

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Reliability and Continuity of)	PS Docket No. 11-60
Communications Networks, Including)	
Broadband Technologies)	
)	

COMMENTS OF VERIZON AND VERIZON WIRELESS

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SUMMARY

The “Derecho” storm of June 29, 2012 caused widespread commercial power outages in the Washington D.C., Virginia and Maryland area, and widespread damage to Verizon’s wireline and wireless networks. Immediately after service was restored, senior Verizon management ordered an analysis of the 911 outages that occurred in Northern Virginia. As a result of the analysis, Verizon has identified several areas for improvement in its network reliability practices. Verizon is committed to implementing these changes expeditiously and has already taken several significant measures to address the lessons learned from the Derecho, including:

- Commencing a reassessment and redesign of Verizon’s wireline telemetry system, and prioritization of maintaining or restoring telemetry functions during outages;
- Implementing additional safeguards to further mitigate the potential impact of commercial power loss on its networks and services, including audits of backup power system for mission-critical facilities and new procedures to improve recognition and correction of backup power problems by Verizon employees;
- With 911 Center (PSAP) customers, considering measures to incorporate even more redundancy into the 911 network, including for automatic location information (ALI) services; and
- Jointly with the PSAPs affected by the 911 outages, developing additional procedures to enhance Verizon’s methods of communicating with PSAPs and the public during outage events so that stakeholders are better informed of the extent of outages and the status of restoration efforts.

The Commission should focus on how best to improve network reliability going forward by employing its iterative, successful approach of promoting the development of industry best practices. Verizon’s and other carriers’ experience in the Derecho, and the corrective actions Verizon has already initiated, present an appropriate opportunity to consider whether additional or modified best practices are warranted. The Commission thus should direct the existing Communications Security, Reliability and Interoperability Council (CSRIC) to evaluate existing and proposed best practices concerning network monitoring, backup power, network diversity

and redundancy, and communications to PSAPs, and determine whether modified or additional best practices are warranted in light of the lessons learned from the Derecho. Such an approach will continue to result in meaningful ongoing improvements in the reliability of communications networks, while affording service providers the flexibility to incorporate reliability considerations in a manner that most effectively protects their networks and customers.

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On June 29, 2012, a severe storm hit the Mid-Atlantic region with unusually intense straight-line winds. This “Derecho” storm caused widespread commercial power outages in the Washington D.C., Virginia and Maryland area, and widespread damage to Verizon’s wireline and wireless networks. The Derecho downed more poles and generated more business trouble tickets for Verizon than Hurricane Irene in 2011.² It caused cell site outages for Verizon Wireless’ networks throughout those states and into Ohio and West Virginia. Nevertheless, the network diversity and redundancy built into Verizon’s wireline and wireless networks, and the resources committed to service maintenance and restoration, either prevented the overwhelming number of

¹ In addition to Verizon Wireless, the Verizon companies participating in this filing are the regulated, wholly owned subsidiaries of Verizon Communications Inc. (together “Verizon”).

² In its report on the impact of the Derecho on commercial power service, the U.S. Department of Energy observed that there was little advance warning of the storm, it left more customers without power in the region than Hurricane Irene, and dwarfed other recent commercial power outages resulting from other major storms in the region, including Hurricane Ike in 2008. *See* U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, *A Review of Power Outages and Restoration Following the June 2012 Derecho*, at 2-3, 9 (Aug. 2012), available at <http://energy.gov/oe/downloads/review-power-outages-and-restoration-following-june-2012-derecho>; *see also id.* at 6 (explaining that the Derecho’s wind gusts exceeded a category 1 hurricane’s sustained wind speeds, but “hurricanes and tropical storms typically deliver the most severe wind speeds to coastal areas, and lose considerable strength as they move inland.”).

customers from losing service in the first instance, or enabled Verizon to trouble-shoot and remedy the causes of outages and restore service.

In a few important cases, however, the storm's impact had unforeseen cascading effects within the wireline network, including to the 911 services and facilities provided to certain Public Safety Answering Point (PSAP) customers and to end users in Northern Virginia. Immediately after services were restored to customers, Verizon initiated a comprehensive analysis of the storm's impact throughout its service territories and already is updating and enhancing its practices as a result of that analysis. These comments in response to the Commission's Public Notice³ reflect the results of that analysis to date. The Commission should promptly direct its Communications Security, Reliability and Interoperability Council (the "CSRIC") to consider what Verizon and other stakeholders have learned from the Derecho and incorporate these lessons into the 911-related best practices already under development – and, if necessary, extend the CSRIC's charter to do so.

DISCUSSION

I. VERIZON IS IMPLEMENTING A NUMBER OF CORRECTIVE ACTIONS BASED ON ITS EXPERIENCE WITH THE DERECHO.

Verizon's rigorous network resiliency and service restoration practices largely worked as designed throughout most of the area affected by the Derecho. At two wireline locations in Northern Virginia, however, following the loss of commercial power, one of two backup generators at each location failed to start, which began a chain of events that ultimately impacted hundreds of network transport systems and caused Verizon to lose much of its visibility into its

³ See *Public Safety and Homeland Security Bureau Seeks Comment on 9-1-1 Resiliency and Reliability in Wake of June 29, 2012 Derecho Storm in Central, Mid-Atlantic, and Northeastern United States*, Public Notice, PS Docket No. 11-60, DA 12-1153 (PSHSB rel. July 18, 2012) ("*Notice*").

network for the area. Following is a description of how Verizon's wireless and wireline networks and customers were affected by the storm, which includes information from the attached analysis of the 911 service outages.⁴

Wireless. The loss of commercial power directly affected power for operating cell sites and a limited number of mobile switching centers (MSCs) and, in many instances, backhaul connections between cell sites and MSCs. At the height of the storm several dozen sites were out of service, principally due to the loss of power for backhaul (wireline) transport.⁵ Significantly, no MSCs were out of service or isolated during the event and most cell sites remained operational due to the availability of backup power. Even at the height of the storm's impact, Verizon Wireless maintained over 90 percent of its historical capacity. Backup batteries and generators generally performed as expected; while a limited number of generators did not (16 out of 976 – less than 2 percent of the generators in the affected area), those incidents were timely remedied as a matter of course as part of system restoration efforts. Verizon Wireless was able to timely respond to cell site outages and restore service as commercial power was restored.

Wireline. For the wireline network, power failures resulting from the Derecho affected more than 100 Verizon locations, but batteries and back-up generators and monitoring (telemetry) systems worked as designed at nearly all locations, allowing Verizon to maintain or quickly restart critical services.⁶ Given the severity of the storm and the cascading impact of the loss of power, however, Verizon's wireline network lost service at a number of points throughout

⁴ See Attachment 1, Verizon, *911 Service and the June 20, 2012, Derecho*, released Aug. 13, 2012 ("Derecho 911 Service Analysis").

⁵ Verizon Wireless has provided detailed outage information relating to cell sites via the Commission's Network Outage Reporting System ("NORS").

⁶ Across the impacted area, nine generators failed to operate properly out of 136 in total.

its network, including local switching, local transport, global transport, and physically damaged cables and poles.⁷ Verizon also lost the systems that enable it to monitor the condition of many network facilities in that area. This loss of visibility, in turn, hindered Verizon's initial efforts to assess and repair damages. That is to say, once Verizon lost visibility into its network, it could not see where the problems were, and thus it took longer to fix them.

Verizon's wireline network also serves over 200 PSAPs that were in the storm's path. In the vast majority of cases, the systems performed as designed in serving those PSAPs. But, as explained in more detail in the attached post-storm analysis, the failure of two back-up generators to start – one at each of the Arlington and Fairfax central offices – combined with damage to transport systems to cause a loss of service to four PSAPs, as well as commercial service disruption.⁸ In addition, a number of area PSAPs (including those four) faced other 911-related problems, primarily a lack of delivery of automatic location information (ALI) on 911 calls due to the loss of local transport and loss of administrative and backup phone lines.⁹

Post-Derecho Actions. Verizon recently completed the attached post-storm analysis of the storm's impact on the wireline 911 network,¹⁰ which was initiated almost immediately after services were restored. The analysis details Verizon's assessment of the storm's impact on 911 services and the actions Verizon has already initiated to address those issues, the more significant of which are discussed below.

⁷ See Notice at 3 (asking “[w]hich network elements and components” suffered outages and the duration of those outages). Verizon has separately provided detailed information concerning the network elements and components that were out of service and the duration via NORS.

⁸ Derecho 911 Service Analysis at 2-4.

⁹ See Notice at 4 (seeking comment on impact of storm on ALI).

¹⁰ See Attachment 1.

Verizon has begun a reassessment and redesign of its telemetry system in light of its experiences in the storm. This redesign is intended to provide more diverse connections and alternate (backup) locations, in the event of a problem at a location where telemetry functions ordinarily occur. Verizon is also instituting automated controls to give higher priority to maintaining or restoring the telemetry functions when generator problems arise so that monitoring can continue in those circumstances.¹¹

Verizon also is implementing additional steps to further mitigate the potential impact of commercial power loss on its networks and services. These measures include audits of backup power systems for mission-critical facilities supporting 911 and taking necessary corrective actions to address issues identified in those audits. Verizon is enhancing emergency practices and procedures to improve service restoration procedures, including development of procedures to: (1) enable any employee to determine if there is a loss of power to an area of the building so that outages can be recognized earlier, and (2) improve manual generator start and transfer procedures so that more employees are familiar with emergency procedures and generator system design and can help facilitate manually starting generators if they do not start automatically. Verizon also will expand its testing procedures even further, including ensuring that testing includes “failed automated controls” and “prioritized system load transfer” scenarios. And Verizon has modified its processes for mobilizing personnel and initiating emergency procedures so that service restoration procedures and resources are utilized more quickly when backup power batteries are activated or telemetry is lost.¹²

¹¹ *See Notice* at 6 (inquiring about the adequacy of “standard operating procedures and systems ... the service provider ha[s] in place to facilitate the detection and restoration of 9-1-1 service after an outage”); *Derecho 911 Service Analysis* at 5.

¹² *See Derecho 911 Service Analysis* at 5.

In addition, Verizon is considering measures to incorporate even more redundancy into its 911 network. Verizon already maintains highly redundant and diverse 911 facilities which enabled Verizon to route 911 calls away from isolated PSAPs to functioning PSAPs after the Derecho, thereby mitigating the impact of the loss of service. Nonetheless, Verizon's analysis of the network impacts of the Derecho has identified areas of improvement on diversity, notably for ALI diversity in some specific PSAP configurations. Verizon will work directly with its individual PSAP partners on potential improvements in that regard.¹³

Finally, Verizon has initiated efforts to supplement its already extensive methods of communicating with PSAPs during outage events. Verizon's existing processes generally worked during the Derecho, and Verizon stayed in constant communications with PSAPs during the 911 outages. However, once the telemetry capabilities were lost, Verizon and, thus, the PSAPs lost access to outage-specific information they needed, including access to automatic notifications that ceased when alarms stopped working.¹⁴ As discussed above, Verizon is working to improve its systems and procedures to maintain its visibility into the network, which will improve the usefulness of communications to PSAPs in the face of catastrophic failures.¹⁵

¹³ *See id.* at 5. The details of such arrangements are proprietary and raise potential security considerations, and thus need to be considered directly with individual PSAP customers.

¹⁴ *Id.* at 6.

¹⁵ The Derecho 911 Service Analysis explains further that:

As an example of how the lack of network visibility hindered communications, certain PSAPs, when they were no longer receiving 911 calls the morning after the storm, activated "network controls" to re-route calls through different paths or to a pre-designated alternate location. Verizon has since determined that certain of these PSAPs would have been better off not doing so (i.e., they would have started receiving 911 calls earlier if they had not re-routed calls through different paths), but without the appropriate information, they were unable to make that determination at the time.

Id. at 6-7.

This, in turn, will enable PSAP customers to accurately and timely report the status of 911 services to their constituents. In addition, the 911 directors of the City of Alexandria, and the Counties of Arlington, Fairfax, Loudoun, Prince William and Stafford have recommended that Verizon adopt a number of constructive communications-focused measures, including: application of the National Incident Management System (NIMS) processes for incidents affecting 911 service; broadcast text based transmissions of incident-specific information to designated PSAP personnel; periodic drills and exercises with the area PSAPs; and standardized maintenance and distribution of Verizon contact information, including executive level personnel; and participation in the jurisdictions' Emergency Operations Center activities. Verizon will work with those agencies to implement those concepts.¹⁶ Verizon also intends to share additional information with subscribers and media outlets about the status of restoration efforts more quickly.¹⁷

II. THE CSRIC SHOULD EXAMINE VERIZON'S AND OTHER SERVICE PROVIDERS' DERECHO EXPERIENCE TO DETERMINE WHETHER AND HOW TO UPDATE INDUSTRY BEST PRACTICES.

Verizon's strong commitment to disaster preparedness and industry best practices¹⁸ was instrumental in protecting the reliability of its networks throughout most of the wide geographic area affected by the Derecho. The Derecho nevertheless revealed several areas for improvement. To that end, Verizon recommends that the Commission task the existing CSRIC Working Group 8 with the responsibility of incorporating Verizon's and other service providers' Derecho experiences into its forthcoming recommendations, including the specific matters Verizon

¹⁶ *Id.* at 7-9.

¹⁷ *Id.* at 9.

¹⁸ *Notice* at 3 (seeking comment on whether there are "industry best practices that address these, and any other, contributing causes" and the extent to which such practices were followed).

recommends below.¹⁹ Given the importance of this matter, the Commission should extend the scope of the CSRIC's charter beyond March 2013, if necessary.²⁰ The current CSRIC provides a wealth of experience and expertise that is already looking into related issues,²¹ and the Commission should not allow the CSRIC charter to terminate without availing itself of those subject matter experts.²²

Network Monitoring. Verizon maintains several Network Operations Centers (NOCs) that monitor critical network facilities, including transmission facilities, switches, and cell sites across Verizon's networks.²³ The NOCs are staffed 24 hours a day, seven days a week, every day, with experienced personnel who work closely with regional and local field operations teams. With respect to 911 services, Verizon's telemetry systems provide comprehensive visibility into the 911 network and timely status of failures in the 911 network that enable

¹⁹ *Notice* at 4 (seeking comment on specific steps the Commission should take).

²⁰ The Commission took similar action in the wake of the August 2011 East Coast Earthquake by tasking the CSRIC with developing recommendations on the prioritization of 911 calls during high volume calling events. *See* Letter from Chairman Genachowski to CSRIC Members, dated Sept. 23, 2011, available at <http://transition.fcc.gov/pshs/advisory/csric3/CSRIC%20Meeting%20Chairman%27s%20Letter.pdf>.

²¹ *See* CSRIC III, Working Group Descriptions and Leadership, at 7-8 (updated Aug. 1, 2012), available at <http://transition.fcc.gov/pshs/advisory/csric3/wg-descriptions.pdf> (describing Working Group 8's responsibilities).

²² Availing itself of the CSRIC's resources here would be consistent with the Commission's commitment to the President's deregulatory retrospective analysis which, as OMB explains, "acknowledge[] the importance of considering flexible approaches and alternatives to mandates, prohibitions, and command-and-control regulation." *See* Memorandum for the Heads of Executive Departments and Agencies, and of Independent Regulatory Agencies, Cass R. Sunstein, Administrator, OMB Office of Information and Regulatory Affairs, Feb. 2, 2011, at 3. <http://www.whitehouse.gov/sites/default/files/omb/memoranda/2011/m11-10.pdf>; Exec. Order No. 13579, 76 Fed. Reg. 41587 (July 14, 2011); *see also* Exec. Order No. 13563, 76 Fed. Reg. 3821 (Jan. 18, 2011).

²³ *See Notice* at 4-5 (seeking comment on service providers' monitoring systems for 911 systems and other assets).

Verizon to notify its PSAP customers of problems as a matter of course and respond promptly to restore service.²⁴ Verizon’s system of NOCs and other network monitoring capabilities illustrates its commitment to meeting industry best practices.²⁵ Verizon’s findings regarding the impact of the loss of commercial and backup power on Verizon’s monitoring systems, and the corrective actions it has initiated, nevertheless could prove relevant to other 911 service providers and be the basis for new or modified best practices. The Commission thus should direct the CSRIC to consider whether it is appropriate to further develop modified or expanded best practices for network monitoring.

Backup Power. Verizon has invested in substantial backup power resources, whether batteries or generators, to minimize the impact of commercial power outages on customers. All of Verizon’s central offices have been engineered to have both battery reserves and generators (mostly on-site, some portable) with at least 24-hour and up to 72-hour fuel reserves – three times longer than the period the Commission’s original backup power rules required. Verizon deploys a combination of batteries and generators to support critical operations during commercial power failure. The batteries provide an immediate source of power following the loss of commercial power until the generators go online (which is designed to occur automatically), and then the batteries act as the back-up power source should the generators fail. Similarly, all of Verizon’s remote switches and Digital Loop Carriers (DLCs) have batteries

²⁴ *See id.* at 5 (asking “[h]ow quickly ... service providers become aware of 9-1-1 failures of various kinds”).

²⁵ NRIC Best Practice 8-7-0401 for “Network Surveillance” provides that “Network Operators and Service Providers should monitor their network to enable quick response to network issues.” NRIC Best Practice 8-7-0417 titled “Capacity Management” also provides that “Network Operators should design and implement procedures to evaluate failure and emergency conditions affecting network capacity.” NRIC Best Practices are available at <https://www.fcc.gov/nors/outage/bestpractice/BestPractice.cfm>.

designed to an eight hour engineering standard and/or on-site generators capable of providing at least eight hours of power. Nearly all of Verizon Wireless' cell sites (including on-site backhaul equipment) are designed with eight hours of backup power, as well. Verizon also maintains rigorous practices and procedures for the maintenance of its backup power resources. For example, Verizon checks its central office power sources on a monthly basis. Power sources at Verizon Wireless' cell sites are also maintained on a routine scheduled basis.

The industry already has developed many important best practices for backup power. For example, NRIC Best Practice 8-7-5204 provides that:

Service Providers, Network Operators and Property Managers should ensure availability of emergency/backup power (e.g., batteries, generators, fuel cells) to maintain critical communications services during times of commercial power failures, including natural and manmade occurrences (e.g., earthquakes, floods, fires, power brown/black outs, terrorism). The emergency/backup power generators should be located onsite, when appropriate.

NRIC Best Practices 8-7-0492 and 0493 similarly call for “back-up power (e.g., some combination of batteries, generator, fuel cells) at cell sites and remote equipment locations, consistent with the site specific constraints, criticality of the site, the expected load and reliability of primary power” and to “consider placing fixed power generators at cell sites, where feasible.” The same degree of backup power should be provided for on-site backhaul equipment as well.²⁶ Verizon's own practices reflect these and other best practices, which contribute substantially to the reliability of its network. And Verizon already has begun incorporating the lessons learned from the Derecho into its backup power practices.

²⁶ See NRIC Best Practice 8-7-0499 (“Network Operators and Service Providers should consider ensuring that the back-haul facility equipment located at the cell site is provided with backup power duration is equal to that provided for the other equipment at the cell site.”).

Given the importance of 911 services to public safety, the *Notice* appropriately asks a number of questions on how “to improve the ability of communications assets to operate longer when commercial power is lost” including whether the Commission should take any particular action.²⁷ Verizon’s incorporation of backup power best practices into its networks was critical to its ability to maintain service throughout most of the area affected by the Derecho. As described above and in the attached post-storm analysis, however, starting failures with one of two back-up generators at each of two central offices in Northern Virginia played a critical role in the commercial service and 911 outages that occurred after the storm.²⁸ The cascading, daisy-chain impact of these failures on the network underscores that the answers will be complex – as evidenced by the loss of commercial and backup power on Verizon’s comprehensive telemetry system which, in turn, undermined the effectiveness of its otherwise robust maintenance, monitoring and restoration practices. Given the complexities involved, Verizon recommends that the Commission task the CSRIC with reevaluating these and other best practices that relate to commercial power. Other stakeholders should be consulted as well, including PSAPs and utility companies.

911 Facilities Diversity/Redundancy. There are numerous best practices for network resiliency and redundancy that Verizon incorporates into its own practices, including for 911 systems.²⁹ NRIC Best Practices 8-7-0402, 8-7-0546 and 8-7-0566, among others, address the

²⁷ See *Notice* at 4.

²⁸ See *id.* at 4.

²⁹ While Verizon’s comments focus on redundancy and diversity in its wireline 911 network, wireless carriers like Verizon Wireless also generally maintain dedicated 911 facilities from their MSCs to the LEC-provisioned tandems. As a general rule, Verizon Wireless deploys two separate DS1s into each 911 selective router for redundancy purposes. Each DS1, in turn, is diversely routed. As PSAPs upgrade their networks to IP-based platforms in migrating to an NG911 environment, Verizon Wireless expects to continue this practice for NG911 points of

issue of “Single Points of Failure” and diversity in 911 networks. Several other existing best practices also address the importance of diversity and redundancy for critical facilities.

Verizon’s 911 networks reflect these practices, as they are deployed with redundant key components, such as mated selective routers, End Office Trunk Groups to each selective routers, diversified facilities to the extent possible, and geo-diverse ALI platforms. Verizon has worked closely with its PSAP customers over the years to develop and deploy diverse, redundant 911 networks capable of withstanding natural disasters and other catastrophic events in a manner that both is consistent with industry best practices and meets customers’ demands.

The attached “E911 Design” document illustrates the degree of network redundancy reflected in the wireline 911 systems adversely affected by the Derecho.³⁰ Verizon’s 911 system design provides multiple diversities or redundancies “inside the network.” There are multiple tandem offices providing routing, so that if one fails, the calls to the failed office are routed through the other(s). Verizon’s ALI databases and links to each ALI database are redundant, as are Verizon’s signaling systems which route calls to their destinations. The connections from the CO to Verizon’s PSAP partners are diversely designed, running over multiple trunks and/or over multiple paths.³¹ All of these methods promote 911 reliability, and Verizon has adopted them as a matter of standard business practice to ensure they are followed routinely and remain in place over time.³² Nevertheless, given Verizon’s experience in the Derecho with the loss of transport

interconnection that depart from the traditional LEC-provisioned selective router 911 network configuration.

³⁰ *See* Attachment 2.

³¹ *See Notice* at 4 (seeking comment on how the storm affected network interconnection, the degree of redundancy in interconnection).

³² *See id.* at 5.

facilities, including for ALI, Verizon recommends the CSRIC examine these best practices as well.³³

PSAP Communications Methods. Verizon has closely integrated its monitoring and telemetry systems and its PSAP communications methods to ensure that PSAPs are timely apprised of system failures. Over the past few years, Verizon has established robust processes to communicate with PSAPs during an emergency or system failure, particularly during focused overload (also known as “mass calling”) situations, including establishing a team entirely dedicated to communicating with PSAPs. These processes include automatic notifications to PSAPs when certain alarms are triggered and are fully consistent with best practices.

Based on its experience in the Derecho, Verizon has initiated a number of additional measures to supplement these existing processes, including several requested by the PSAPs affected by the Derecho. The Commission should have the CSRIC examine whether to incorporate these processes into industry best practices. Several of the CSRIC’s most recently adopted recommendations on PSAP communications may address some of these issues as well.³⁴ Verizon’s Derecho experience and its efforts to improve PSAP communications should inform the CSRIC’s evaluation of whether additional best practices are warranted to ensure that 911 service providers and PSAPs communicate effectively during outages.

³³ *See id.* at 4 (“To what extent do industry best practices exist that relate to these events, and were these best practices followed?”). These NRIC Best Practices include: 8-7-0546 (minimize single points of failure in critical paths), 8-7-0568 (use of alternate PSAPs), 8-7-0571 (dual selective router architectures and diversity in supporting interoffice transport), and 8-7-0651 (diverse power supplies).

³⁴ *See* Presentation of Working Group 8 – E9-1-1 Best Practices, CSRIC III, dated June 6, 2012, available at <http://www.fcc.gov/pshs/advisory/csr3/8-WG%20Presentation%206-6-12.ppt>. The CSRIC adopted Working Group 8 recommendations concerning, among other things, prioritization and restoration of 911 service and communications with PSAPs in business continuity plans.

III. THE DEVELOPMENT OF NEW OR MODIFIED BEST PRACTICES THROUGH THE CSRIC REMAINS THE APPROPRIATE METHOD OF IMPROVING NETWORK RELIABILITY.

As the Commission has acknowledged, network reliability best practices have evolved in a manner that accommodates flexibility in implementation while promoting meaningful improvements over time. The lessons of the Derecho call for that same balanced and iterative approach to promoting network reliability – the process of reporting and “learn[ing] from each other’s operational experiences” that has successfully “created an environment . . . that has fostered reliability in telephone networks even as the number of competitive, interconnected networks has increased throughout the United States.”³⁵ Significant weather events such as the Derecho and other natural disasters often bring unforeseen issues to the fore and reveal potential areas for improvement in networks and operations that cause industry and other stakeholders to revisit best practices, and the measures that they have undertaken to implement them, to see if changes in those practices are warranted.

Because of the collaborative, non-adversarial and data-oriented nature of this process, service providers have actively and voluntarily participated in the development of best practices and incorporated them into their own practices over time. As the Commission has explained:

[T]his is a dynamic process in which continuing best practices development, and refinements, are driven by the provision of required data which validate or disprove conclusions contained in the then-existing best practices. New best practices developed through this process are, in turn, validated or modified as new network outage data become available.³⁶

Hurricane Katrina, for example, resulted in the development of many additional best practices that Verizon has implemented. More recently, Verizon worked collaboratively with the

³⁵ See *New Part 4 of the Commission’s Rules Concerning Disruptions to Communications*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd. 16830, ¶ 15 (2004).

³⁶ *Id.* ¶ 15 n.26.

Commission, state regulators and standards bodies to develop best practices and industry standards to modify processes related to certain PSAP 911 trunking facilities.³⁷

Because of the necessarily iterative nature of this process, best practices, by design, cannot be readily translated into prescriptive rules. The Commission's response to the Derecho should be no exception and should focus on how best to improve industry best practices going forward. Indeed, Verizon's efforts demonstrate how service provider practices naturally evolve to improve network reliability on an ongoing basis, consistent with the Commission's existing framework.³⁸ Verizon and other carriers have filed data with the Commission via the NORS and Disaster Information Reporting System-Lite (DIRS-Lite) systems which provide considerable detail concerning the storm's impact on individual network components. Verizon continues to supplement these reports as additional information becomes available. It has worked aggressively to analyze the root causes of the outages, and has already taken actions to address those findings that will further improve the resiliency of its communications infrastructure for similar events. The Commission can most effectively utilize this data and the lessons learned from the Derecho by directing the CSRIC to modify or develop new best practices.³⁹

³⁷ See Notice at 5 (seeking comment “on how 9-1-1 communications has fared during other recent natural disaster events” and “lessons learned from those events); NRSC 9-1-1 CAMA Trunk Throughput Optimization Analysis” (ATIS-0100034) available at http://www.atis.org/legal/Docs/NRSC/CAMATrunk_Transmittal_Final.pdf.

³⁸ See Notice at 4 (seeking comment on actions service providers, PSAPs, and the Commission can undertake to improve the reliability of the 911 network and the restoration of service to account for events such as the Derecho).

³⁹ See *id.* at 3-4 (asking what can be done to “improve the resiliency of communications infrastructure in the face of physical damage like what was seen during the storm,” the actions “the communications industry can take to avoid or mitigate these outages in future similar events” and how “to better prepare for events like this in the future.”).

Backup power methods illustrate how best practices do not readily translate into prescriptive regulations. Verizon's wireline and wireless businesses each maintain tens of thousands of assets, such as cell sites, switches, and DLCs that would have been subject to the Commission's previous backup power design and maintenance regulations. Mandating such requirements would impose enormous costs without tangible benefit in terms of network reliability. The generators that failed to start in Northern Virginia, for example, are already subject to a 72 hour backup power standard and routine maintenance schedule; backup power regulations would not have prevented undetected air in the fuel lines of one generator or a defect in the auto-start mechanisms of the other.⁴⁰ The affected cell sites each were designed with 8 hours of backup power, and the overwhelming number of wireless cell sites out of service after the storm lost service due to problems with backhaul links, not cell sites, and backup power resources are maintained on a standard schedule.⁴¹ Thus, it does not appear that the Commission's prior rules would have prevented the 911 or wireless outages here.

Best practices provide industry with the flexibility to respond to rapidly changing technologies and localized technical challenges, whereas prescriptive rules quickly become outdated and counterproductive. For wireless services, for example, certain cell sites are not designed with eight hours of backup power because of engineering design trade-offs that consider, among other things, how critical the site is for network coverage purposes, what equipment is installed at the site, neighboring site capacity and coverage overlap, availability of generator or other backup commercial power, and environmental (e.g., space, weight, ventilation, landlord) concerns. These factors will become increasingly acute as wireless service providers

⁴⁰ See Derecho 911 Service Analysis at 4.

⁴¹ See 47 C.F.R. § 12.2(a) (2008) (back-up power rules).

begin deploying “small cell” systems that would make compliance with a backup power mandate even more challenging, and might well be technically infeasible in challenging environments such as indoor or stadium-like venues. The Commission’s own Technological Advisory Council has recommended that the agency encourage the deployment of such technologies in order to promote wireless broadband services,⁴² yet a burdensome backup power mandate that applies inflexibly to such innovative technologies could work to the detriment of consumers and the Commission’s policy goals. In contrast, a best practices regime enables these factors to be weighed and balanced, while not impeding the expansion of wireless services for consumers.

Allocating backup power resources for wireline assets such as DLCs requires similar balancing considerations. Best practices enable Verizon to tailor its assessments to focus on those sites that serve the most customers or may be situated in areas more prone to disasters that require backup power. Further, many of the same environmental limitations relevant to wireless services are relevant to DLCs as well. Many sites are located in buildings or on property where space is extremely limited or structural loading issues exist, or where state and local regulatory restrictions such as zoning, building code, historic preservation, air quality and noise abatement can impact the feasibility of placing back-up power systems at a given site, limit the size of those systems or substantially delay their permitting and installation.

It is also critical that affected stakeholders, including service providers, PSAPs, and the Commission, be able to evaluate the relative merits of best practices holistically. Improvements in practices other than backup power sources, such as communications procedures with affected PSAP officials, or added redundancy, can potentially help mitigate the impact of commercial

⁴² See Technical Advisory Council Chairman’s Report at 3 (Apr. 22, 2011), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-306065A1.pdf.

power loss in a less burdensome manner. Compelling service providers to uniformly implement particular technical capabilities or configurations network-wide, such as minimum levels of backup power resources, would preclude service providers from making legitimate balancing judgments in this regard and result in the misallocation of capital resources. For this reason as well, the Commission should address service providers' backup power and other network reliability practices through the CSRIC.

Flexibility is also necessary to effectively implement best practices for 911 networks and services. Existing best practices furnish service providers with comprehensive guidance for resiliency and restoration of 911 networks, and are reflected in Verizon's own practices. Many of these services and facilities are provisioned for PSAPs as customers, and financed by taxpayers. Thus, in some instances, whether to implement the ideal reliability method will not entirely be the service provider's decision. Furthermore, service providers and many PSAPs are in the process of migrating their services to IP-enabled networks and equipment, and the routing configurations or maintenance practices that are most effective in a TDM/circuit-switched network may have little bearing in an NG911 environment.⁴³ Best practices that give service providers flexibility to implement safeguards that address a particular PSAP's or jurisdiction's concerns and resources are critical for these reasons as well.

⁴³ The Commission's Technological Advisory Council PSTN Successor Infrastructure Work Group has already been tasked with addressing some questions that are similar to those in the Notice, and that will have bearing on how service providers and other stakeholders address the transition to IP-enabled services and network, including the impact on network robustness, the need for backup power resources, and whether "additional capabilities are needed from the underlying broadband network to enable 911 or other emergency services functionality that is at least equivalent to that offered by the existing system?" See FCC TAC Document VI, Working Group Questions at 3, <http://transition.fcc.gov/bureaus/oet/tac/tacdocs/TAC-WG-Ques-5-9-12.pdf>.

IV. THE COMMISSION SHOULD FACILITATE DEPLOYMENT OF NEXT GENERATION 911 SYSTEMS AND CAPABILITIES BY ALL STAKEHOLDERS.

The Commission seeks comment on a number of issues concerning the implications of NG911 deployment on 911 system reliability. Verizon generally expects that the proposed NENA i3 NG911 architecture, if implemented as designed, could provide an overall increase in 911 system reliability.⁴⁴ The i3 architecture contemplates that all critical components would be deployed with no single point of failure, and that services are provided in a manner to survive disaster, deliberate attack and massive failure – which would require a redundant and geographically diverse design for all critical ESInet components. Moreover, full NG911 is dependent upon end-to-end IP communications, which has the capability to dynamically reroute traffic and improve redundancy. Additionally, the policy routing function within the ESInet Emergency Services Routing Proxy enables multiple dynamic re-routing possibilities to established back-up PSAPs. The i3 architecture would also allow for the implementation of virtual PSAPs, although methods and procedures and potentially PSAP-specific applications (e.g. for recording, call transfer, access to ALI, additional data, etc.) would be necessary.⁴⁵

⁴⁴ See NENA 08-003 – “Detailed Functional and Interface Standards for the NENA i3 Solution.” Further, NENA has published a network Information Document (NID) that provides specific guidelines for the design of ESInets that includes Redundancy, Quality of Service, and Reliability Guidelines. See NENA 08-506 – “Emergency Services IP Network Design for NG9-1-1.” Important security considerations are contained in NENA 75-001 – “Security for Next-Generation 9-1-1.” NENA standards and information documents are available at <http://www.nena.org/?page=Standards>.

⁴⁵ NENA 53-507– “Virtual PSAP Management” specifies necessary considerations PSAPs must address relative to employing virtual call-takers.

Verizon strongly supports a standards-based and efficient transition to NG911.⁴⁶ As service providers and PSAPs transition to NG911, recommendations for reliability and security should therefore be considered and incorporated into migration plans as appropriate.⁴⁷ The Commission should *not*, however, rely heavily on alternate legacy technologies such as SMS-to-911 as a substantial alternate mechanism of reaching 911 in emergencies.⁴⁸ Verizon remains committed to deploying an SMS-to-911 solution to capable PSAPs beginning late 2012 or early 2013 given the important public safety benefits and consumers' changing communications demands. SMS-to-911 solutions require more limited bandwidth than voice and, in some cases, may better enable a text message to reach a PSAP during high volume calling events.

As a general rule, however, Verizon expects that SMS-to-911 communications would be affected by outages to largely the same degree as voice 911 calls. The interim SMS-to-911 solutions currently under development all rely on existing radio, SMS and PSAP architecture. Thus, cell site outages would affect SMS-to-911 communications just as they would voice. Within the PSAP's facilities, insofar as an SMS-to-911 solution piggy-backs off of the existing PSAP platform, an outage of the PSAP's network would also necessarily affect SMS-to-911 traffic flowing over that network. Moreover, PSAPs may have limited SMS-to-911

⁴⁶ See Comments of Verizon and Verizon Wireless in PS Docket Nos. 11-153 and 10-255, filed Dec. 12, 2011, at 2-16.

⁴⁷ See, e.g., NENA 08-506 – “Emergency Services IP Network Design for NG9-1-1” and NENA 75-001- “Security for NG9-1-1.” NRIC Best Practice 8-8-0574 addresses many of these issues for IP-enabled NG911 networks. To address these issues, Verizon provides multiple alternate routing alternatives that the PSAP might use to provide the greatest chance for a 9-1-1 network call completion. Where Verizon is deploying ESInets it provides redundant connections over separate MPLS networks. See also NRIC Best Practices 8-6-0762 (redundant application layer services) and 8-6-0767 (SIP-signaled VoIP networks).

⁴⁸ See Notice at 6 (asking whether text-to-911 capability would “provide substantial improvement in the ability of consumers to contact PSAPs”).

“call-taking” capabilities and there is a broad consensus that users should be instructed to make a voice call to 911 if possible. The Commission should promote the transition to end-to-end IP-enabled NG911 services for these reasons as well.

CONCLUSION

The Commission should incorporate its findings about the Derecho’s impact on communications networks and services into its successful approach of fostering the development of additional or modified best practices through the CSRIC. Such an approach will afford service providers the flexibility to incorporate reliability considerations in a manner that most effectively protects their networks and customers.

Respectfully submitted,

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Attachment 1



**Verizon, 911 Service
and the June 29, 2012, Derecho**

August 13, 2012

Verizon, 911 Service, and the June 29, 2012 Derecho

Late in the evening of Friday June 29, 2012, a severe storm hit the Mid-Atlantic region with unusually intense straight-line winds. This “Derecho” caused widespread commercial power outages in the Washington D.C., Virginia and Maryland area, and widespread damage to Verizon’s networks. Indeed, the Derecho downed more poles and generated more commercial trouble tickets for Verizon than Hurricane Irene. External power failures affected more than 100 Verizon locations. At each of these locations, batteries and nearly all the back-up generators worked as designed, allowing us to continue service. However, at two of these locations, generators failed to start, disabling hundreds of network transport systems, and causing Verizon to lose much of its visibility into its network in the impacted area.¹

Verizon designs its network to provide 911 services even during disasters. As explained further below, our 911 network designs include multiple levels of diversity and redundancy, as well as back-up power in critical facilities, to optimize resiliency during a crisis. Nevertheless, generator failures caused a temporary loss of 911 service to four of the more than two hundred 911 centers (referred to as Public Safety Answering Points, or PSAPs) that Verizon serves across the storm’s path. As a result, three PSAPs (Fairfax County, Prince William County, and Manassas) did not receive 911 calls for several hours Saturday, June 30, and another (Manassas Park) did not receive 911 calls for much of that weekend. In addition, a number of area PSAPs (including those four) faced other 911-related problems, consisting primarily of a lack of delivery of location information on 911 calls and the loss of administrative and back-up phone

¹ Across the impacted area, more than 1,900 network transport systems were damaged and failed. A very significant percentage of those systems were in Arlington and Fairfax, where the two generators failing to start caused the 911 issues. Across the impacted area, nine generators failed to operate properly out of 136 in total.

lines.² This document describes Verizon’s final analysis of what happened and identifies important corrective actions to minimize the risk of future problems.

* * *

Two Generator Starting Failures Caused the 911 Outages

Our investigation has determined that the failure of one of two back-up generators to start at each of our Arlington and Fairfax central offices following the loss of commercial power caused the Northern Virginia 911 disruptions. Multiple failures cascading from these specific generator problems and damage to the transport network combined to cause the outages for the four PSAPs. Included among those failures were systems that enable us to monitor the condition of our network facilities in Northern Virginia, and that loss of visibility over our network hindered our initial efforts to assess and repair damages.

At critical facilities, Verizon deploys a combination of batteries and generators to support critical operations during a commercial power failure. The batteries provide an immediate source of power following the loss of commercial power until the generators go online (which is designed to occur automatically), and then the batteries act as the back-up power source should the generators fail.

At more than 100 locations, Verizon’s back-up batteries and generators worked as designed. However, one of two back-up generators did not start at each of the Fairfax and Arlington facilities, and these failures caused the four PSAPs’ 911 call completion problems.

² Location information, referred to as Automatic Location Identifier (“ALI”) information, automatically provides the PSAP with the address of 911 callers using landlines. Callers can dial 911 and reach the PSAP even if the ALI systems are not operating, and the PSAP can dispatch the appropriate public safety response. In these cases, however, a 911 call-taker must obtain location information from the caller rather than the information appearing automatically. In addition, the Arlington County PSAP’s regular business lines (which could also be used during emergencies) were not working because of the problems at the Arlington central office, explained in more detail below.

Arlington Facility

The Arlington facility has two generators that must operate in tandem to support the site. At 10:55 PM on June 29, 2012, the Arlington facility lost commercial power. One of the two generators started, but the other did not. The single running generator could not support the entire site load, became overloaded and shut down as designed. Back-up batteries served the office's equipment into the morning of June 30. A power technician arrived at 12:28 AM on June 30, but despite best efforts throughout the night, could not get the second generator started. At approximately 5 AM on June 30, the batteries drained completely and network equipment failed.³ We deployed additional resources, working in parallel both to start the second generator and prepare a replacement mobile generator. Commercial power was restored at 12:45 PM before those efforts were completed.

Significantly, during the period while power was out in Arlington, we lost our telemetry systems and thus our ability to monitor parts of our network and facilities in Northern Virginia, including the Fairfax facility. Once Arlington was restored, our visibility into the network began to restore.

Fairfax Facility

The Fairfax facility has two generators that each support specific components of the network when commercial power is lost. At approximately 10:35 PM on June 29, the Fairfax facility lost commercial power. One of the generators started and supported its equipment as designed. The other generator did not start, so back-up batteries served the corresponding equipment into the morning of June 30. At approximately 6:15 AM, the batteries completely drained and the network equipment in the specific section of the facility served by the inoperable

³ Some network equipment is more sensitive to low voltage and failed before the batteries were completely exhausted.

generator failed. Throughout this period, the other generator supported its network equipment in the rest of the building. That morning, because we had lost visibility to the network at large, the decision was made to send technicians to various facilities, including Fairfax. A central office technician arrived at the site at 7:30 AM but did not immediately recognize that one section of the facility was not on generator. At approximately 9:45 AM, the central office technician realized there was an issue in one section of the building and called for a power technician. The power technician arrived at the Fairfax facility at approximately 11:30 AM, investigated the power plant, determined that the second generator had failed to start, initiated the starting procedures, and brought the generator back on manually by 12:15 PM. We immediately started restoring the equipment in the office and bringing services back on line.

We have since conducted extensive testing using third-party experts to determine why the second generator in the Arlington facility did not start. We determined that air had entered the fuel system, resulting in a lack of fuel in the lines. We have since replaced the fuel lines for both of the back-up generators at the Arlington facility (even though no leaks were found in the generator that started).

In Fairfax, Verizon's investigation has determined that the Fairfax generator did not start because the auto-start mechanisms failed. Those mechanisms are designed to automatically start the generator once commercial power is lost, but they did not operate correctly and have since been replaced.

Proactive Improvements

While the back-up power systems in place should have withstood the Derecho without the resulting 911 problems, our investigation has identified issues for which we are undertaking corrective action:

Issues	Corrective Actions
<p><u>Generator system failures</u> As described above, we suffered key generator system failures that were different in each location. The specific failures have been repaired but we are extending our review of critical locations to address potential issues.</p>	<ul style="list-style-type: none"> • Conduct backup power system audits in the mission-critical Verizon facilities supporting 911 in Virginia, Maryland and Washington, D.C. • Institute any corrective measures identified in those power audits. • For example, we have already completed the Arlington audit and are instituting automated controls to prioritize system loads (e.g., telemetry) in case one of the two generators fails.
<p><u>Emergency Practices and Procedures</u> Our investigation determined we could have improved our restoration of service had we (i) recognized more quickly the partial power outage in Fairfax and (ii) been able to power some network equipment (e.g., telemetry systems) on the one generator in Arlington that was working.</p>	<ul style="list-style-type: none"> • Develop and post site-specific backup power system assessment procedures that can be used by any employee to assess if there is a loss of power to an area of a building. • Develop and post site-specific manual generator start and transfer procedures, including serving system loads on a prioritized basis. • Enhance our critical facility “Black Out” testing. We test our back-up power systems regularly but will enhance this testing to include “failed automated controls” and “prioritized system load transfer” scenarios.
<p><u>Communication and Mobilization</u> We have a standard practice of internal mobilization based on actual or potential service impacts. These are triggered by alarms. The loss of visibility prevented us from receiving these alarms and delayed our response.</p>	<ul style="list-style-type: none"> • Create two new event criteria for notification and mobilization purposes. We have enhanced our notification and mobilization procedures to trigger activity more quickly when batteries are activated or when telemetry is lost.
<p><u>Loss of visibility to multiple sites</u></p>	<ul style="list-style-type: none"> • Redesign the telemetry network. We are redesigning the telemetry network to include more diverse connections and failover (alternative) locations.

PSAP-Specific Routing Issues Compounded the Generator-Starting Problems

Verizon’s 911 design provides multiple diversities or redundancies “inside the network.”

There are multiple tandem offices providing routing so that, if one fails, the calls to the failed

office are routed through the other(s). Verizon's ALI databases and links to each ALI database are redundant, as are Verizon's signaling systems, which route calls to their destinations. Verizon's analysis of the network impacts following the Derecho has identified areas for improvement, especially with ALI diversity, with specific PSAP configurations. Verizon will work directly with the specific PSAP partners to decide on improvements.⁴

Communication Improvements Are Being Addressed

PSAP Communications

Over the past few years, Verizon has established robust processes to communicate with PSAPs during an emergency or system failure, particularly during high-volume (also known as “mass calling” or “focused overload”) situations. In fact, we have a large team entirely dedicated to communicating with PSAPs. These new processes generally worked well during the Derecho, as Verizon stayed in constant communication with PSAPs during the 911 outages, including sending automatic notifications to PSAPs when certain alarms were triggered. But once Verizon lost its telemetry, we did not have the specific information needed by the PSAPs to understand the impact of the event and plan for alternatives. And certain automatic notifications that go to PSAPs stopped when the alarms stopped. As discussed above, Verizon is working to develop a better design to retain its visibility into the network, which will improve the utility of the communications in the face of catastrophic failures.

As an example of how the lack of network visibility hindered communications, certain PSAPs, when they were no longer receiving 911 calls the morning after the storm, activated “network controls” to re-route calls through different paths or to a pre-designated alternate

⁴ Verizon is obliged to maintain the confidentiality of its specific PSAP customers' network arrangements and is not free to share those details publicly; in addition, sharing such network design information would create security vulnerabilities.

location. Verizon has since determined that certain of these PSAPs would have been better off not doing so (i.e., they would have started receiving 911 calls earlier if they had not re-routed calls through different paths), but without the appropriate information, they were unable to make that determination at the time. We will discuss the network control process with the individual PSAPs to determine if improvements can be made (e.g., PSAPs may want to deactivate such controls if they do not improve call completion).

The 911 Directors of the City of Alexandria, and the Counties of Arlington, Fairfax, Loudoun, Prince William and Stafford have recommended that Verizon adopt five steps in response to the storm, primarily focused on communications. The recommendations are constructive suggestions, and we look forward to working with the 911 Directors to most effectively implement these concepts. Specifically:

Recommendation	Assessment
<p>Verizon adopt, embrace, instruct, train and utilize the National Incident Management System (NIMS) model, to address and mitigate any and all significant events/incidents impacting providing 9-1-1 service to the aforementioned jurisdictions.</p>	<p>Positive. Verizon employs an "all hazards approach" to its Business Continuity, Disaster Recovery, Facility Preparedness and Emergency Management programs. These are essential to the protection of its employees, critical business processes and structural facilities located around the globe.</p> <p>Verizon today employs an Incident Management System (IMS) along with the concept of Crisis Management Centers to standardize control of certain emergency situations. When invoked, that process utilizes the National Incident Management System (NIMS) principles as published by the Department of Homeland Security. Verizon offers internal training and orientation courses on its National Emergency Command Center (NECC) Process, and an Introduction to the National Incident Management System. (In this event, Verizon did not activate its Emergency Command Center process; as noted above, thresholds for</p>

	<p>invoking that process have been strengthened to more readily bring those procedures to bear in similar situations.)</p>
<p>Verizon obtain and utilize a Reverse 911® type system to notify, via voice and text, those persons identified by the above jurisdictions, as soon it is known or suspected by Verizon that there is or may be an interruption of 9-1-1 service to any or all of the above jurisdictions. The immediately transmitted voice and text message should contain, in plain language, the nature of the problem, current or potential impact of the problem, what Verizon is doing to address the problem, recommend actions the impacted 9-1-1 center(s) should take and other appropriate information and include the name of the sender and the telephone number (business and mobile) at which the sender can be reached, and their email address.</p>	<p>Positive. Since March 2011, Verizon has employed a broadcast email process to provide specific ticket information to individual PSAPs, and also to provide general information and updates on issues that affect multiple PSAPs. Verizon will expand that process to include texting and will work with 911 Directors to establish the correct contact lists and process details.</p> <p>Based on experience with the email process, it is evident that there is no one common standard vehicle that is universally desired by all PSAPs. Verizon will work with the 911 Directors to accommodate specific needs within a standard process.</p> <p>Verizon will make every effort to share actionable information with PSAPs as soon as we are aware of service interruptions. For events that may impact multiple PSAPs, we will recommend that conference bridges will be established to brief PSAPs on the situation and allow for questions and discussion. Recommended actions would be specific to each PSAP (based on their back-up configuration and event impact) and need to be developed jointly between Verizon and the PSAP.</p>
<p>Verizon work with the jurisdictions to develop, by no later than December 31, 2012, a method to semi-annually conduct a drill/exercise with each jurisdiction on actions to be taken by Verizon and the impacted jurisdiction(s) in the event of a potential or actual 9-1-1 outage.</p>	<p>Positive. Verizon will engage the assistance of its Business Continuity Emergency Management (BCEM) team to work with Verizon’s 911 Customer Care Center organization to develop and exercise procedures for drills that model potential or actual 911 outages with any of the jurisdictions that request such a joint exercise.</p>
<p>Verizon provide the above jurisdictions, during the first week of each month, a current contact list; beginning with the name and contact information (email, business telephone number, business</p>	<p>Positive. A draft will be provided to PSAPs for comment and concurrence by August 17, 2012.</p>

<p>mobile telephone number and any other appropriate information) for the Verizon account manager assigned to the jurisdiction and four immediately escalating Verizon personnel up to a Vice President level.</p>	
<p>Verizon, if/when requested by any of the above jurisdictions, have a Verizon representative with authority to act/react; respond to and to be present at the jurisdictions' Emergency Operations Center (EOC), to provide current accurate information concerning 9-1-1 service and outages, other telephone service, etc. and liaison with other parties staffing the EOC, when the EOC is activated.</p>	<p>Positive. Verizon will work with the 911 Directors to explore ways in which we can accommodate this request. We have discussed options for virtual participation in any EOC via an "instant messaging - like" application with the Virginia Commonwealth emergency management leaders. We have discussed joint training with Fairfax Emergency Management personnel and would welcome the opportunity to participate in that activity. If PSAP discussions regarding a joint regional 911 EOC become the strategy, that would present an excellent vehicle for Verizon to be present with multiple jurisdictions in an emergency situation.</p>

Public Communications

In the future, when we face significant network-related issues like those caused by the Derecho, Verizon will share additional information about our restoration efforts more quickly to provide greater insight regarding the extent of the impact to our subscribers and the expected duration of the restoral efforts. We are mobilizing a more robust emergency response communications process to ensure that media outlets and other channels are provided relevant information on a timely basis.

Conclusion

Verizon understands the critical role of 911 services to the community, and is committed to making improvements to avoid the performance of the 911 system during the Derecho. We will work directly with the PSAPs, as well as the various governmental bodies considering these important matters, to implement the lessons learned. And we will look to apply improvements and lessons learned from the Washington metropolitan area to other areas in our service territory as well.

Attachment 2

