



PUBLIC NOTICE

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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

PS Docket No. 11-60

Comments Due: August 17, 2012
Reply Comments Due: September 4, 2012

Introduction

On June 29, 2012, a fast-moving weather storm called a derecho brought a wave of destruction across wide swaths of the United States, beginning in the Midwest and continuing through the mid-Atlantic and Northeastern regions of the country. Millions of Americans lost electrical power during the storm for periods ranging from a few hours to over a week in the middle of a heat wave, and the storm caused billions of dollars in physical damage. The storm had a significant adverse effect on communications services generally and 9-1-1 facilities particularly.¹ From isolated breakdowns in Ohio, Kentucky, Indiana, and Pennsylvania, to systemic failures in northern Virginia and West Virginia, it appears that a significant number of 9-1-1 systems and services were partially or completely down for several days.

The impact of the storm in northern Virginia was particularly severe, notably in Fairfax County, parts of Prince William County, Manassas Park and Manassas, where over 1 million people faced the possibility of not being able to call 9-1-1 successfully.² In those jurisdictions, media reports and local government officials indicate that public safety answering points (PSAPs), which process calls to 9-1-1 facilities, failed, as did backup systems. Multiple access technologies appear to have been affected by the outages, including traditional networks, broadband networks, and wireless networks.

The Public Safety and Homeland Security Bureau (PSHSB or Bureau) of the Federal Communications Commission (FCC or Commission) responded immediately, closely coordinating with the Federal Emergency Management Agency (FEMA) and constantly communicating with service providers and other stakeholders from the time the storm hit and throughout the period impacts were felt by the public. At noon on Saturday, June 30, the Commission granted an emergency special temporary authorization allowing a Missouri power company crew to use certain frequencies to assist in the restoration of electric power within the Ohio disaster area.

¹ See, e.g., Sullivan, Pat, *911 Failure Affected 2.3 Million in Northern Virginia*, WASH. POST, Jul. 11, 2012.

² See, e.g., Sullivan, Pat, *After Storm, 9-1-1, Phone Service Remains Spotty*, WASH. POST, Jul. 2, 2012.

Utilizing the Commission's Operations Center, which is staffed 24 hours a day/7 days a week, and supplementing it with direct outreach and pre-established reporting protocols, the Commission obtained important information on communications outages related to 9-1-1 centers, broadcast stations, and public safety communications systems that it shared with its Federal partners (e.g., FEMA). Vital information on outages also came through the Commission's mandatory Network Outage Reporting System (NORS) and voluntary Disaster Information Reporting System (DIRS). At 5:15 p.m. on Saturday, June 30, the Commission activated DIRS, targeting selected providers with systems in the disaster area, in this case the District of Columbia and certain counties in Maryland, Virginia, and West Virginia. Through DIRS, the Commission received regular updates on the status of wireline, wireless, and 9-1-1 communications outages and restoration efforts. As company maintenance crews largely restored communications services in certain areas, the Commission de-activated DIRS for those areas on July 3, 2012 and completely deactivated it on July 4, 2012. The Commission also issued on its website and distributed through social media a consumer tip sheet for the public about communicating after the derecho, while the effects of the storm were still being felt.

Immediately after communications and 9-1-1 services were restored, the Bureau began an inquiry focused on learning all of the facts and circumstances of the various outages, including the causes and, importantly, ways to make the public safer and avoid future outages. The Bureau began an ongoing series of meetings with stakeholders, such as communications service providers, public safety officials, and others, and continues to seek and obtain relevant information. The Bureau is assessing and evaluating the storm-related information received through NORS or DIRS, and still coming in through NORS. The Bureau is also coordinating with state and local governments, which are responsible for establishing and operating 9-1-1 facilities, providing first responder services, and regulating certain relevant communications services.

By this Public Notice, the Commission and the Bureau further expand the ongoing inquiry. The Public Notice broadens the inquiry in two ways, by expanding those who may contribute relevant information to include the public, and focusing not only on issues directly surrounding the derecho and what happened during and after it, but also on other experiences associated with natural disasters throughout the nation that involve outages or are otherwise related to the resiliency and reliability of communications services and networks of all kinds that are used to seek, process or obtain emergency assistance. Especially in the face of events that lead more people than usual to need emergency help, they must be able to connect to get it. It is vital to seek focused comments broadly on what happened during and after this or other storms, and what can be done to better address these issues going forward.

Congress has given the Commission a particular responsibility under the Communications Act to ensure communications networks of all types "promot[e] safety of life and property."³ Central to this important responsibility is ensuring the reliability, resiliency and availability of communications networks in times of emergency, including and especially during and immediately after a natural disaster such as a derecho. Recognizing this, last year the Commission initiated a proceeding on the reliability and

³ See 47 U.S.C. § 151; see also 47 U.S.C. § 154 (o) ("For the purpose of obtaining maximum effectiveness from the use of radio and wire communications in connection with safety of life and property, the Commission shall investigate and study all phases of the problem and the best methods of obtaining the cooperation and coordination of these systems.") In addition, the Commission recently strengthened its outage reporting requirements by extending them to interconnected VoIP services. See In the Matter of the Proposed Extension of Part 4 of the Commission's Rules Regarding Outage Reporting To Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers, PS Docket No. 11-82, 27 FCC Rcd 2650 (2012).

continuity of communications networks, including broadband technologies.⁴ Information received in connection with this Public Notice will add important information that will inform the Commission's action in this proceeding.

Request for Comment

The Bureau seeks comment on the background, causes, and restoration efforts related to communications services and facilities impacted directly or indirectly by the storm and after. It seeks to develop a complete and accurate record of all the facts surrounding the outages during this storm as well as outages resulting from natural disasters in order to evaluate the overall resiliency and reliability of our Nation's 9-1-1 systems and services. We also seek comment on the impact these outages had on the various segments of the public, including consumers, hospitals, and public safety entities.

The Bureau's review is also intended to further develop the record in the Commission's ongoing examination of issues in the April 2011 notice of inquiry (NOI) on the resiliency, reliability and continuity abilities of communications network, including broadband technologies,⁵ and comments received in response to this Public Notice will become part of the record of the NOI. In that proceeding, the Commission initiated a comprehensive examination of these issues with the goal of determining what action, if any, the Commission should take to ensure that our Nation's communications infrastructure is as reliable as possible and able to continue to function in times of emergency. In its NOI, the Commission also focused on 9-1-1 reliability and stated that "[p]eople dialing 9-1-1, whether using legacy or broadband-based networks, must be able to reach emergency personnel for assistance; and when networks dedicated to public safety become unavailable, first responders must have access to commercial communications, including broadband technologies, to coordinate their rescue and recovery efforts."⁶

Questions Regarding Derecho Impact, Effects, and Restoration Efforts

Below, the Bureau poses a series of questions related to the impact of the storm on emergency and 9-1-1 communications accessed by traditional communications networks, broadband communications networks, and wireless communications networks. The Bureau also requests comment on the storm's impact on various user groups. PSHSB seeks comment on the following issues:

Causes of Outages. What were the specific causes of the outages that occurred during or after the storms? Which network elements and components, such as Public Switched Telephone Network (PSTN) trunks, Internet-Protocol (IP) broadband access lines, databases and PSTN switches, were out of service and for how long? For example, to what extent were issues like powering, physical damage, and power surges contributing factors to the outages? To what extent are there industry best practices that address these, and any other, contributing causes? To what extent were they followed?

In what ways was physical damage due to the storm a major cause of outages? What could be done to improve the resiliency of communications infrastructure in the face of physical damage like what was seen during the storm? Are there actions the communications industry can take to avoid or mitigate

⁴ See *In the Matter of Reliability and Continuity of Communications Networks, Including Broadband Technologies, et al., Notice of Inquiry*, PS Docket No. 11-60, *et al.*, 26 FCC Rcd 5614 (2011) ("*Reliability NOI*").

⁵ See generally, *Reliability NOI*.

⁶ See *Reliability NOI*, 26 FCC Rcd at 5616 ¶ 5.

these outages in future similar events? Should the FCC take other steps to improve communications resiliency during strong storms like this?

In what ways was the derecho an “extraordinary” event? For example, compared to other types of disasters, did it occur with unusually short notice, affect an unusually large area, and was it unusually intense? How did these factors inhibit service providers in responding to the event and restoring service? How did these factors affect consumers’ need for communications services and ability to obtain emergency services? What could be done to better prepare for events like this in the future? Specifically, what actions should communications service providers and PSAPs take to better prepare for similar events in the future?

How did service providers become aware that 9-1-1 outages had occurred? What types of monitoring systems were in place for various types of assets, both in the field and inside buildings? How well did these monitoring systems perform during the storm?

What role did the availability or absence of back-up power for network equipment play in the 9-1-1 outages that occurred during the storm? What could be done to improve the ability of communications assets to operate longer when commercial power is lost? Are there new technologies, such as solar and fuel cells, which provide promise in this area? What maintenance practices are in place to compensate for the loss of commercial power? How did these methods perform during the storm? Are there actions the FCC should take to improve the ability of communications networks to survive commercial power outages? What types of measures could be taken to improve the robustness of communications infrastructure in response to failures of commercial power? Should the Commission consider taking action, either voluntary or mandatory, that would address back-up power?

What forms of network interconnection, both PSTN and IP, were affected by the storm or loss of power? How and why were they affected? Did these disruptions affect communications seeking 911 or other emergency assistance and how? What carrier and public safety facilities have multiple means or forms of interconnection and which do not? Which of these facilities are essential for 911 communications? What monitoring of interconnection was in place and how did it perform? To what extent are there industry best practices addressing forms of interconnection and diversity and redundancy? To what extent were they followed?

Effect on 9-1-1 Systems and Services. What could be done to improve the reliability of the 9-1-1 network when faced with storms like the derecho or other threats? Are there actions the FCC should take to improve the reliability of 9-1-1 services during strong storms like this? What actions should communications service providers take? Are there actions that communications service providers and/or PSAPs should take to improve the 9-1-1-restoration process? What, if anything, can the FCC do to better assist communications service providers and PSAPs in the restoration process?

How was 9-1-1 call completion affected by outages caused by the storm? Is there an estimate of how many 911 calls could not be completed at all or only through alternate means, such as ten-digit numbers? To what extent do industry best practices exist that relate to these events, and were these best practices followed? Were there instances where PSAPs went offline due to failures on their own premises? To what extent did the storm affect Automatic Number Identification (ANI) and Automatic Location Identification (ALI)? What were the primary causes of failures to ANI and ALI services? To what extent were vital 9-1-1 facilities and network elements deployed redundantly by service providers? For example, were selective routers routinely deployed in a diverse manner? Likewise, were facilities

that carry ALI and ANI information routed in a diverse manner? What should be done to improve the diverse provisioning of 9-1-1 facilities and elements?⁷

Effect of 9-1-1 Outages. What impact did the 9-1-1 outages have on the public? For example, how were consumers affected? How did the outages affect the ability of public safety officials to perform their duties? How was the public alerted of the 9-1-1 outages and what alternatives were provided? How effective were these alternatives? To what extent was social media used to spread the word about the 9-1-1 outages and alternatives? What impact did the 9-1-1 outages have on other sectors of the user community, including businesses and providers of critical services, such as hospitals?

Effect of Communications Outages on Access to 9-1-1 Services. Outages in the 9-1-1 network itself are only one way that users can be denied access to 9-1-1 services. For example, if the PSAP is operational and the 9-1-1 network is functioning, users in a local area will still be unable to reach the PSAP if they lack access to the communications network due to a local outage. To what extent did users find that the general unavailability of communications service impaired their ability to access 9-1-1 service? In these instances, were multiple methods of reaching the PSAP available, like cell phones or other types of communications services? How effective were these alternative communications services in overcoming outages affecting one access platform? What should be done to improve the diversity of access to 9-1-1 services so that communications outages are less likely to result in an inability to access 9-1-1?

Questions Regarding 9-1-1 Resiliency and Reliability Generally

The 9-1-1 communications failures experienced as a result of the derecho also give rise to concerns and questions about the reliability and resiliency of our 9-1-1 communications networks nationwide, particularly in the event of a severe weather or other type of high-impact natural disaster. We seek comment on how 9-1-1 communications has fared during other recent natural disaster events. Please describe any lessons learned from those events, in particular improvements that were recommended to improve 9-1-1 service reliability and survivability. Commenters should address the impact on communications relying on the PSTN- and IP-based communications, as well as fixed and mobile wireless communications.

We also seek comment on the most common causes of failure in the 9-1-1 network that result in the following types of 9-1-1 outages: i) complete isolation of the PSAP; ii) failure to pass ALI and/or ANI; iii) loss of the ability to re-route traffic to an alternate PSAP or administrative lines. What could be done to reduce the incidence of outages in each category? What actions, if any, should the FCC take to address this problem?

In what ways does the practice of deploying redundant facilities or systems used in the 9-1-1 network promote 9-1-1 reliability? How does the service provider ensure that these practices are followed routinely and remain in place over time, even as changes are made to the networks? What, if anything, should the FCC do to promote the application of such methods?

How do service providers routinely monitor 9-1-1 facilities and the availability of 9-1-1 service? How quickly do service providers become aware of 9-1-1 failures of various kinds? Do service providers

⁷ *Public Notice*, FCC's Public Safety and Homeland Security Bureau Reminds Telecommunications Service Providers of the Importance of Implementing Established 9-1-1 and Enhanced 9-1-1 Best Practices, DA 12-891, rel. June 6, 2012.

routinely notify PSAPs of 9-1-1 outages? How are they alerted, under what conditions, and how quickly? What steps does the service provider take routinely to prioritize restoration of 9-1-1 service? What standard operating procedures and systems does the service provider have in place to facilitate the detection and restoration of 9-1-1 service after an outage? Are these resources adequate?

PSAPs are typically small operations playing a large role in protecting the safety of the public. The failure of a few trunks into a PSAP could affect public safety for an entire community, but the failure of just a few trunks might not attract much attention from a service provider. Do provider alarm systems provide adequate visibility to relatively small outages that can have a large impact on PSAPs, especially when demand may spike, such as during or after a major storm? Do providers provide appropriate urgency to handling such outages?

To what extent is the availability of multiple access platforms (*e.g.*, residential telephone line, whether legacy or IP-based, cell phone, *etc.*) to reach networks services creating greater richness of diversity that would tend to improve 9-1-1 reliability? Stated differently, to what extent does the public have more than one way to reach 9-1-1 that are not reliant on each other? To what extent are available access platforms reliant on each other or another common point of failure?

The legacy communications network uses a hierarchical architecture, whereby failures of network elements located deeper in the network will result in a larger number of customers being denied network service. For this reason, elements deeper in the network (*e.g.*, switches) were often designed to very high reliability specifications. To what extent has the legacy infrastructure retained this characteristic? Today's networks are quickly migrating to broadband IP technology. To what extent does the migration to IP-based networks reduce or increase the level of concentration deeper in the network? What is the resultant impact on communications reliability?

What other steps might service providers take? What actions should PSAPs take? What other actions, if any, should the Commission take to encourage those steps? What actions should the public and other institutions like hospitals take, if any? We seek comment on whether the deployment of Next Generation (NG911) will improve the reliability of 9-1-1 services and, if so, how? Would NG911 make it easier to have more than one backup PSAP and provide additional redundancy of transmission facilities, *e.g.*, via satellite or microwave point-to-point links? Did commercial data centers in the affected areas experience outages and for how long? Would it increase reliability if critical components of the NG911 system are housed or replicated in commercial data centers?

NG911 will create the ability to utilize a "virtual PSAP." Today's 9-1-1 system generally requires a call taker to answer a 9-1-1 call from within the walls of a single physical ("brick and mortar") PSAP. In a NG911 network, however, a call taker will be able to answer a 9-1-1 call from virtually any location. We seek comment on the potential for development of virtual PSAPs. Are current technologies sufficient to support virtual PSAPs? Are there specific steps that service providers should take to ensure that they have adequate reliability when implementing NG9-1-1? How would the addition of a 9-1-1 text capability provide substantial improvement in the ability of consumers to contact PSAPs?

Procedural Matters

Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://fjallfoss.fcc.gov/ecfs2/>.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer and Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).

Parties wishing to file materials with a claim of confidentiality should follow the procedures set forth in section 0.459 of the Commission's rules. Casual claims of confidentiality are not accepted. Confidential submissions may not be filed via ECFS but rather should be filed with the Secretary's Office following the procedures set forth in 47 C.F.R. § 0.459. Redacted versions of confidential submissions may be filed via ECFS. Parties are advised that the Commission looks with disfavor on claims of confidentiality for entire documents. When a claim of confidentiality is made, a public, redacted version of the document should also be filed.

The proceeding of which this Notice is a part is a "permit-but-disclose" proceeding conducted in accordance with the Commission's *ex parte* rules.⁸ Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing

⁸ 47 C.F.R. §§ 1.1200 *et seq.*; *see also Reliability NOI*, 26 FCC Rcd at 5630-31 ¶ 53.

oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

For further information regarding this proceeding, contact Michael Connelly, Cybersecurity and Communications Reliability Division, Public Safety and Homeland Security Bureau at (202) 418-0132 or michael.connely@fcc.gov. News media contact: Lauren Kravetz, Public Safety and Homeland Security Bureau at (202) 418-7944 or lauren.kravetz@fcc.gov.

The Public Safety and Homeland Security Bureau issues this Public Notice under delegated authority pursuant to Sections 0.191 and 0.392 of the Commission's rules, 47 C.F.R. §§ 0.191, 0.392.