane and flooding requires rapid and professional deployment of numerous phone lines and data capability. This effort is part of our command and control structure.

Of course, the same is particularly true of our work with government customers like FEMA. In addition to immediately increasing FEMA call capacity and toll-free number availability, over the weekend of September 10th, AT&T was able to install an additional 140 T1 circuits to boost call center capacity to support FEMA. AT&T worked directly with the IRS to execute in less than 24 hours an agreement to direct calls using IRS trunks which IRS provided to give FEMA necessary increased call capacity.

At the same time, we coordinated with the NCC regarding the considerable resources that we could make available. First, we focused on the broader telecommunications network and the critical needs of first responders and ongoing rescue operations. In coordination with the NCC, we dispatched five Emergency Communications Vehicles (“ECVs”) with satellite capabilities, and other forms of assistance, to assist in the relief efforts. Never before had we deployed so many to a single area. During the first 13 days of the crisis, over 104,000 calls were made through AT&T ECVs. We assisted the Louisiana State Police, the Louisiana National Guard, Stennis International Airport, NASA and others, including civil emergency communications authorities in Mississippi and Louisiana.

- One ECV and other equipment were provided to NASA's Stennis Space Center in Mississippi, in a complex that hosts several Federal agencies, and which also became an evacuee center. By September 1, we were providing NASA with Internet connectivity and a phone bank, which has been used by shelter managers to make outgoing calls on behalf of area shelter residents.
- We provided diesel-powered generators to Louisiana State Police Troop L headquarters in Mandeville, LA on Saturday morning, September 3. They had lost their back-up power generator that morning. We offered an AT&T generator until its own could be repaired or commercial power restored.
- We deployed satellite communications capabilities through an ECV at a National Guard staging and billeting center at the Alario Sports Center in Westwego, LA, a few miles southwest of downtown New Orleans. We provided phone lines and Internet connectivity for the command staff, which it did not otherwise have available. Separately, we also enabled troops there to communicate with their families and others.
- We deployed communications facilities, including an ECV with satellite communications, near the Loyola Bus Station in downtown New Orleans—the station had been converted into a holding location for prisoners. The service was provided for public and administrative use.
- On September 3rd, our restoration, repair, maintenance and clean-up efforts added an air wing as one of our helicopters and that of a vendor were put to use, partly to provide support and also to patrol seven of our own fiber routes in the area to ensure that the routes remained safely in place and unobstructed.
- Network operations provided several phones for use by a temporary air coordination tower at Stennis International Airport. This was crucial because this airport became a focal point of relief flights and related efforts.
- Network operations gave generators and fuel to BellSouth to enable some of their facilities to remain in operation. BellSouth continues to use some of our generators.

The second part of our response was to provide relief to individuals, telecommunications services in support of charitable work, and to make our own charitable contributions.

- Working with Avaya, Cisco and SBC, we helped establish a communications network for evacuees at the Astrodome, including more than 1000 phone lines as well as data infrastructure.
- We established a phone bank to assist displaced college students to find alternative educational opportunities.
- We provided toll free calling and 10 call centers for a successful fundraiser: “Shelter from the Storm: A Concert for the Gulf Coast.”
- We are not billing any local or long-distance residential customers in southern Mississippi and the greater New Orleans area unless the customer originated home long-distance usage after September 1. This includes waiver of fixed monthly fees. We have also stopped all outbound bill collection efforts in Louisiana, Mississippi and Alabama.
- We are also helping our business customers get back in business by restoring services at damaged sites and augmenting their capabilities at new locations. We are waiving recurring and non-recurring charges at affected sites until businesses can re-establish operations.
- The AT&T Foundation also pitched in to address the needs created by this disaster. It donated \$1.5 million¹ and 148 laptops to the Red Cross for relief efforts. It issued 35,000 pre-paid calling cards for distribution to survivors and evacuees.

¹ This figure includes \$500,000 in matching funds for donations from AT&T employees.

IV. LESSONS LEARNED

Each emergency situation presents its own unique set of challenges, and even the most thorough planning cannot take the place of ingenuity and resourcefulness when the unforeseen happens. That said, much can be anticipated and we must plan and drill to address a variety of events on any scale. I am sure I join all of you in saluting our first responders and relief workers in their tireless efforts on the ground. But the importance of resourcefulness does not in any way obviate the need for very carefully thought out emergency planning led by seasoned professionals. In this respect, we believe that Katrina has taught us several lessons which we all must incorporate into future planning:

- **Establish and Practice Disaster Recovery Processes in Anticipation of Emergencies: Communications, Command and Control.** Communications resources can be brought where needed very quickly, but it is essential that there be clear lines of command and control at all times in order to direct those resources effectively and to the area of greatest need. Moreover, if because of the scale or nature of the disaster, some aspect of the plan affecting the command structure is not workable, an alternative must also be part of the plan and ready for implementation. Finally, without practice and drilling, no team will be ready and no plan will be ready to implement.
- **Internalize the 3P Paradigm: Preventative Action, Proactive Focus, Predictive Models.** It is crucial to invest in facilities and plan and drill regularly and thoroughly for a wide variety of contingencies. Investment cannot be deferred and possible scenarios ignored. We cannot wait for a disaster to occur before we are prepared to move aggressively.
- **Pre-Position Physical Resources at Optimal Locations for Fast Response – Sheltered and Above Sea Level.** This lesson certainly seems obvious now, but the fact remains that it was not always easy to do or done in New Orleans in a variety of different industries -- telecommunications included. One strength of our response to Katrina was

moving resources into the area quickly. Because we are a national corporation that created mobile resources to be deployed wherever needed, we are able to move our emergency resources far enough from at-risk areas to be out of harm's way, but close enough to be deployed quickly into affected areas.

- **Make Risk Analysis Routine: Harden Critical Infrastructure Where Indicated.** It is imperative to know what part of your infrastructure is critical to continued operation of the network in times of crisis and how to harden it as much as possible and to replace or restore it to the extent it may be damaged. Such analysis must be part of any risk assessment, and the assessment must be followed promptly by action.
- **Design Wireless Hubs for Worst-Case Scenario.** Wireless services in the Gulf Coast area suffered in Katrina's wake because of several perils. Some towers were simply blown over in the storm; others were knocked out due to flooding of the electronics at the base. Remaining towers were overloaded with rerouted traffic. Better planning for disastrous events is necessary and hardening and redundancy are crucial.
- **Establish Crisis Management Plan.** Every emergency situation is different, and even the best planning may not prevent things from going wrong. Thus, we need to prepare ourselves for that eventuality. Crisis management plans must recognize and allow for improvisation to adapt to the given circumstances.
- **Coordinate Restoration and Recovery Effort.** There should be no wasted effort in recovery operations. Everyone available should be participating, and there needs to be coordination so that efforts are not duplicated or in conflict with one another. The NCC and NCS played very positive roles in matching available resources to pending needs, and the FCC stepped in with leadership and authority as a clearinghouse for telecommunications recovery needs. It is essential that logistical information such as what roads are closed and what medical precautions need to be taken be readily available. Moreover, a recommendation we made after 9/11 still has not been implemented—companies who are crucial to the response to disasters such as AT&T should have special credentials designed for employees and accredited in advance in order to access disaster

areas—AT&T employees only were able to respond and move mobile resources into the Gulf Coast area by virtue of their resourcefulness in talking their way into affected areas.

- **Design Five 9's of Reliability.** This storm again confirmed that telecommunications companies that design their networks to this standard – 99.999% reliability – have excellent disaster recovery and response capabilities, as well as reasonably hardened networks. That is the only way to maintain this standard. In times of crisis, this capability becomes a vital national asset.
- **Interoperability and Spectrum Availability.** A crisis on the scale we saw in the Gulf Coast, and smaller challenges as well, demand a well coordinated information and communications delivery system. We must resolve the spectrum needs highlighted by the 9/11 Commission, among others, to provide first responders and others with a better and more effective means of communicating quickly and easily in an emergency.

IV. POLICY RECOMMENDATIONS

These lessons learned lead to several specific policy recommendations. These include:

- Make additional spectrum available for public safety purposes, and ensure that all first responders can access it in a coordinated and interconnected fashion.
- Furnish standardized and approved emergency credentials to vital communications and other infrastructure providers in advance, so that AT&T and other specialized disaster staff can get into affected areas to restore vital capabilities without delay or interference. While our teams were given letters from state officials authorizing them to enter impacted areas, those were not necessarily recognized by security and other personnel in the field.
- Predetermine security needs for law enforcement deployment to protect critical infrastructure facilities immediately following a disaster.

- Establish and routinely exercise mechanisms for improved public/private coordination, communication, and leadership across all essential disciplines. In this emergency, many of the challenges were operational, not technical. For example, we needed testing of the air and water to assess the risks to our teams, advice on medical precautions that should be taken given the flooding and fires, crucial logistical information such as notice of road closings, flyover authority, and overnight accommodations for our technicians (who slept in trucks because military bases were closed to them). Better communication and coordination across the range of public and private responders would improve operations.
- Drill for emergencies under various different scenarios frequently and include the public and private sector. Do not be satisfied with a written plan. Resolve all command and control issues.
- Consider subsidizing some emergency preparation by infrastructure companies since the government is likely to call such capabilities into use or would otherwise need to duplicate resources inefficiently.

We can never anticipate every contingency in an emergency, nor can we assure a foolproof communications network all the time under all circumstances. Nonetheless, at AT&T, we have done much to ensure reliability and restorability of communications networks and together – as an industry and as a nation – we can do more. I thank you for holding this hearing to advance this important discussion.

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