

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of
Improving 9-1-1 Reliability
Reliability and Continuity of Communications
Networks, Including Broadband Technologies
PS Docket No. 13-75
PS Docket No. 11-60

NOTICE OF PROPOSED RULEMAKING

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By the Commission: Chairman Genachowski and Commissioners McDowell, Clyburn, Rosenworcel and Pai issuing separate statements.

I. INTRODUCTION

1. In this Notice of Proposed Rulemaking (Notice or NPRM), we seek comment on approaches to ensure the reliability and resiliency of the communications infrastructure necessary to ensure continued availability of the Nation’s 9-1-1 system, particularly during times of major disaster. We take this action in response to the findings and recommendations presented in the Public Safety and Homeland Security Bureau’s (PSHSB or Bureau) January 10, 2013, report titled Impact of the June 2012 Derecho on Communications Networks and Services: Report and Recommendations (Derecho Report).1 In that report, following an extensive inquiry and review of comments, the Bureau found that the June 2012 derecho2 affecting the Midwest and Mid-Atlantic United States severely disrupted 9-1-1-related communications and that these disruptions were due in large part to avoidable planning and systems failures within 9-1-1 service providers’ networks. The Bureau concluded that these failures could, and would, have been avoided if providers had followed industry best practices and other sound engineering principles. Unlike a hurricane or superstorm predicted well in advance, the derecho arrived with very little notice, testing the preparedness and resiliency of 9-1-1 communications in the face of a sudden emergency. This test revealed serious vulnerabilities that cannot be overlooked. Accordingly, the Bureau recommended that the Commission consider action in the following areas: (1) 9-1-1 circuit auditing; (2)

1 FCC PUB. SAFETY & HOMELAND SEC. BUREAU, IMPACT OF THE JUNE 2012 DERECHO ON COMMUNICATIONS NETWORKS AND SERVICES: REPORT AND RECOMMENDATIONS (PSHSB, rel. Jan. 10, 2013), available at http://www.fcc.gov/document/derecho-report-and-recommendations (Derecho Report).

2 The National Weather Service defines a derecho as “a widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. Although a derecho can produce destruction similar to that of tornadoes, the damage typically is directed in one direction along a relatively straight swath. As a result, the term ‘straight-line wind damage’ sometimes is used to describe derecho damage. By definition, if the wind damage swath extends more than 240 miles (about 400 kilometers) and includes wind gusts of at least 58 mph (93 km/h) or greater along most of its length, then the event may be classified as a derecho.” Robert H. Johns, Jeffrey S. Evans, & Stephen F. Corfidi, About Derechos, NOAA-NWS-NCEP STORM PREDICTION CTR. (Nov.7, 2012), http://www.spc.noaa.gov/misc/AbtDerechos/derechofacts.htm.

9-1-1 service provider central office backup power; (3) physical diversity of monitor and control links; and (4) improved outage notification to Public Safety Answering Points (PSAPs). This *Notice* seeks comment on approaches to implement these recommendations.

2. Our action today helps fulfill Congress's charge to the Federal Communications Commission (FCC or Commission) to ensure that communications networks of all types "promot[e] safety of life and property."³ Congress has also tasked the Commission with more specific responsibilities relating to 9-1-1 service, in order to "ensur[e] that 911 service is available throughout the country,"⁴ and in order to encourage and facilitate a "reliable" nationwide "infrastructure for communications . . . to meet the Nation's public safety and other communications needs."⁵ Central to this important responsibility is promoting the reliability and resiliency of critical communications infrastructure at all times, including in times of natural and other disasters.

3. Today's *Notice* also builds on the Commission's previous efforts to ensure that the public has access to a state-of-the-art, reliable, and resilient 9-1-1 communications system. Most notably, the Commission has taken a number of steps to promote the deployment of Next Generation 9-1-1 (NG9-1-1), an Internet Protocol (IP)-based architecture that can provide an expanded array of emergency communications services, including improved 9-1-1 redundancy and reliability,⁶ compared to the circuit-switched system. In September 2011, the Commission released a *Notice of Proposed Rulemaking* that sought comment on a number of issues related to the deployment of NG9-1-1.⁷ In December 2012, the Commission secured a voluntary commitment from the four largest wireless carriers to make text-to-9-1-1 available to their customers by May 15, 2014.⁸ Building on this commitment, the Commission has since proposed to require all wireless carriers and certain other text providers to provide text-to-9-1-1 capability to their customers within the same or a similar timeframe.⁹ In addition, in May 2012, the Commission promoted the reliability of 9-1-1 for consumers relying on interconnected Voice over Internet Protocol (VoIP) technologies by requiring interconnected VoIP service providers to report major disruptions to

³ 47 U.S.C. § 151; *see also* 47 U.S.C. § 154(o) (addressing the "[U]se of communications in safety of life and property").

⁴ *See Nuvio Corp. v. FCC*, 473 F.3d 302, 311 (D.C. Cir. 2007) (Kavanaugh, J., concurring) (citing ENHANCE 911 Act of 2004, Pub. L. No. 108-494, § 102, 118 Stat. 3986, and stating that a universal 9-1-1 number with enhanced capabilities should be available to all citizens in all regions of the nation).

⁵ Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, § 2(b), 113 Stat. 1286.

⁶ NG9-1-1's use of IP-based architecture provides far more routing options than circuit-switched architecture because it is not constrained by the location of the caller or the nearest PSAP to the caller. For example, in circuit-switched networks, selective routers must be relatively close to the PSAPs they serve, whereas in NG9-1-1, 9-1-1 traffic can be easily rerouted to servers and locations outside the affected area, providing more resiliency and redundancy in disaster situations. *See Framework for Next Generation 911 Deployment*, PS Docket No. 10-255, *Notice of Inquiry*, 25 FCC Rcd 17869, 17880-81, ¶¶ 26, 29 (2010) (*NG9-1-1 NOI*).

⁷ *See Facilitating the Deployment of Text-to-911 & Other Next Generation 911 Applications*, *Notice of Proposed Rulemaking*, PS Docket No. 11-153, 26 FCC Rcd 13615 (2011).

⁸ *See Letter from Terry Hall, APCO International, Barbara Jaeger, NENA, Charles W. McKee, Sprint Nextel, Robert W. Quinn, Jr, AT&T, Kathleen O'Brien Ham, T-Mobile USA, and Kathleen Grillo, Verizon, to Julius Genachowski, Chairman, Federal Communications Commission, and Commissioners McDowell, Clyburn, Rosenworcel and Pai*, PS Docket 11-153, PS Docket No. 10-255 (Dec. 6, 2012).

⁹ *See Facilitating the Deployment of Text-to-911 & Other Next Generation 911 Applications*, *Further Notice of Proposed Rulemaking*, PS Docket No. 11-153, 27 FCC Rcd 15659 (2012).

communications services.¹⁰ Most recently, in February 2013, the Commission submitted a report to Congress regarding the legal framework for deployment of NG9-1-1.¹¹

4. Taking a broader look at network reliability, in 2011, the Commission released a *Notice of Inquiry* in this docket which sought comment on the reliability, resiliency, and continuity of our Nation's communications networks, including broadband technologies.¹² Among other topics, we inquired about "the ability of communications networks to provide continuity of service during major emergencies, such as large-scale natural and man-made disasters."¹³ The Commission also discussed a variety of actions it could take "to foster improved performance with respect to the reliability and continuity of operations."¹⁴ Observing that "access to communications services increasingly becomes a matter of life or death" during natural or human-caused disasters, the Commission emphasized that "[p]eople dialing 9-1-1, whether using legacy or broadband-based networks, must be able to reach emergency personnel for assistance."¹⁵ Through this proceeding, the Commission sought to develop a record aimed at strengthening communications networks and ensuring that emergency communications services are available when they are needed most. More recently, in November 2012, Chairman Julius Genachowski announced field hearings in which the Commission would gather information regarding the reliability of the Nation's communications networks.¹⁶ The first hearing, held on February 5, 2013, in New York City and in Hoboken, New Jersey, focused on the severe impact to communications resulting from Superstorm Sandy, the response, and access to information during the storm's aftermath.¹⁷ A second hearing on February 28, 2013, at Moffett Federal Airfield in California, focused on how innovative network technologies, smart power solutions, social media, and mobile applications might improve communications network resiliency in times of disaster.¹⁸

¹⁰ See Proposed Extension of Part 4 of the Commission's Rules Regarding Outage Rule To Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers, PS Docket No. 11-82, *Report and Order*, 27 FCC Rcd 2650 (2012).

¹¹ See RECOMMENDATIONS FOR NEXT GENERATION 9-1-1 LEGAL FRAMEWORK: FCC REPORT TO CONGRESS (2013) (submitted pursuant to § 6509 of the Next Generation 9-1-1 Advancement Act of 2012, enacted as part of the Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, tit. VI, subtitle E) (NG9-1-1 Legal Framework Report).

¹² 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*).

¹³ *Id.* at 5615, ¶ 2.

¹⁴ *Id.*

¹⁵ *Id.* at 5616, ¶ 5.

¹⁶ See News Release, FCC Chairman Genachowski Announces Post-Superstorm Sandy Field Hearings to Examine New Challenges to Resiliency of U.S. Communications Networks During Natural Disasters & Other Times of Crisis (Nov. 21, 2012), *available at* http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db1121/DOC-317543A1.pdf.

¹⁷ See FCC Announces Date and Locations for the First Post-Superstorm Sandy Field Hearing, *Public Notice*, DA 13-19 (Jan. 8, 2013), *available at* http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0108/DA-13-19A1.pdf. While the hearings focus on communications reliability more generally, this *Notice* focuses on actions specifically related to those entities providing 9-1-1 service as defined below, in light of the devastating impact caused by the unanticipated June 2012 derecho on 9-1-1 communications.

¹⁸ See FCC Announces Additional Details of Second Field Hearing, *Public Notice*, DA 13-289 (Feb. 26, 2013) *available at* <http://www.fcc.gov/document/fcc-announces-additional-details-second-field-hearing>.

5. In issuing this *Notice*, the Commission seeks comment on proposed approaches to address the major recommendations in the *Derecho Report* with a view toward ensuring that the devastating impact to 9-1-1 that resulted from the June 2012 derecho does not occur in the future. In doing so, we seek to weigh both public safety concerns and the benefits of flexibility for service providers in how they design and operate their networks and deploy advanced technologies. Our response takes into account the evolving nature of network technologies, as well as the continuing migration of circuit-switched services to IP-based platforms. Thus, any rules or other policies designed to improve 9-1-1 service reliability will be developed with the ongoing transition to NG9-1-1 in mind. We also seek to avoid imposing burdensome constraints on providers in designing and maintaining their networks. At the same time, the Bureau's recommendations are largely drawn from industry best practices developed through recognized fora. These recommendations have been acknowledged by industry to be best practices, and many have been implemented to some degree already. In too many cases, however, neither these best practices nor other compensating steps were sufficiently implemented to safeguard the public's access to 9-1-1 call centers.

6. We recognize that each individual 9-1-1 network is complex and unique in many ways, and that the reliability issues discussed in this *Notice* may not lend themselves to simple solutions based on generalized assumptions. We therefore pose a variety of questions intended to develop a complete record of the technological and policy considerations involved in 9-1-1 reliability, both now and in the future. We also provide a range of proposals to implement each of the Bureau's recommendations and seek comment on all available options, including but not limited to the specific proposals identified in this *Notice*. These include proposals to adopt reliability standards for 9-1-1 service providers,¹⁹ as well as less prescriptive alternative approaches, such as requiring certification by a corporate officer that the company has implemented best practices and sound engineering principles, including any specific exceptions. We then propose specific revisions to the Commission's existing rules regarding notification of PSAPs affected by 9-1-1 outages. After identifying alternative approaches, we seek comment on which would be most effective in implementing each recommendation, alone or in combination, in light of all relevant considerations.

II. BACKGROUND

7. On June 29, 2012, a fast-moving derecho storm brought a wave of destruction across wide swaths of the United States, beginning in the Midwest and continuing through the Appalachians and Mid-Atlantic states until the early morning of June 30. The derecho resulted in 22 deaths and widespread property damage, and left millions of residents without electrical power for as long as two weeks. While the landfall of a hurricane can often be predicted days in advance, allowing first responders and communications providers time to prepare, the derecho moved rapidly across multiple states with very little warning, putting critical infrastructure to an unexpected test.

8. The derecho caused particularly widespread disruptions to 9-1-1 services.²⁰ From isolated breakdowns in Ohio, New Jersey, Maryland, and Indiana, to systemic failures in northern Virginia and West Virginia, a significant number of 9-1-1 systems and services were partially or

¹⁹ The *Derecho Report* focused on the performance during the derecho of 9-1-1 service providers, which, as noted in the *Report*, are the providers (typically Incumbent Local Exchange Carriers (ILECs)) responsible for routing and delivering 9-1-1 calls to PSAPs. *Derecho Report* at 9, n.23. Recognizing, as the Bureau did in its *Report*, *see id.*, that the transition to NG9-1-1 may broaden the class of entities that typically provide such service, we are seeking comment on defining the term "9-1-1 service provider." *See infra* ¶ 23.

²⁰ *See, e.g.*, Patricia Sullivan, *911 Failure Affected 2.3 Million in Northern Virginia*, WASH. POST, July 11, 2012.

completely down for as long as several days. In all, at least seventeen 9-1-1 call centers in three states lost service completely, affecting the ability of more than 2 million residents to reach 9-1-1.²¹ Across the storm's path, at least seventy-seven PSAPs serving more than 3.6 million people in six states lost some degree of network connectivity, including vital information on the location of 9-1-1 callers.²² To put those numbers in perspective, nearly 9 percent of all PSAPs in the six affected states experienced some loss of service, affecting more than 8 percent of those states' total residents. The effects were particularly severe in northern Virginia, where four PSAPs in the densely-populated National Capital Region lost service completely, and in West Virginia, where eleven PSAPs could not receive 9-1-1 calls for as long as twelve hours.²³ Other affected PSAPs lost links providing automatic location information (ALI)²⁴ or had to reroute calls to other jurisdictions.

9. Immediately after communications and 9-1-1 services were restored, the Bureau began a comprehensive inquiry to determine why each outage occurred and how such problems could be prevented in the future. The Bureau analyzed more than 500 confidential Network Outage Reporting System (NORS) reports²⁵ containing telling information on the cause, duration, and resolution of each outage. The Bureau also activated a modified and targeted version of the Disaster Information Reporting System (DIRS)²⁶ allowing service providers in the area hit hardest by the storm to submit status reports to the Commission on a voluntary basis.²⁷ After the storm, Bureau staff interviewed representatives of eight communications providers, 28 PSAPs, three battery manufacturers, one generator manufacturer, and

²¹ *Derecho Report* at 4.

²² *Id.*

²³ *Id.* at 28-34.

²⁴ ALI provides the PSAP with the caller's telephone number, the address/location of the telephone, and supplementary emergency services information. *See* Glossary of Technical Terms: Wireless E9-1-1, <http://www.apcowireless.com/library/ICMAGlossary.pdf>.

²⁵ NORS is the Commission's mandatory web-based filing system through which communications providers covered by the Part 4 outage reporting rules must submit reports to the FCC. This system uses an electronic template to promote ease of reporting and encryption technology to ensure the security of the information filed. The Cybersecurity and Communications Reliability Division of the Public Safety and Homeland Security Bureau administers NORS, monitors the outage reports submitted through NORS, and performs analyses and studies of the communications disruptions reported. Generally, a NORS report must be filed when the effects of an outage reach a certain threshold (*e.g.*, lasting at least thirty minutes and potentially affecting 900,000 user-minutes). Then, the filing party has up to thirty days to supplement the filing with more complete information. *See* 47 C.F.R. § 4.1 *et seq.*; *see also Network Outage Reporting System (NORS)*, FCC, <http://transition.fcc.gov/pshs/services/cip/nors/nors.html> (last visited Feb. 19, 2013) (discussing NORS reporting requirements).

²⁶ DIRS is a voluntary, web-based system that communications companies, including wireless, wireline, broadcast, and cable providers, can use to report communications infrastructure status and situational awareness information during times of crisis. *See Disaster Information Reporting System (DIRS)*, FCC <http://transition.fcc.gov/pshs/services/cip/dirs/dirs.html> (last visited Feb. 19, 2013) (discussing DIRS reporting and enrollment process) Information submitted into DIRS is presumed confidential but may be shared with federal agencies such as the Department of Homeland Security on a confidential basis. *See The FCC's Public Safety and Homeland Security Bureau Launches Disaster Information Reporting System (DIRS)*, *Public Notice*, DA 07-3871 (PSHSB 2007).

²⁷ Sometimes a modified version of DIRS is activated, which calls for only certain fields in the system to be completed and only by certain types of communications providers. During the *derecho*, for example, the Commission did not seek DIRS data from companies such as broadcasters, who were generally understood to be less adversely impacted by this storm.

numerous state and county entities. These interactions, which included six supplemental data requests, clarified and expanded the information the Commission had already received via NORS and DIRS. In addition, the Bureau participated in several federal, state, and local meetings and hearings on the effects of the derecho.²⁸

10. On July 18, 2012, the Bureau released a *Public Notice* seeking comment on issues surrounding the derecho, including the cause of the outages, their effect on public safety, and the resiliency and reliability of 9-1-1 networks generally.²⁹ This *Public Notice* helped focus the Commission's ongoing proceeding regarding the reliability and continuity of communications networks³⁰ on actions to ensure dependable 9-1-1 service, both now and in an NG9-1-1 environment. In response to the *Public Notice*, the Bureau received several dozen filings, including comments and reply comments from communications providers and trade associations, PSAPs and public safety groups, and private citizens. These comments represented a diverse range of interests, from local governments concerned about a pattern of 9-1-1 outages³¹ to communications providers calling for new best practices to address problems they experienced during the derecho.³²

11. In the course of its inquiry, the Bureau found that many communications outages during the derecho, including 9-1-1 outages, could have been prevented through implementation of industry best practices developed by entities such as the Commission's Communications Security, Reliability, and Interoperability Council (CSRIC)³³ and the Alliance for Telecommunications Industry Solutions (ATIS) Network Reliability Steering Committee (NRSC).³⁴ The Bureau found that, above and beyond any physical destruction by the derecho, 9-1-1 communications were disrupted in large part because of avoidable planning and system failures, including inadequate physical diversity and a lack of functional

²⁸ See *Resilient Communications: Current Challenges and Future Advancement: Hearing Before the Subcomm. on Emergency Preparedness, Response, & Commc'ns of the H. Comm. on Homeland Sec.*, 112th Cong. (Sept. 12, 2012) (statement of David S. Turetsky, Chief, Public Safety and Homeland Security Bureau); *Reliability of the District's 911 Call System: Hearing Before the D.C. Council Comm. on the Judiciary* (Sept. 20, 2012) (statement of David S. Turetsky, Chief, Public Safety and Homeland Security Bureau); *COG to Review 9-1-1 Outages and Other Failures Resulting from "Derecho,"* METRO. WASH. COUNCIL OF GOV'TS (Jul. 11, 2012), available at http://www.mwcog.org/news/press/detail.asp?NEWS_ID=584..

²⁹ 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, *Public Notice*, 27 FCC Rcd 8131 (PSHSB July 18, 2012) (*Derecho Public Notice*).

³⁰ See *Reliability NOI*, 26 FCC Rcd at 5614.

³¹ See, e.g., Comments of Fairfax County, Virginia, PS Docket No. 11-60, at 18-20 (Aug. 17, 2012) (Fairfax County Comments).

³² See, e.g., Comments of Verizon and Verizon Wireless, PS Docket No. 11-60, at 14 (Aug. 17, 2012) (Verizon Comments).

³³ See *FCC Encyclopedia, Communications Security, Reliability, and Interoperability Council*, FCC, <http://www.fcc.gov/encyclopedia/communications-security-reliability-and-interoperability-council-iii> (last visited Feb. 19, 2013). CSRIC replaces the Network Reliability and Interoperability Council (NRIC), which performed a similar role from 1992 until CSRIC's creation in 2007.

³⁴ The ATIS NRSC "strives to improve network reliability by providing timely consensus-based technical and operational expert guidance to all segments of the public communications industry." See *Network Reliability Steering Committee (NRSC)*, ATIS, <http://www.atis.org/NRSC/index.asp> (last visited Feb. 19, 2013). The NRSC advises the communications industry through developing and issuing standards, technical requirements, technical reports, bulletins, best practices, and annual reports.

backup power in central offices.³⁵ Network monitoring systems also failed, depriving communications providers of visibility into critical network functions.³⁶

12. For example, the 9-1-1 outages in northern Virginia resulted from backup generator failures in two Verizon Communications, Inc. (Verizon) central offices, one of which was the sole monitoring point for dozens of other facilities.³⁷ In that office, two interdependent generators must operate in tandem to provide adequate power, contravening a CSRIC best practice and leading to a complete failure of backup power when one generator failed to start.³⁸ A lack of physical diversity in Verizon's network also contributed to the 9-1-1 outages as single failures isolated large portions of the 9-1-1 network and disabled monitoring functions, preventing repair crews from receiving alarms.³⁹ In West Virginia, Frontier Communications Corp. (Frontier) also experienced generator failures and deficiencies in network redundancy, compromising network monitoring functions and disrupting service to multiple PSAPs.⁴⁰ In most cases, the Bureau concluded, 9-1-1 and other communications problems during the derecho could have been avoided if service providers had followed industry best practices, their own internal policies, and other sound engineering principles, most of which were developed by the industry.⁴¹

13. Many of the vulnerabilities revealed by the derecho hinge on the concept of physical diversity. Under generally accepted definitions, physical diversity means that two circuits follow different paths separated by some physical distance so that a single failure such as a power outage, equipment failure, or cable cut will not result in both circuits failing.⁴² For example, two circuits that ride over the same fiber optic cable are not physically diverse, even though they utilize different fibers in that cable and may be logically diverse for purposes of transmitting data. We seek comment on this definition and any other concept of network diversity we should consider.

14. In the *Derecho Report*, the Bureau detailed the findings of its inquiry and provided recommendations for Commission action to ensure that service providers take appropriate steps to improve the reliability and resiliency of 9-1-1 communications. Noting that service providers have often been encouraged to implement industry-led best practices on a voluntary basis,⁴³ but have not been

³⁵ *Derecho Report* at 1.

³⁶ *See id.* at 18, 21, 40-41.

³⁷ *See id.* at 16-19.

³⁸ *Id.* at 16-17.

³⁹ *Id.* at 18.

⁴⁰ *See id.* at 21, 33-34.

⁴¹ *Id.* at 39-41.

⁴² *See, e.g.,* FCC PUBLIC SAFETY AND HOMELAND SECURITY BUREAU, TECH TOPIC 14: DIVERSITY, REDUNDANCY, AND RESILIENCY - IN THAT ORDER, *available at* <http://transition.fcc.gov/pshs/techtocps/techtocps14.html> ("Route diversity is generally defined as the communications routing between two points over more than one geographic or physical path with no common points.")

⁴³ *See, e.g.,* FCC's Public Safety and Homeland Security Bureau Reminds Telecommunications Service Providers of Importance of Implementing Established 9-1-1 and Enhanced 9-1-1 Services Best Practices, *Public Notice*, DA 12-891, 27 FCC Rcd 6085 (PSHSB rel. June 6, 2012) ("[T]he Bureau reminds telecommunications service providers of the importance of providing diversity and redundancy in the provisioning of 9-1-1/E9-1-1 services") (*2012 Best Practices PN*); *see also* FCC's Public Safety and Homeland Security Bureau Reminds Telecommunications Service Providers of Importance of Implementing Advisory Committee 9-1-1 and Enhanced 9-1-1 Services Best Practices, (continued....)

required to do so by Commission rules, the report recommended that the Commission take action to ensure.⁴⁴

- **Routine 9-1-1 Circuit Auditing:** If service providers do not regularly audit the physical routes of 9-1-1 circuits and ALI links, they may be unaware of avoidable single points of failure in their 9-1-1 networks and unable to identify and correct instances where a single failure could disrupt vital services to PSAPs and the public in an emergency. The Bureau therefore recommended that service providers conduct periodic auditing of 9-1-1 circuits to maintain diversity, with this auditing obligation to extend only to these high-priority circuits. The Bureau’s recommendation did not necessarily encompass a requirement that providers diversify all circuits in particularly expensive areas.⁴⁵ CSRIC Best Practice 8-7-0532 provides that “[n]etwork operators should periodically audit the physical and logical diversity called for by network design and take appropriate measures as needed.”⁴⁶ Seeing data that raised concerns about whether this practice had been implemented, the Bureau has twice issued reminders.⁴⁷ Yet during the derecho, the public experienced the consequences of inadequate diversity of critical circuits, and we believe providers were unaware of information they could have used to avoid this problem because they had not conducted audits for physical diversity
- **Adequate Central Office Backup Power:** As the derecho made clear, reliable central office backup power is essential for communications during large-scale emergencies, and backup power failures in these key facilities can disable 9-1-1 communications services for an entire community. The Bureau therefore recommended the Commission take action to ensure that service providers maintain robust, resilient backup power in central offices, supported by appropriate testing, maintenance, and records retention.⁴⁸ Most service providers recognize the importance of these practices in principle, but they may give way in the daily press of business, with potentially dire consequences.
- **Physical Diversity of Monitor and Control Links:** The derecho revealed how vital it is for 9-1-1 service providers to have physically diverse monitor and control links and capabilities throughout their networks to ensure accurate, timely situational awareness and rapid recovery from outages. The Bureau therefore recommended that service providers maintain physically diverse monitor and control links.⁴⁹
- **Improved PSAP Notification When Outages Affect 9-1-1 Service:** Section 4.9 of the Commission’s rules requires service providers experiencing an outage that potentially affects a

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Public Notice, DA 10-494, 25 FCC Rcd 2805 (PSHSB rel. March 24, 2010) (“[T]he Bureau has observed a significant number of 911/E911 service outages caused by a lack of diversity that could have been avoided at little expense to the service provider”) (*2010 Best Practices PN*).

⁴⁴ See *Derecho Report* at 40-41.

⁴⁵ See *id.* at 40.

⁴⁶ See CSRIC Best Practice 8-7-0532, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-0532>.

⁴⁷ See *2012 Best Practices PN*, *supra* note 43; *2010 Best Practices PN*, *supra* note 43.

⁴⁸ See *Derecho Report* at 40.

⁴⁹ See *Derecho Report*. at 40-41.

PSAP to notify the PSAP “as soon as possible.”⁵⁰ The Bureau recommended that the Commission consider stating with more specificity what is expected of providers, including, for example, acceptable methods of notification and a minimum level of detail in the information provided to PSAPs.⁵¹

15. The Bureau’s report provided additional recommendations for service providers and PSAPs based on lessons learned during the derecho and called for the development of new best practices consistent with sound engineering principles identified in the report.⁵² It also noted the relative advantage in reliability and performance that NG9-1-1 technologies based on an IP architecture will offer compared to the “legacy” 9-1-1 systems affected by the derecho.⁵³

III. DISCUSSION

16. In this *Notice*, we seek comment on actions to improve 9-1-1 network reliability in light of the widespread service outages encountered during the derecho and its aftermath, as well as numerous 9-1-1 outages over the years that have caused us to remind service providers of vital best practices.⁵⁴ As explained in greater detail below, we are considering a number of options to implement the Bureau’s recommendations for Commission action in the *Derecho Report*. Our overarching goal in this portion of the docketed Reliability and Continuity proceeding is to ensure the reliability and resiliency of the 9-1-1 system so that consumers can reach emergency assistance when they need it.

17. While there is some potential difficulty in quantifying specific benefits and burdens of implementing these recommendations, we seek to determine the benefits to consumers and other communications users that would result from each proposal. Our intent is to maximize those consumer benefits while taking into consideration any burden on service providers. We therefore request comment on a range of questions that will help us to weigh the costs and benefits of each approach to strengthening the reliability and resiliency of critical 9-1-1 communications infrastructure. For each cost or benefit addressed, we ask that commenters provide specific data and information such as actual or estimated dollar figures, including a description of how the data or information was calculated or obtained and any supporting documentation.⁵⁵ All comments will be considered and given appropriate weight; vague or unsupported assertions regarding costs or benefits generally will receive less weight and be less persuasive than the more specific and supported statements. We anticipate that many service providers have implemented these recommendations to some degree and, to the extent that they correspond to established best practices, may already budget for the costs of doing so.

A. Need for Commission Action

18. The Commission previously has addressed communications reliability issues by working with service providers to develop voluntary best practices, and by measuring the effectiveness of those

⁵⁰ See 47 C.F.R. § 4.9.

⁵¹ *Derecho Report* at 41.

⁵² See *id.* at 41-43.

⁵³ See *id.* at 43-44.

⁵⁴ See *2012 Best Practices PN*, *supra* note 43; *2010 Best Practices PN*, *supra* note 43.

⁵⁵ To the extent that filers believe that any of this information could be considered confidential, please see instructions for filing materials under a claim of confidentiality, *infra*, ¶ 85.

best practices through outage reporting. The outage reporting process has often been effective in improving the reliability, resiliency, and security of many communications services. The June 2012 *derecho*, however, revealed the limits of that approach and highlighted the potential benefits and importance of supplementing a voluntary approach with respect to critical 9-1-1 communications. Although many 9-1-1 service providers have participated in industry efforts to develop best practices related to critical circuit diversity, backup power, and other vital topics, the *Derecho Report* found that multiple 9-1-1 service providers failed to implement those practices effectively or at all, leading to emergency communications outages affecting millions of Americans.⁵⁶ Furthermore, despite the Commission's current outage-reporting requirements, multiple PSAPs did not receive timely or adequate notification of these outages, compounding the difficulty of providing emergency assistance until service was restored.⁵⁷ These failures could have been prevented, and the Commission has a statutory mandate to ensure that its rules and policies advance public safety objectives.⁵⁸

19. We therefore seek comment on the extent to which 9-1-1 failures during the *derecho* reflect the reliability of 9-1-1 networks nationwide. Why would PSAPs located in other parts of the Nation be more or less vulnerable to the effects of a storm like the *derecho*? To what extent have service providers affected by the *derecho* addressed vulnerabilities revealed by the storm, both in the affected region and across their entire service areas? What specific remedial actions have these service providers taken, particularly with respect to critical circuit auditing, functional central office backup power, and diversity of monitoring links, and when were those actions completed? Has the experience of the *derecho* caused other 9-1-1 service providers to reexamine their network architecture and maintenance practices, and what have those efforts revealed about the reliability and resiliency of the Nation's 9-1-1 infrastructure as a whole? What changes have been made to improve 9-1-1 reliability and resiliency? What assurance does the Commission have that these changes will persist?

20. Although we intend the approaches in this *Notice* to complement and strengthen – not to replace – the Commission's current approach to network reliability, we seek comment on the appropriate balance between voluntary best practices and Commission mandates as they relate to 9-1-1 communications. Some commenters have suggested that the best way to ensure a reliable and resilient 9-1-1 network is to develop new or modified best practices based on lessons learned in the *derecho*, rather than adopt any rules in the wake of the *derecho* and its lessons.⁵⁹ In light of the many existing best practices addressing these issues and service providers' failure to implement them fully, however, we seek comment on whether there is any assurance that additional voluntary best practices would necessarily lead to effective and consistent compliance without additional Commission action, especially after such dangerous failures potentially affected millions of people. The *Derecho Report* noted that multiple 9-1-1 service providers implemented best practices to varying degrees, or adopted key best practices in theory, with substantial exceptions in day-to-day operation.⁶⁰ To what extent are network reliability best practices, particularly those regarding physical auditing of critical circuits, functional and

⁵⁶ See *Derecho Report* at 39-41.

⁵⁷ See *id.* at 29, 41.

⁵⁸ See 47 U.S.C. §§ 151, 154(o).

⁵⁹ See Verizon Comments at 14-15.

⁶⁰ See *Derecho Report* at 17-18, 32-34. For example, one 9-1-1 service provider reported that despite an internal policy requiring testing of generators under actual site load, it had suspended site-load testing in a key central office for at least several months before the *derecho*. Another service provider apparently recognized the importance of diverse network monitoring links, but disconnected a redundant circuit several days before the storm and failed to reconnect it.

well-maintained central office backup power, and diversity of network monitoring links, followed today? What evidence exists that they are followed? What circumstances might lead to these best practices not being followed? What measures can be taken to compensate for the failure to implement a best practice so that 9-1-1 reliability is not impaired? What evidence exists to substantiate that these measures are taken routinely when best practices are not followed? What incentives do service providers have to implement best practices, and are those incentives sufficient? Beyond general agreement with best practices, what assurances can 9-1-1 service providers make to ensure rigorous implementation on a nationwide basis?

21. Which advisory bodies do service providers look to for guidance regarding best practices, *e.g.*, CSRIC, ATIS, Association of Public-Safety Communications Officials (APCO), National Emergency Number Association (NENA), or other organizations? What best practices are followed today other than those adopted by CSRIC? What relevant industry standards are followed routinely? If so, are they preferred over the best practices adopted by CSRIC? What evidence exists that these standards are routinely followed? How do they differ from the best practices issued by CSRIC? For example, are there specific regional circumstances that would make it more difficult or expensive to perform critical circuit auditing? Do service providers take measures to compensate for failing to implement the best practice in these instances? What evidence exists to substantiate that these measures are actually taken? Should certain best practices be considered critical for some parts of the country and not others? If existing best practices have proven difficult for service providers to implement or inadequate to prevent communications outages, what can be done to update or revise those practices to reflect lessons learned in the derecho? Which best practices, specifically, should be added or expanded, and would such changes make service providers more likely to comply in the future?

22. As the Bureau observed, “[t]he public’s inability to reach 9-1-1 and obtain emergency assistance during and after the derecho was not just a theoretical or abstract concern.”⁶¹ Indeed, the ability to call 9-1-1 during a disaster, medical emergency, or other time of need may literally make the difference between life and death. Because the public’s need for emergency response is particularly acute during natural disasters, severe weather cannot by itself excuse failures in a 9-1-1 network that should be designed to withstand such events, even when they arrive unexpectedly. A broad range of comments from state and local governments, as well as public safety entities themselves,⁶² support the Bureau’s finding that such failures are unacceptable, and that additional Commission action is warranted – particularly if the rate of failure in the region affected by the derecho reflects vulnerabilities in 9-1-1 infrastructure nationwide. Although NG9-1-1 will enhance 9-1-1 reliability, the circuit-switched system will be in use for quite some time. We therefore seek comment on the relevance of the transition to NG9-1-1, as it relates to the need for Commission action in this proceeding, and the approaches contemplated in the Commission’s recent report to Congress with respect to this transition.⁶³

B. Entities Subject to Proposals

23. We seek comment on the class of entities to which the proposals put forward for

⁶¹ *Derecho Report* at 4.

⁶² *See id.* at 39-41; Fairfax County Comments at 29; VA. STATE CORP. COMM’N, IN THE MATTER OF INVESTIGATING 911 EMERGENCY CALL SERVICE OUTAGES AND PROBLEMS, CASE NO. PUC-2012-0042, STAFF REPORT OF PRELIMINARY FINDINGS 8 (2012) (Virginia SCC Report); METRO. WASH. COUNCIL OF GOV’TS 9-1-1 TELECOMMUNICATIONS NETWORK STEERING GROUP, PRELIMINARY REPORT OF 9-1-1 SERVICE GAPS DURING AND FOLLOWING THE DERECHO STORM ON JUNE 29, 2012, 15-17 (2012) (MWCOG Report).

⁶³ *See* NG9-1-1 Legal Framework Report, *supra* note 11.

consideration in this *Notice* would apply. Throughout this *Notice* we use the term “9-1-1 service provider,” defined in the *Derecho Report* as a communications provider “responsible for routing and delivering 9-1-1 calls to PSAPs.”⁶⁴ These providers are typically ILECs, though as the Bureau explained, the transition to NG9-1-1 may broaden the class of entities that perform this function.⁶⁵ Accordingly, we seek comment on defining the term “9-1-1 service provider.” We anticipate that the proposals in this *Notice* would apply to all 9-1-1 service providers, and tentatively define that term to include all entities, including ILECs, that provide 9-1-1 call routing, ALLI, emergency services Internet protocol networks (ESInets), and similar services directly to a PSAP.⁶⁶ Is that definition sufficient to capture all the entities that both now and in the future could provide functions necessary to the provision of such services to a PSAP?⁶⁷ If not, how should this term be defined? For example, should any of the proposals apply to other types of wireline service providers, wireless service providers, interconnected VoIP service providers, or other potential means of reaching a PSAP as NG9-1-1 broadens the range of entities capable of delivering 9-1-1 service? Should reliability standards or certification requirements extend to data centers and other facilities that may in the future be used to host NG9-1-1 components? Are there certain proposals from which non-ILEC service providers should expressly be exempt? To the extent that any of the implementation approaches would impose obligations on entities regulated as common carriers under Title II of the Communications Act, should there be a mechanism for cost recovery beyond the 9-1-1 related tariff mechanisms already in place?

C. Implementation Approaches

24. In this section, we seek comment on four possible approaches to implement the recommendations for Commission action in the *Derecho Report*. We seek input on whether each of these approaches can stand alone, or whether the Commission should adopt two or more options as part of an integrated approach (*e.g.*, reporting, certification, performance reliability requirements). As noted above, these proposals are intended to complement, rather than to replace, the Commission’s current support for implementation of best practices developed through cooperation with industry and advisory bodies. We also seek comment on the suitability of each of the approaches described in Section D below, as well as any other approaches the Commission should consider. However the Commission decides to proceed, a meaningful level of specificity is essential for any approach to be effective. We therefore seek comment on the suitability of existing best practices as a basis for any rules we may adopt.⁶⁸ Although each

⁶⁴ *Derecho Report* at 9, n.23.

⁶⁵ *See id.*

⁶⁶ One proposed revision to the Commission’s outage reporting rules could affect a broader range of service providers currently required to notify PSAPs of outages that potentially affect a “911 special facility.” *See* 47 C.F.R. § 4.9(a)(4) (cable providers); 47 C.F.R. § 4.9(c)(2)(iv) (satellite providers); 47 C.F.R. § 4.9(e)(5) (wireless providers); 47 C.F.R. § 4.9(f)(4) (wireline providers) 47 C.F.R. § 4.9(g)(i) (interconnected VoIP providers). For further detail, *see infra* ¶¶ 67-74.

⁶⁷ *See* Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications; Framework for Next Generation 911 Deployment, PS Docket Nos. 11-153 and 10-255, *Notice of Proposed Rulemaking*, FCC 11-134, 26 FCC Rcd 13615, 13663-64, ¶ 119 (2011), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-134A1.pdf. (discussing role of entities including System Service Providers (SSPs), non-interconnected VoIP providers, and “broadband access providers, network operators, and other entities involved in the provision of broadband Internet access” in routing calls in a NG9-1-1 environment); *see also* NG9-1-1 Legal Framework Report, *supra* note 11, at 11 (noting that “[w]ith NG911 . . . network servers can be located and replicated anywhere, and 911 traffic can be transmitted over multiple IP-based networks, including networks that carry other traffic as well”).

⁶⁸ We pose this question in light of our understanding that service providers may currently implement best practices to varying degrees. The *Derecho Report*, for example, noted that one 9-1-1 service provider largely avoided (continued....)

proposal is intended to be flexible, commenters should describe in detail how they propose to implement their preferred approach and how those choices would advance the goals of this *Notice*.

25. We specifically seek comments from state commissions and PSAPs on the approaches they use to oversee 9-1-1 connectivity. Many states, for example, regulate 9-1-1 service provided by ILECs. Do those states use a reporting approach? Onsite audits? Do PSAPs that contract for 9-1-1 services impose certification or similar requirements upon their 9-1-1 service providers? Do they specify levels of reliability through service level agreements (SLAs) or require adherence to best practices? Are such SLAs negotiated at the PSAP, state, or service-provider level, and what level of 9-1-1 service do they provide? What have state commissions and PSAPs found to work in their oversight of 9-1-1 service providers, and what needs to be improved?

26. *Reporting.* Under this approach, the Commission would require service providers to periodically report on the extent to which they are voluntarily implementing critical best practices,⁶⁹ or complying with applicable standards established by the Commission. For instance, a provider could report on whether or not it performs 9-1-1 circuit audits, what exactly it does, the frequency of those audits, and any remedial actions it plans to take in response to its most recent audit.⁷⁰ By way of further example, a provider could report on whether all of its backup power arrangements for central offices comply with CSRIC best practice 8-7-5281 regarding interdependent generators,⁷¹ and, if not, what steps it is taking to comply with or to compensate and achieve the reliability sought by the practice. Would adoption of this reporting approach alone or as part of an integrated approach meet the goal of ensuring 9-1-1 reliability? What costs and benefits would such a reporting obligation create? Which best practices or other standards should be subject to reporting requirements, and are these standards sufficiently detailed to objectively evaluate compliance? To what extent would such a reporting obligation be effective in the absence of a companion requirement to correct deficiencies revealed in the reports? What performance level should the Commission use to prompt remedial actions based on these reports? Commenters offering support for this approach should specify the scope, granularity, and frequency of reporting they support.

27. We note that the Commission has used reporting in the past as a means of ensuring a certain level of reliability in 9-1-1 services. In 2007, in response to Hurricane Katrina, the Commission adopted rules requiring local exchange carriers, wireless service providers subject to 9-1-1 requirements,

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centralized automatic message accounting (CAMA) trunk failures by implementing recommendations from the ATIS NRSC, while another service provider implemented these recommendations to a lesser extent and experienced some loss of service. *See Derecho Report* at 11, 32-33. Although both service providers asserted that they had taken steps to comply with the recommendations, the Bureau concluded that full implementation would have led to fewer 9-1-1 trunks being removed from service. *See id.* at 33.

⁶⁹ We note that CSRIC and its predecessor NRIC categorize best practices by priority level based on whether implementation of the practice is considered critical, highly important or important. *See* NRIC Best Practices, <https://www.fcc.gov/nors/outage/bestpractice/BestPractice.cfm>. These priority levels could inform any framework that the Commission chooses to adopt.

⁷⁰ CSRIC Best Practice 8-7-0532 provides that “Network Operators should periodically audit the physical and logical diversity called for by network design and take appropriate measures as needed.” *See supra*, note 46.

⁷¹ CSRIC Best Practice 8-7-5281 provides that “Network Operators, Service Providers and Property Managers with buildings serviced by more than one emergency generator, should design, install and maintain each generator as a stand alone unit that is not dependent on the operation of another generator for proper functioning, including fuel supply path.” CSRIC Best Practice 8-7-5281, *available at* <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-5281>.

and interconnected VoIP service providers “to conduct an analysis of the resiliency and reliability of their 911 networks or systems and to submit a report to the Commission.”⁷² The Bureau implemented this rule in 2009 by requesting information on 9-1-1 architecture in the United States.⁷³ The reports proved of limited use, however, because they lacked the specificity necessary to determine network reliability in individual cases. For example, the reports did not provide sufficient information to assess whether 9-1-1 service providers were implementing diversity in their routing of 9-1-1 circuits for PSAPs in major metropolitan areas. In light of this experience, we invite commenters to address how to craft a reporting requirement that would more effectively promote reliability of 9-1-1 services and networks and create incentives for service providers to maintain consistently high standards of 9-1-1 reliability.

28. *Certification.* Under this approach, the Commission would require providers to certify periodically that their 9-1-1 network service and facilities comply with voluntary industry best practices, reliability requirements specified by the Commission or other standards.. This approach could help ensure that senior management is aware of significant vulnerabilities in the 9-1-1 network and accountable for its decisions regarding design, maintenance, and disaster preparedness. For instance, a provider might certify that it has audited the physical diversity of its network and taken appropriate measures as needed,⁷⁴ or that it has identified and corrected any instances where failure of a single backup generator would cause multiple interdependent generators to fail.⁷⁵ To what extent would such a certification obligation be effective in the absence of a companion requirement to correct deficiencies revealed in the certification? Are existing best practices sufficiently detailed to serve as standards for certification? What performance level should the Commission use to prompt remedial actions based on these certifications? With respect to this approach, we seek comment on existing certification schemes—whether or not directly related to the work of the Commission—that might serve as models for certification in this context.

29. Do existing Commission certification schemes provide an appropriate model for addressing 9-1-1 reliability? For example, do the certification schemes for Consumer Proprietary Network Information (CPNI) under Section 64.2009(e) of the Commission’s rules,⁷⁶ or the Equal

⁷² See In the Matter of Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, EB Docket No. 06-119, WC Docket No. 06-63, Order, 22 FCC Rcd 10541, 10572, ¶ 99 (2007). This requirement was codified in Part 12 of the Commission’s rules, and delegated authority to the Bureau to establish the specific data required in each report, but provided that “these reports should include descriptions of the steps the service providers intend to take to ensure diversity and dependability in their 911 and E911 networks and/or systems, including any plans they have to migrate those networks and/or systems to a next generation Internet Protocol-based E911 platform.” 47 C.F.R. § 12.3(a).

⁷³ See FCC’s Public Safety and Homeland Security Bureau Announces the Activation of the E911 Architecture Information System; Carriers Required to File Reports with Commission on 911/E911 Networks, Systems by February 6, 2009, *Public Notice*, DA 08-2263, 23 FCC Rcd 14757 (PSHSB 2008); In the Matter of Implementation of Section 12.3 of the Commission’s Rules, DA 09-1077, *Protective Order*, 24 FCC Rcd 5657 (2009) (Section 12.3 Protective Order) (noting that the Commission would share reports with certain public safety organizations subject to a presumption of confidentiality).

⁷⁴ See CSRIC Best Practice 8-7-0532, *supra* note 46.

⁷⁵ See CSRIC Best Practice 8-7-5281, *supra* note 71.

⁷⁶ See 47 C.F.R. § 64.2009. Under the Commission’s CPNI certification model, an officer of the telecommunications provider acting as its agent is required to sign and file the certification. The certification must include: a) a statement that the officer has “personal knowledge” that the company has established operating procedures that adequately ensure compliance with the CPNI rules; b) a statement that explains how its operating procedures ensure compliance (or non-compliance) with the CPNI rules; c) an explanation of actions taken against (continued....)

Employment Opportunity (EEO) reports⁷⁷ filed by broadcast stations and multi-channel video program distributors (MVPDs) under Sections 73.2080 and 76.75 of the Commission's rules provide a model for addressing 9-1-1 reliability? Why or why not? What are the tradeoffs among the various models? What costs and benefits would be associated with each? Is there sufficient justification for the Commission to adopt a new certification model? If so, why? Would one possible model be found in Section 302 of the Sarbanes-Oxley Act, which requires Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs) to certify the integrity of financial reports their companies submit to the Securities and Exchange Commission?⁷⁸ If so, which portions of certification under Sarbanes-Oxley are suitable for certifications in this context, and are there others that are not suitable? For example, as under Sarbanes-Oxley, should corporate officers be personally liable for the accuracy of their certifications, and how would the Commission enforce such a requirement? What costs and benefits would be associated with this model?

30. *Reliability Requirements.* Under a third approach the Commission would specify minimum standards for 9-1-1 communications reliability, based on recognized industry best practices. For instance, the Commission could require service providers to maintain a minimum, specified level of physical diversity for their 9-1-1 circuits in compliance with CSRIC Best Practice 8-7-0532⁷⁹ or to replace or redesign interdependent backup generators that violate CSRIC Best Practice 8-7-5281.⁸⁰ The Commission could also require specified best practices to serve as default standards, unless service

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data brokers; and d) a summary of all customer complaints received in the last year relating to the unauthorized release of CPNI. Covered entities that fail to file a required certification face enforcement action, which can include a fine of up to \$150,000 per violation, or per day if there is a continuing violation, for a maximum of \$1,500,000. False or misleading statements are subject to criminal liability under Title 18 of the U.S. Code. *See* 18 U.S.C. § 1001(a).

⁷⁷ *See* 47 C.F.R. §§ 73.2080, 76.75. While such filings may be signed by any corporate officer, broadcast stations must designate a specific individual responsible for their EEO programs. *See* Commission Form 396, *available at* <http://transition.fcc.gov/Forms/Form396/396.pdf>. Under the Commission's EEO certification model, MVPDs must certify their employment practices by filing Form 396-C, which requires a company official to state whether the MVPD's operating procedures ensure compliance (or non-compliance) with the EEO requirements set forth in 47 U.S.C. § 554 and 47 C.F.R. § 76.75(b). *See* Commission Form 396-C, *available at* <http://transition.fcc.gov/Forms/Form396C/396c.pdf>. If the official answers in the negative, then that official must attach an explanation for the lapse. The certification form asks for details such as whether the MVPD: conducted a continuing review of job structure and employment practices; engaged in broad and inclusive outreach; analyzed the results of efforts to recruit, hire, promote, and use services in a nondiscriminatory manner and used those results to evaluate and improve the EEO program; and defined the responsibility of each level of management to ensure a positive application and vigorous enforcement of its policy of equal employment opportunity and maintain a procedure to review and control managerial and supervisory performance. The MVPD must retain documentation necessary to demonstrate performance of the requirements and initiatives, and the official must attach a copy of the previous year's public EEO file.

To enforce these provisions, at least once every five years the Commission investigates the employment practices of each MVPD in the aggregate and in individual components to determine if the entity is in compliance. The Commission also compares the entity's actual practices with the annual reports it filed. MVPDs that fail to implement EEO requirements face forfeitures detailed in 47 C.F.R. § 1.80. For specific requirements for MVPDs, see 47 U.S.C. § 554(f)(2). A forfeiture assessed for any continuing violation shall not exceed a total of \$1,000,000 for any single act or failure to act. False or misleading statements are subject to criminal liability under Title 18 of the U.S. Code. *See* 18 U.S.C. § 1001(a).

⁷⁸ *See* 15 U.S.C. § 7241(a).

⁷⁹ *See* CSRIC Best Practice 8-7-0532, *supra* note 46.

⁸⁰ *See* CSRIC Best Practice 8-7-5281, *supra* note 71.

providers can demonstrate an appropriate exception from those requirements. As discussed in more detail below, we seek comment on how any such requirements should be crafted, as well as their costs and benefits. Specifically, we seek comment on whether existing best practices are sufficiently detailed to serve as standards for compliance and potential enforcement. How can the Commission ensure that any such requirements account for sound engineering practices not specifically codified as CSRIC best practices, particularly as technologies evolve? Are there differences in the design and operation of particular 9-1-1 networks that the Commission should consider in connection with sound engineering and network reliability standards, and which may not be reflected fully in existing best practices?

31. *Compliance Reviews and Inspections.* Under this approach, the Commission would conduct periodic compliance reviews or site inspections of service provider facilities to verify that 9-1-1 service providers are adhering to certain standards. This approach may be best suited as part of an integrated approach, in conjunction with rules setting minimum standards for compliance. We seek comment on this option, as well as any benefits or costs of this approach. Which service providers should be subject to inspections or compliance reviews, and how often should those inspections occur? Should reviews be limited to records and documentation of compliance with Commission requirements, or should they include physical site inspections of network routes? Would this approach require additional staff, both at the Commission and employed by service providers, to conduct inspections and document compliance? If so, what experience and training would these personnel require, and would they be likely to detect network design and maintenance issues such as those that led to 9-1-1 failures during the *derecho*?

D. Bureau Recommendations for Improving 9-1-1 Network Reliability

32. In this section we seek comment on proposals to implement recommendations for Commission action set forth in the *Derecho Report*. As explained above, for each recommendation we seek comment on a range of possible implementation approaches. We also seek comment on the relative costs and benefits of the various proposals. We also seek comment on any alternative proposals that may be more effective or efficient in improving 9-1-1 network reliability or resiliency. In evaluating specific proposals for Commission action, we also seek comment on how we can best work in cooperation with state, tribal, and local governments, which we have recognized “are the primary administrators of the legacy 911 system.”⁸¹ Although the exercise of state or local authority over emergency communications may not be “inconsistent with Federal law or Commission requirements,”⁸² we have long worked cooperatively with such governmental entities in discharging our responsibilities to ensure that emergency communications “promot[e] safety of life and property.”⁸³

33. For each of the proposals, we specifically seek comments from state commissions and PSAPs on the approaches they use to oversee 9-1-1 connectivity. Do states, for example, require routine 9-1-1 circuit auditing? Why or why not? What backup power or network monitoring requirements have PSAPs requested or required from their 9-1-1 service providers? How have state commissions and PSAPs approached notifications from 9-1-1 service providers? How specific or general are the requirements that state commissions and PSAPs have imposed? Do the obligations imposed by state commissions or PSAPs differ based on geography, topography, and/or other factors? What have state

⁸¹ In the Matter of Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications, *Notice of Proposed Rulemaking*, 26 FCC Rcd 13615, 13660, ¶ 115 (2011).

⁸² 47 U.S.C. § 615a-1(d).

⁸³ 47 U.S.C. § 151.

commissions and PSAPs found to work in their oversight of 9-1-1 service providers, and what needs to be improved?

1. Routine 9-1-1 Circuit Auditing

34. It is axiomatic within the telecommunications industry that network operators should periodically audit the physical and logical diversity called for by sound network design and take appropriate measures as needed.⁸⁴ Since 2010, the Bureau has twice reminded service providers of the importance of physical diversity in 9-1-1 networks.⁸⁵ The inquiry that led to the *Derecho Report* demonstrated that a number of telecommunications providers and network operators have either not considered, or not properly and consistently implemented, this vital maintenance action. As the *Derecho Report* noted, for example, a physical diversity audit might have revealed vulnerabilities that led to 9-1-1 and ALI service failures to multiple PSAPs in Northern Virginia.⁸⁶ To what extent does this experience reflect vulnerabilities in 9-1-1 networks nationwide? Do 9-1-1 service providers perform regular, physical audits – not just logical analyses – of critical circuits to ensure that their networks remain physically diverse? If so, what specifically do they do and how often? What steps are taken to ensure that physical diversity is sustained despite the circuit rearrangements that frequently take place in communications networks?

35. As a result of service providers' inconsistent auditing of 9-1-1 circuits and avoidable single points of failure in their networks, the *Derecho Report* recommended regularly-scheduled auditing of these circuits, noting that it "should lead to fewer 9-1-1 outages and enhance the reliability of 9-1-1 communications. If providers do not regularly audit the physical routes of 9-1-1 circuits and ALI links, they will be ill-equipped to verify diversity and understand, avoid, or address instances where a single failure causes loss of all E9-1-1 circuits or all ALI links for a PSAP."⁸⁷ Are there instances where single points of failure are unavoidable, and how should that term be defined? The *Derecho Report* concluded that the benefits of implementing this recommendation will likely outweigh any additional costs, given the large numbers of customers that can be served successfully in emergencies by circuits that are diverse, and the harms that could result from avoidable failures. The Bureau added that any burden likely would be modest because this obligation would apply only to a limited number of high-priority circuits that provide 9-1-1 service.⁸⁸

36. In light of providers' apparent failure to audit circuit diversity adequately, notwithstanding pre-existing best practices bolstered by Bureau reminders, we seek comment in general on the extent to which providers are auditing these circuits and whether those audits follow established best practices. Do existing best practices provide sufficient guidance on this topic? If not, what, specifically, should new or revised best practices address? Following the *derecho*, the two ILECs most affected by the storm – Frontier and Verizon – each pledged to take corrective action. Specifically, Frontier stated it will audit 9-1-1 circuits for diversity,⁸⁹ while Verizon indicated it is making valuable

⁸⁴ See CSRIC Best Practice 8-7-0532, *supra* note 46.

⁸⁵ See 2012 Best Practices PN, *supra* note 43; 2010 Best Practices PN, *supra* note 43.

⁸⁶ See *Derecho Report* at 32; Virginia SCC Report at 10 (noting "profound" loss of transport systems in Arlington and Fairfax central offices affecting 9-1-1 and ALI links).

⁸⁷ See *Derecho Report* at 40.

⁸⁸ See *id.*

⁸⁹ See *id.* at 24 (citing Comments of Frontier Communications Corp., PS Docket No. 11-60, at 6-7 (Aug. 17, 2012)).

progress on the auditing of 9-1-1 circuits in some areas and intends to apply this practice where it has not yet done so.⁹⁰ How, if at all, do such pledges affect whether we should take additional action to ensure implementation of this recommendation?⁹¹ For example, does this suggest that the cost of following the best practice is reasonable and that the cost of the four alternative regimes proposed in this *Notice*, particularly reporting and certification, should not be prohibitive while providing significant assurance of actual compliance? What remedial actions have other 9-1-1 service taken based on lessons learned in the derecho, whether or not they were directly affected by the storm?

37. How, when, and to what degree of specificity should network diversity audits be conducted? Under current technologies, critical 9-1-1 circuits include, at a minimum, 9-1-1 trunks to PSAPs and ALI/ANI links, but we seek comment on other transport routes or technologies that may also be vital for emergency response, now or in the future. Although some network characteristics may vary by service provider and location, any auditing obligation must be specifically defined to be effective. Should the Commission therefore adopt rules prescribing in some fashion how audits should be conducted, and should it conduct inspections or compliance reviews to enforce any such rules? How frequently should audits be conducted, and are there existing published industry standards that could serve as a model? Should the Commission require not only that service providers perform audits, but also that they take action to eliminate reasonably avoidable single points of failure? If so, should any single point of failure be considered unavoidable? Should the Commission require that audits be performed by independent experts or conduct periodic compliance reviews or formal inspections as a means of ensuring compliance? Are there complicating factors in performing diversity audits that the Commission should take note of? To what extent do leased circuits affect the ability to perform accurate audits? How would diversity be sustained despite normal circuit rearrangements and grooming?

38. How can the Commission ensure that its guidance regarding transport network diversity remains current as technology changes? For example, in a NG9-1-1 environment, it is likely that at least some crucial servers will be hosted outside of central offices, in either commercial or government data centers. In those cases, should the Commission ask or require such data centers to meet physical diversity standards or certify that they conduct diversity audits? Would it be sufficient if all such servers are backed up by a redundant hot standby server in another data center? Would conformance with the higher tiers of the ANSI/TIA-942 standard⁹² be suitable for qualifying data centers to host critical NG9-1-1 components?

39. Should the Commission require service providers to file reports describing how they conduct these audits, the results of the audits, and what remedial action they plan to take? Should the reports be based on conformance with best practices, or other standards specified by the Commission? How would such a reporting obligation advance the overarching goal of improved 9-1-1 reliability? How often should reports be filed, and what factors affect this determination? For example, should the Commission require annual reporting? What specific information should be included in these reports, and

⁹⁰ See *id.* at 23 (citing Verizon Comments at 5-6).

⁹¹ In response to the derecho failures, Verizon has recently improved its circuit-auditing program in the Potomac Region and plans to make similar improvements nationwide. Specifically, Verizon has automated its ability to analyze the diversity of 9-1-1 circuits, and it plans to deploy a “lockdown” feature that will prevent designated circuits from being rearranged. See Maureen Davis, VP Network Operations Mid-Atlantic Region, Verizon, Presentation to the Metropolitan Washington Council of Governments: Verizon, 911 Service and the Derecho, Moving Forward, Corrective Actions Update (Jan. 28, 2013) (Verizon Presentation to MWCOG).

⁹² See Telecommunications Infrastructure Standards for Data Centers, TIA-942, *available at* <http://www.tiaonline.org>.

how granular should they be? Should such reporting be limited to factual discussion of existing practices, schedules, and results, or should providers also report on any planned or ongoing efforts to improve 9-1-1 circuit auditing? How does the transition to broadband, IP-based networks affect the ability to conduct accurate audits? Is a reporting requirement the best approach for ensuring that providers perform 9-1-1 audits? We also seek comment on whether reports should be made publicly available. Should they be treated as confidential, absent a persuasive contrary showing, as with outage reports?⁹³ Do commenters believe any such reports should be shared within the PSAP community, or made accessible to 9-1-1 industry associations (e.g., APCO, NENA)?⁹⁴ Should the reports be shared with state regulators such as state public utilities commissions?⁹⁵

40. We also seek comment on whether providers should certify that they are performing 9-1-1 circuit audits in conformance with best practices, and if so, how often they should so certify. If the Commission were to pursue the certification approach, to which standards should providers be required to certify? Do existing standards or guidance serve as a usable template? Beyond certifying that they have conducted an audit, what other information should service providers need to certify? For example, should they conduct audits under generally-accepted procedures reflected in best practices? Should providers certify that the circuits audited satisfied specified criteria for physical diversity and identify and describe exceptions in some fashion? How often should providers be required to file any such certifications, and how granular should they be? Should any certification requirement be accompanied by an obligation to correct deficiencies revealed by diversity audits?

41. We also seek input regarding additional costs, if any, that would accrue to providers in implementing requirements associated with this recommendation through any of the approaches noted above (i.e., reporting, certification, performance requirements). According to the FCC Master PSAP Registry, there are almost 7,000 PSAPs in the United States. Based on our preliminary discussions with stakeholders, we estimate that circuit audits would be necessary for roughly half of these PSAPs because that is the portion likely to be served by more than one selective router. How accurate is this estimate? When a PSAP is served by only one selective router, the service provider already knows there is only one circuit path to that PSAP without the need for an audit. If it takes 16 hours on average to conduct a diversity audit, and the cost is \$80 per hour, the average cost would be \$1,280 per audit.⁹⁶ Is this a reasonable estimate of the time and hourly cost to complete a diversity audit? If not, what would a more reasonable estimate be, and how is it arrived at? Would this work be performed by existing service provider personnel, or would it require additional employees or contractors? If 50 percent of PSAPs served by more than one selective router currently do not have 9-1-1 circuit audits conducted periodically (for these purposes, within the last two years) on the circuits connected to them (i.e., roughly 1,750 PSAPs), the incremental cost incurred to perform the additional audits annually for all of the PSAPs where they are not being performed at regular intervals, under the foregoing assumptions, would be

⁹³ See 47 C.F.R. § 0.457(d)(1)(vi).

⁹⁴ See 47 C.F.R. § 12.3(c) (stating that previous reports filed on redundancy, resiliency, and reliability of 9-1-1 networks will only be shared with NENA, APCO, and National Association of State 9-1-1 Administrators pursuant to a protective order); *Section 12.3 Protective Order*, *supra* note 73, at 5657, ¶ 1.

⁹⁵ See Comments of California Public Utilities Commission, PS Docket No. 11-60 (filed Aug. 17, 2012). We note that the California PUC has filed a pending petition to allow state regulators direct access to NORS outage reporting data. See California Public Utilities Commission, *In re New Part 4 of the Commission's Rules Concerning Disruptions to Communications, Petition for Rulemaking*, ET Docket No. 04-35, RM 11588, DA 10-220 (Nov. 12, 2009).

⁹⁶ 16 * \$80 = \$1,280

roughly \$2.2 million. Is this a reasonable estimate? Does it take account of all relevant costs? We anticipate that the cost of performing diversity audits after the initial audit will decrease over time as service providers become more familiar with the process and more likely to keep current records of network routing.

42. How sensitive is the weighing of incremental costs and benefits to the accuracy of these cost estimates, in light of the likelihood of decreased mortality risk? The U.S. Department of Transportation (DOT) has recently attempted to establish one measure of the “valuation of a statistical life” (VSL) and determined that \$6.2 million was a fair estimate of the value of reduction in mortality risk associated with one human life.⁹⁷ The VSL, however, is a complex calculation, and it is important in any regulatory decision-making process that the agency make clear the processes and assumptions for arriving at such valuations.⁹⁸ A review by the Office of Management and Budget (OMB) Office of Information and Regulatory Affairs comparing similar valuations by the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Food and Drug Administration (FDA), and others has “not found recent values below \$6 million or above \$9.5 million” in current dollars.⁹⁹

43. The Bureau found that uniform use of regular circuit audits likely would result in a decreased mortality risk nationwide. In light of the potential risks of mortality associated with storms like the June 2012 derecho and their effects on 9-1-1 communications,¹⁰⁰ how likely is it that the incremental

⁹⁷ See Memorandum from Polly Trottenberg, Assistant Secretary for Transportation Policy, U.S. Dep’t of Transp. and Robert S. Rivkin, General Counsel, U.S. Dep’t of Transp., to Secretarial Officers and Modal Administrators, U.S. Dep’t of Transp., Treatment of the Economic Value of a Statistical Life in Departmental Analysis - 2011 Interim Adjustment (July 29, 2011) (DOT Statistical Life Valuation). A copy of this memorandum has been included in the docket, and we use it as a basis for cost/benefit calculations throughout this *Notice*.

⁹⁸ See, e.g., Recommendations of the Administrative Conference Regarding Administrative Practice and Procedure and Correction, 53 Fed. Reg. 39,586 (Oct. 11, 1988) (“Recommendation 88-7, Valuation of Human Life in Regulatory Decisionmaking, calls on agencies to reveal publicly the processes through which they determine the value of human life in making policy decisions.”).

⁹⁹ OMB OFFICE OF INFO. & REGULATORY AFFAIRS, 2011 REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES (2011), at 18 n.20; see also OMB OFFICE OF INFO. & REGULATORY AFFAIRS, 2012 DRAFT REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 17 n.19 (2012) (citing a range of studies that estimated VSL between \$1.2 million and \$12.2 million in 2010 dollars but noting that agencies tend to use a value that exceeds the midpoint of the range, *i.e.*, greater than \$6.7 million in 2010 dollars).

¹⁰⁰ A 2002 study of 9-1-1 calls in Pennsylvania found that, when precise location information was provided contemporaneously with a 9-1-1 call, response time was notably shortened and correlated with a 34 percent reduction in mortality rates from cardiac arrest within the first 48 hours following the incident. Specifically, the study examined 19,746 ambulance rides resulting in an emergency hospital admission in 66 Pennsylvania counties during 1994 and 1996. It found a -.012 reduction in the 48-hour mortality rate for cardiac patients due to E9-1-1. It found a life-saving benefit from improved response time in 304 of these cardiac incidents each year per 273,000 population. This implies that E9-1-1 adoption resulted in 3.648 (*i.e.* -.012 * 304) lives saved per 273,000 people. See Susan Athey & Scott Stern, THE IMPACT OF INFORMATION TECHNOLOGY ON EMERGENCY HEALTH CARE OUTCOMES, Jan. 2002, available at <http://kuznets.fas.harvard.edu/~athey/itemer.pdf> (last visited Feb. 19, 2013) (Cardiac Study).

The study’s Pennsylvania results, if representative of all states, would imply there are 341,000 cardiac incidents nationwide each year and a saving of 4,142 lives per year nationwide (*i.e.*, $3.648/273,000 * 310,000,000 = 4,142$). This would further imply that, if storms cause as much as 1.25 percent of the nation’s population to have such delayed access to 9-1-1 for one week each year, the expected annual saving would be at least one life (*i.e.*, $.0125 * 4,142/52 = 1$).

(continued....)

benefits of circuit audits would outweigh the costs, under varying cost assumptions? How should we factor in the very substantial benefit not included in this calculation to numerous other people who are able to avoid pain, suffering, distress, and financial loss as a result of having more reliable access to 9-1-1 services? To assess whether the benefits that would accrue from full implementation of this recommendation would outweigh the incremental costs, we seek detailed and reliable data on the estimates identified above. Specifically, we invite providers to disclose the percentage of PSAPs that are served by multiple selective routers and the average distance between PSAPs and selective routers (which would presumably affect the cost of a physical audit). What is the mean cost of performing a physical circuit audit for each PSAP? Specifically, how many hours are required, and what is the cost per hour? In PSAPs where circuit audits are routinely performed, how many times per year are they done? What is the fraction of PSAPs for which no circuit audits are currently being done, and has the experience of the derecho affected that fraction? How will the transition from legacy 9-1-1 infrastructure to NG9-1-1 affect the routing of 9-1-1 calls and the need for physical diversity in networks that may also be reconfigured electronically? For example, though we presume NG9-1-1 architectures will be more resilient than current 9-1-1 architectures, we believe that network transport diversity will continue to be important in an NG9-1-1 environment and invite comment on that conclusion. How much of the cost is already incorporated into service providers' budgets and plans?

2. Sufficient Backup Power at Central Offices

44. We note that all of the central offices involved in 9-1-1 failures during the June 2012 derecho, like almost all central offices throughout the country, had some sort of backup power in place. We seek comment, however, on potential vulnerabilities in central office backup power throughout the Nation, including areas where dedicated backup power may not be as prevalent. Current backup power technologies include uninterruptible power supply (UPS) systems, backup batteries that may last several hours, and backup generators that can operate as long as fuel remains available. Multiple CSRIC best practices address backup power issues such as generator design and configuration,¹⁰¹ and appropriate testing and maintenance.¹⁰² The derecho, however, raised many questions regarding backup power, including whether all central offices must have some form of backup power, and what constitutes adequate backup power. Because so many 9-1-1 service providers ultimately suffered a loss of power, the

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Significantly, we believe this calculation likely understates the expected benefits of our proposed changes. One reason is that, whereas the estimate captures the lives lost when ambulances are delayed twenty minutes by less accurate location information, it fails to capture any of the lives lost when the ambulances never arrive at all due to the lack of access to 9-1-1. Another reason is that this study considered only cardiac emergency calls which, according to the study, accounted for less than 20 percent of medical emergency calls and less than 10 percent of total emergency calls. The estimated saving of one life therefore likely underestimates the expected benefits from 10 percent of the 9-1-1 calls and fully excludes the expected benefits from the remaining 90 percent of 9-1-1 calls that will be completed due to increased reliability of the 9-1-1 network.

¹⁰¹ See CSRIC Best Practice 8-7-5281, *supra* note 71 (disapproving of interdependent generators); CSRIC Best Practice 8-7-0657, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-0657> (“Network Operators, Service Providers and Property Managers should design standby generator systems for fully automatic operation and for ease of manual operation, when required.”); CSRIC Best Practice 8-7-5058, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-5058> (stating generally that all critical infrastructure facilities, including security equipment, should be supported by backup power systems such as batteries, generators, and fuel cells).

¹⁰² See CSRIC Best Practice 8-7-0662, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-0662> (“Network Operators, Service Providers and Property Managers should exercise power generators on a routine schedule in accordance with manufacturer’s specifications. For example, a monthly 1 hour engine run on load, and a 5 hour annual run.”).

Bureau recommended that the Commission take action to ensure that central offices have sufficient backup power, noting how important it is to maintain robust, resilient backup power in critical facilities, supported by appropriate testing, maintenance, and records retention.¹⁰³ The Bureau added that failure of central office backup power during a commercial power outage can disable a broad range of communications for a community, including emergency communications.¹⁰⁴ During the *derecho*, approximately 7 percent of one affected service provider's central-office generators failed to operate properly when needed.¹⁰⁵ To what extent is this failure rate representative of central-office backup power nationwide among all 9-1-1 service providers? What rate of generator or other backup power failures have service providers experienced during other recent power failures?

45. In light of these concerns, we seek comment on whether the Commission should institute requirements with respect to backup power, including testing and maintenance of backup power equipment. How closely do providers adhere to existing industry best practices and other published guidelines on backup power? Would new or expanded best practices provide additional guidance necessary to help maintain reliable backup power? If so, would additional best practices provide as much assurance of rigorous compliance as any of the approaches proposed here? What additional best practices are needed in this area? How closely do providers follow generator and battery manufacturers' recommended maintenance schedules? We also are interested in comment regarding backup power test records, *e.g.*, what types of records are actually maintained, and the general content of those records. How long are records retained, and are they shared effectively within the service provider's organization? As records could not always be readily located,¹⁰⁶ does this suggest that FCC monitoring would be helpful? If a battery or generator fails a routine test, is that information communicated to management and reliably acted upon in a timely manner?

46. If we conclude that the Commission should establish backup power requirements, what, more precisely, should be required? Acknowledging that what constitutes a "central office" can vary to some extent by service provider and location,¹⁰⁷ we ask commenters to give views on whether and how an adequate level of backup power may differ based on the type of facility. Should the required level of backup power depend on the relationship of each central office to reliable 9-1-1 service? Furthermore, the forecast transition to NG9-1-1 will likely allow some capabilities to be hosted outside of central offices in consolidated data centers. We seek comment on the level of backup power currently available at such facilities and the degree to which they should be required to comply with backup power standards for 9-1-1 networks.

47. Should the Commission require service providers to file reports describing their central office backup power schemes, including maintenance and testing? If so, how often should providers have to file such reports? Should reports be based on conformance with specific best practices, or other standards adopted by the Commission? How many reports would there be? We also ask what specific information should be included in these reports, *e.g.*, should the report be limited to factual discussion of existing practices, or should providers also report on any planned improvements? Should the report

¹⁰³ See *Derecho Report* at 16-20, 40.

¹⁰⁴ See *id.* at 40.

¹⁰⁵ See *id.* at 15-16.

¹⁰⁶ See *id.* at 20 (noting that one service provider could not locate maintenance logs for one of the backup generators that failed during the *derecho*).

¹⁰⁷ For example, we understand that the central office of a provider serving a large metropolitan area may differ from that of a provider serving a more rural area.

explicitly note departures from industry best practices? Should the reports include an inventory of backup power deployment in service provider central offices? Should providers report on the results of recent tests and their protocol for addressing needed repairs? Should the reports be made publicly available? Would a requirement help foster the sustained focus needed to make a difference?

48. We also seek comment on the approach of having 9-1-1 service providers periodically certify that their central offices have sufficient backup power or conform with specific best practices. With this approach, to what standard(s) should providers certify? What existing industry backup power standards or guidance might serve as a usable template? Beyond certifying that their backup power meets minimum standards, what other factors might service providers be required to certify to? How often should providers be required to file any such certifications, and how granular should they be? Who, by title, should attest to the validity of the certification?

49. We seek comment on whether we should adopt a minimum standard for central office backup power. Should the Commission require on-site backup power for a specific number of hours, whether through appropriately rated batteries or a backup generator with a sufficient fuel supply? Should we require that service providers maintain sufficient backup power to ensure continuity of critical communications and, if so, how should “critical communications” be defined? Should the Commission require service providers to have in place and implement plans for regular maintenance and testing of backup power equipment?¹⁰⁸ If so, should the Commission specify a level of detail and granularity for those plans? Would periodic site inspections or compliance reviews be useful to ensure compliance? Do service providers currently test backup generators under actual office load, and is that method preferable to or more effective than others?¹⁰⁹ How often do service providers employ tandem generator arrangements where the failure of one generator would result in a central office being switched immediately to battery backup? Should these generators be replaced or redesigned to shed nonessential loads? We seek comments on the benefits and drawbacks of each implementation approach, and compared to each other.

50. We also seek input regarding additional costs, if any, that would accrue to providers who are not already rigorously implementing best practices, and to all providers to either report or certify. The cost associated with reporting and certification appears to be a fraction of the cost required to remediate deficiencies that these approaches reveal. However, the very preliminary information obtained by the Bureau so far suggests that remediation may not be necessary for a substantial majority of central offices that already have permanent generators and readily accessible portable generators; do not use tandem generator arrangements, where the failure of one generator results in neither generator functioning; and already have implemented appropriate battery and generator testing. We seek more specific information about the prevalence of each of these situations below, and on the estimated time and cost associated with remediation where necessary. Is the range of potential remediation costs wide enough to raise questions about whether the costs of remediation may exceed the benefits?

51. We have identified a number of questions involving potential costs that appear relevant to this inquiry. How many central offices have a generator onsite? A portable generator that can be deployed promptly (*e.g.*, within four hours)? What is the fully loaded cost of such a portable generator?

¹⁰⁸ For example, as discussed in the *Derecho Report*, for some time before the *derecho*, Verizon had not been engaging in full-load generator testing procedures in Arlington. See *Derecho Report* at 17-18.

¹⁰⁹ Testing under actual site load means the office is switched off the commercial power grid onto generator power. Unlike testing with simulated load banks, this method verifies that the generator can power the office in an emergency.

How many central offices have batteries that are not tested to the manufacturer's specifications? How long does it take on average to test such batteries over the course of a year? What is the cost of doing so? Similarly, how many onsite generators are not tested monthly or yearly, and what would the associated incremental costs of such testing be? What is the likelihood of a generator's failing a monthly or annual maintenance test, and the associated cost of repairing it? How many tandem generator arrangements are there, in which the failure of one results in neither functioning? How much is already budgeted to address problems associated with the potential need to address these issues?

52. *Having generators available in all central offices.* The degree of sensitivity of our analysis to the accuracy of the data on the foregoing questions may be illustrated with an example. Assume that only 25 percent of the roughly 24,500 central offices in the United States (6,125 offices) do not have a generator onsite, and that of these only 5 percent do not have a dedicated portable generator that can be deployed within four hours (306 offices).¹¹⁰ The offices without permanent generators would likely be smaller facilities that offer a lighter electrical load than larger offices serving major metropolitan areas. If the fully loaded cost of such a portable generator were \$30,000, the total cost nationwide to provide generator backup power to central offices without it would be approximately \$9.2 million.¹¹¹ Is this a reasonable estimate? Does it take account of all relevant costs? Alternatively, if it costs \$100,000 to install permanent generators and fuel tanks at each central office that cannot be served by a portable unit – which we consider unlikely in smaller offices – the total cost nationwide would still not exceed \$30.6 million.¹¹² We seek comment on these cost assumptions and the analysis used to arrive at the final estimate.

53. *Battery testing.* We seek similar analyses of the costs associated with battery testing, and of the sensitivity of our analysis to variations in cost estimates. For example, if only 10 percent of the central offices (2,450 offices) have batteries that are not tested to the manufacturer's specifications,¹¹³ and it takes eight hours on average to test batteries in a central office over the course of a year, the total cost to test batteries at those 2,450 central offices would be \$1,568,000.¹¹⁴ Is this a reasonable estimate? Does it take account of all relevant costs? If either of those estimates were doubled, the cost would not exceed \$3.1 million. We seek comment on the methods and assumptions in this analysis.

54. *Generator testing.* If the monthly and more extensive yearly tests are not done in 5 percent of the offices with onsite generators (919 central offices)¹¹⁵ and it takes 30 minutes to run the monthly test and two hours to run the yearly test,¹¹⁶ additional yearly costs for the monthly tests would be

¹¹⁰ We assume that a central office can function reliably on battery power for four hours.

¹¹¹ 306 central offices * \$30,000 = \$9,180,000.

¹¹² 306 central offices * \$100,000 = \$30,600,000. We base this estimate on a Texas Public Utilities Commission report noting that it cost an average of \$107,000 to install a permanent emergency generator and fuel tanks at central offices. See Quanta Technology, COST-BENEFIT ANALYSIS OF THE DEPLOYMENT OF UTILITY INFRASTRUCTURE UPGRADES AND STORM HARDENING PROGRAMS, Final Report to Public Utility Commission of Texas, at 51-52, tbl. 5-2, available at http://www.puc.texas.gov/industry/electric/reports/infra/Utlity_Infrastructure_Upgrades_rpt.pdf (Texas PUC Report).

¹¹³ See generally Michael P. O'Brien, CENTRAL TELEPHONE OFFICE BATTERY PLANT ACCEPTANCE/CAPACITY TEST PROCEDURE, available at <http://www.battcon.com/PapersScanned1997/OBrienPaper1A1997.pdf>.

¹¹⁴ 2,450 central offices not currently testing batteries at least annually * 8 hours * \$80 per hour = \$1,568,000

¹¹⁵ 24,500 * .75 * .05 = 919

¹¹⁶ See CSRIC Best Practice 8-7-0662, *supra* note 102 (“Network Operators, Service Providers and Property Managers should exercise power generators on a routine schedule in accordance with manufacturer's specifications. For example, a monthly 1 hour engine run on load, and a 5 hour annual run.”).

only \$441,000,¹¹⁷ and additional annual test costs only \$147,000.¹¹⁸ Is this a reasonable estimate? Does it take account of all relevant costs? Here, analysis of cost and benefits would appear to be less sensitive to variations in cost. Even if the cost of generator testing is twice what we estimate, the total cost would remain under \$882,000 per year for monthly tests and \$294,000 for annual tests. We seek comment on the methods and assumptions in this analysis. For example, what is the actual frequency of such tests per year? How long does a test last, and what is the hourly cost?

55. *Generator repaired soon after it fails a test:* The same would appear to be true of the costs of generator repair. Assume, for example, that during a year, a generator fails a maintenance test at 20 percent of central offices. This would result in test failures at 3,675 central offices¹¹⁹ in a year. Further assume that the repair of a failed generator is not begun in the next maintenance window¹²⁰ (or sooner) only 5 percent of the time. It is difficult to calculate the cost of doing a repair more rapidly, as the repair will be done in any event. Therefore, we assume a low cost of \$320, meaning an additional cost of \$58,800 to commence a repair at the next maintenance window for those central offices at which a generator fails a test and repair does not begin by the next maintenance window.¹²¹ Is this a reasonable estimate? Does it take account of all relevant costs? Were the cost twice as much, all service providers combined would not incur more than \$118,000 in additional expenses. We seek comment on the methods and assumptions in this analysis.

56. *Eliminating the tandem generator arrangement where the failure of one generator results in neither generator functioning:* Based on our initial conversations with service providers, we estimate that there are at most 25 central offices where the failure of one generator results in neither generator functioning. We ask providers to disclose the percentage (and absolute number) of their central offices that are equipped with tandem generators that can power the entire office when operating together but cannot do so when one of them has failed. If it would cost about \$10,000 to fix each instance of this problem by setting up a load-shedding arrangement, the total estimated cost would be \$250,000.¹²² Is this a reasonable estimate? Does it take account of all relevant costs? Even if remediation of these conditions is much more complex and service providers decide to install new permanent generators and fuel tanks at \$100,000 each,¹²³ the total cost would not exceed \$2.5 million. We seek comment on what the actual cost is to fix each instance.

57. *Total estimated backup power costs:* The foregoing range of assumptions would lead to a total estimated cost ranging between \$11.7 million and \$37.5 million for providers to implement all of these backup power recommendations nationwide, a major portion of which may include one-time costs. Is this a reasonable estimate? Does it take account of all relevant costs? We believe costs in this range would be justified by the decreased mortality risk associated with a reliable 9-1-1 system. Based on estimates of the statistical value of a human life, the proposed improvements in central office backup

¹¹⁷ 919 central offices x .5 hours * \$80 per hour * 12 times per year = \$441,120

¹¹⁸ 919 central offices * 2 hours * \$80 per hour = \$147,040 per year

¹¹⁹ 24,500 * .75 * .20 = 3675

¹²⁰ A maintenance window is a scheduled period of time when repairs and other routine maintenance can be performed on the network, typically during times of low traffic to minimize disruption to customers. *See generally* Window, ATIS TELECOM GLOSSARY, <http://www.atis.org/glossary/definition.aspx?id=291>. For purposes of this Notice, we assume that there is at least one maintenance window for routine generator repairs in a 24-hour day. We seek comment on that assumption, and on any other factors that affect the timing of generator repairs.

¹²¹ 3675 * .05 * \$320 = \$58,800

¹²² 25 * \$10,000 = \$250,000

¹²³ *See* Texas PUC Report, *supra*, note 112.

power would be justified if between two and six lives could be saved through implementation.¹²⁴ We seek comment on this cost-benefit analysis, including comment on our estimates and methodology. What percentage of central offices has generator(s) that are tested under a full load on a routine schedule? What is the frequency of such tests per year and what is the cost of performing them? Specifically, how many tests are done, how long does a test last, and what is the hourly cost? What percentage of central-office generators fail a test on average each year, and what percentage of those inoperable generators receive repairs by the next maintenance window? What is the cost of those repairs on average?

58. To what extent would our cost estimate vary with the approach the Commission takes to address each issue? For example, would there be incremental costs associated with implementing the internal controls associated with a certification approach, or can it be assumed that covered entities have already implemented such controls to be in compliance with existing statutory requirements? If not, what incremental costs would be incurred? Likewise, would there be incremental costs associated with the reporting approach that are not specified in the analysis described above?

3. Robust Network Monitoring Capabilities

59. A 9-1-1 service provider typically operates one or more Network Operations Centers (NOCs) from which it performs, among other tasks, remote monitoring of its network. This monitoring enables a provider to detect critical facilities outages and other problems as soon as they occur and to deploy resources as appropriate to rectify problems. These NOCs typically communicate with the network elements that they monitor by first connecting with one or more regional aggregation points, which then connect to the array of network elements to be monitored. The diversity of these regional aggregation points, including the diversity of the facilities that connect them to NOCs, is vital to communications reliability. During the derecho, the network monitoring capabilities of the two primary ILECs involved were disabled within the area of the storm, depriving them of visibility into the status of their network operations and complicating their recovery efforts.¹²⁵ In both instances, the loss of monitoring capability throughout the segment of the network affected by the storm could be attributed to a single point of failure. To what extent do these failures reflect vulnerabilities in network monitoring systems nationwide? How often do other 9-1-1 service providers rely on a single physical path to monitor large portions of their networks, and why have redundant links not been installed?

60. Based on network monitoring failures during the derecho, the Bureau recommended that the Commission take action to ensure that 9-1-1 service providers put in place “diverse monitor and control links and capabilities throughout their network[s].”¹²⁶ We seek comment on whether and how to implement this recommendation. What have 9-1-1 service providers affected by the derecho done to ensure they will not lose visibility into their networks during future emergencies? To what extent have other 9-1-1 service providers implemented diverse monitoring capabilities within their networks, and do they plan specific, additional improvements in response to the derecho? How can the Commission be confident that these measures will be sustained?

61. Should the Commission pursue the *Derecho Report*'s recommendations with respect to

¹²⁴ See DOT Statistical Life Valuation, *supra* note 97, Cardiac Study, *supra* note 100. Beyond the saving lives, other more unquantifiable health benefits will accrue for many people.

¹²⁵ See *Derecho Report* at 18, 21. Both companies relied on out-of-state data centers to monitor facilities through these links as part of their reliability planning, meaning that loss of monitoring links cut off all visibility into the network in affected areas.

¹²⁶ *Id.* at 40.

network monitoring, how should it specify the level or degree of “diversity” expected of network monitoring and control capabilities? For example, should the Commission define this “diversity” such that the failure of one element of a service provider’s monitoring system, for example the failure of a control link, cannot result in the loss of network monitoring capabilities? If this definition is not suitable, what would a suitable alternative be and why is it superior? We observe that, unlike other policy objectives the Bureau recommends, diversity in network monitoring is not the subject of a specific CSRIC best practice, although other best practices address circuit diversity and network monitoring in general.¹²⁷ Are new or more specific best practices needed to provide guidance in this area? If so, what new or revised best practices are needed? Would additional best practices provide as much assurance of rigorous compliance as any of the approaches proposed here? Who should be charged with developing these best practices? At a minimum, the *derecho* revealed that it is a sound engineering practice to design network monitoring centers with visibility into the network through physically diverse links that help to avoid single points of failure.¹²⁸ Where are these concepts addressed in industry best practices or other published guidelines? How will the transition to NG9-1-1 affect network monitoring technologies and the need for diverse monitoring links?

62. Should the Commission require service providers to file reports describing the diversity of their network monitoring capabilities? If so, how often should such reports be filed, and how granular should they be? What specific information should be included in these reports? For example, should the reports include detailed descriptions of service provider monitoring and control architectures, including maps? What are the public safety and homeland security implications of public disclosure of key network routes? Should such reporting be limited to factual discussion of existing practices, or should providers also report on any planned or ongoing efforts to improve the diversity of their network monitoring capabilities?

63. We also seek comment on the approach of having providers certify that their monitoring and control links are sufficiently diverse. With this approach, to what diversity standard should providers certify? For example, should service providers certify that no single points of failure exist in the network monitoring facilities that run between their NOCs and regional aggregation points? Beyond certifying that their monitoring links are sufficiently diverse, what other information should providers be required to certify? For example, should service providers be asked to certify that they have more than one regional aggregation point in major metropolitan areas? How often should providers be required to file any such certifications, and how granular should they be? How could existing certification schemes, such as Section 302 of SOX, serve as models for such certification?

64. Should the Commission require service providers to implement a certain level of diversity in their network monitoring and control capabilities? If so, how precisely should the Commission specify the level or degree of “diversity” required of network monitoring and control links? Should the Commission avail itself of compliance reviews or formal inspections as a further means of ensuring compliance with any such rule it adopts?

65. The Bureau explains in its report that “the benefits of this recommendation will likely outweigh the costs due to the relatively small set of links involved” and the potentially significant benefits

¹²⁷ See CSRIC Best Practice 8-7-0532, *supra* note 46 (addressing network diversity); CSRIC Best Practice 8-7-0401, available at <https://www.fcc.gov/nors/outage/bestpractice/DetailedBestPractice.cfm?number=8-7-0401> (“Network Operators and Service Providers should monitor their network to enable quick response to network issues.”)

¹²⁸ See *Derecho Report* at 18, 34.

to be derived from eliminating single points of failure in 9-1-1 network monitoring.¹²⁹ We tentatively find this analysis persuasive. We note that as early as August 2012, Verizon in particular indicated that one of its planned post-derecho corrective actions was to “[r]edesign the telemetry network . . . to include more diverse connections and failover (alternative) locations.”¹³⁰ Since then, in January 2013, Verizon has provided additional details of its plan, noting that at the various end offices it would “[r]edesign telemetry edge routers” and “move all telemetry traffic to the IP network across the entire Verizon Telecom footprint.”¹³¹ With this approach, although visibility of an end office to a NOC would still be affected by power or other outages at the end office or NOC, the move to IP networks could eliminate potential intermediate single points of failure like that which existed in the Arlington office, and result in the level of reliability and robustness recommended in the *Derecho Report*. Because Verizon is doing this, can we reasonably infer that it would not be cost-prohibitive for other providers?

66. Preliminary conversations with stakeholders indicate that approximately 75 percent of the 366 major metropolitan areas in the United States lack redundant monitoring access through physically diverse links.¹³² If this assumption is accurate, and if we further assume that it would take 100 hours, at \$80 per hour, to install a redundant monitoring access point for those networks that lack this redundancy, we estimate that it would cost slightly less than \$2.2 million (*i.e.*, $0.75 \times 366 \times \$80 \times 100 = \2.2 million) to implement nationwide the Bureau’s recommendation where it is currently lacking. How accurate are these estimates, do they take into account all relevant costs, and how sensitive is our analysis to variations in them? For example, even if it costs twice as much to implement diverse monitoring links in each metropolitan area that currently lack them, the total cost to service providers would not exceed \$4.4 million. In either case, given the crucial role that network monitoring plays in troubleshooting network problems that speed recovery efforts during major emergencies, the overall benefits in decreased risk of mortality would appear likely to outweigh the costs of implementing this recommendation.¹³³ We seek comment on this cost benefit analysis. Specifically, we invite providers to disclose the percentage (and absolute number) of metropolitan areas within their service area in which they have implemented only a single monitoring access point. What is the cost of setting up an IP-based or other alternative that eliminates all single points of failure in the telemetry and control paths for those circuits that are used to deliver 9-1-1 calls to PSAPs? Can the work described be performed by existing staff members, or would it require the hiring of additional personnel? Specifically, what are the equipment costs, the number of hours required, and the average cost per hour?

E. Improved PSAP Notification Under Section 4.9 of the Commission’s Rules

67. The derecho also demonstrated that timely, clear, and appropriately targeted communication between 9-1-1 service providers and PSAPs is key during any disruption of 9-1-1 service,

¹²⁹ *Derecho Report* at 40-41.

¹³⁰ See VERIZON, 911 SERVICE AND THE JUNE 29, 2012, DERECHO 6 (Aug. 13, 2012) (submitted with Verizon Comments).

¹³¹ See Verizon Presentation to MWCOG, *supra* note 91, slide 4.

¹³² The U.S. Office of Management and Budget identifies 366 metropolitan statistical areas (MSAs) in the United States. See OMB BULLETIN NO. 10-02, UPDATE OF STATISTICAL AREA DEFINITIONS AND GUIDANCE ON THEIR USES 2 (2009), available at <http://www.whitehouse.gov/sites/default/files/omb/assets/bulletins/b10-02.pdf>. Our conversations with stakeholders suggest that service providers in a majority of these areas currently have only a single, non-diverse pathway for network monitoring, including key links between their regional aggregation points and NOCs.

¹³³ See DOT Statistical Life Valuation, *supra* note 97, Cardiac Study, *supra* note 100.

particularly in a disaster when the public requires additional emergency assistance. The Commission's current rules recognize that PSAPs must be notified when communications outages affect 9-1-1 service, but the *derecho* revealed that many PSAPs' efforts to restore service and respond to emergencies during the *derecho* were hindered by inadequate information and otherwise ineffective communication by service providers. Although we recognize that conditions often change rapidly in disaster situations, PSAPs – and ultimately the public – depend on communications providers for accurate situational awareness when outages affect public safety. We therefore propose amendments to section 4.9 of the Commission's rules to clarify how service providers can more effectively and uniformly notify PSAPs of outages affecting 9-1-1 service and cooperate to restore service as quickly as possible.

68. Section 4.9 requires certain communications providers to notify the Commission within 120 minutes of discovering a reportable outage.¹³⁴ The rule also requires specified providers to notify “9-1-1 special facilities” – *i.e.*, PSAPs – affected by an outage with “all available information that may be useful” to mitigate the outage “as soon as possible by telephone or other electronic means.”¹³⁵ After the *derecho*, however, many PSAPs reported that they were not notified of outages or received inadequate information about the scope of impacts to 9-1-1 service. The lack of specificity in this rule has led to questions regarding how to determine whether or how providers are complying with the Commission's PSAP notification requirements. Accordingly, the *Derecho Report* recommended that “[t]he Commission should consider stating what is expected of providers with more specificity, including, for example, methods of notification and a minimum level of detail in the information provided to PSAPs.”¹³⁶ The report also observed that “[s]uch clarification may improve compliance and result in greater situational awareness for PSAPs.”¹³⁷

69. During the Bureau's *derecho* inquiry, multiple PSAPs stated that they contacted their 9-1-1 service provider to report a loss of service before being contacted by the provider.¹³⁸ Other PSAPs received notification in the form of “cryptic” e-mails that referenced problems in one central office but did not specify all of the jurisdictions affected.¹³⁹ Unsatisfied with this “passive and ineffective method of communication,”¹⁴⁰ some PSAPs have requested more comprehensive notification through multiple communications platforms, including the possibility of having a company representative with decision-making authority physically present at each jurisdiction's operations center during large-scale emergencies.¹⁴¹ Furthermore, inadequate information from service providers during the *derecho* led some PSAPs to activate ineffective reroutes, or to attempt to reroute even though service could have been

¹³⁴ See 47 C.F.R. § 4.9.

¹³⁵ See 47 C.F.R. § 4.9(a)(4) (cable providers); 47 C.F.R. § 4.9(c)(2)(iv) (satellite providers); 47 C.F.R. § 4.9(e)(5) (wireless providers); 47 C.F.R. § 4.9(f)(4) (wireline providers) 47 C.F.R. § 4.9(g)(i) (interconnected VoIP providers).

¹³⁶ *Derecho Report* at 41.

¹³⁷ *Id.*

¹³⁸ See *id.* at 30-31, 34.

¹³⁹ See Fairfax County Comments at 7; Reply Comments of Loudoun County, Virginia, PS Docket No. 11-60, at 1 (Aug. 28, 2012).

¹⁴⁰ Fairfax County Comments at 17.

¹⁴¹ See *Derecho Report* at 22.

restored via the original route.¹⁴²

70. We therefore propose revisions to section 4.9 attached to this *Notice* as Appendix B. By this language, we intend to clarify 9-1-1 service providers' outage reporting obligations and better ensure that PSAPs receive timely and actionable notification when a communications outage affects 9-1-1 service. Under the proposed rules, service providers subject to PSAP notification requirements would be required to notify PSAPs of outages immediately, by telephone and in writing via electronic means. These notifications would include, at a minimum, the nature of the outage, the estimated number of users affected or potentially affected, the location of those users, the actions being taken by provider to address the outage, the estimated time at which service will be restored, recommended actions the impacted facility should take to minimize disruption of service,¹⁴³ and the sender's name, telephone number and email address at which the sender can be reached.

71. We seek comment on this proposed language and any alternative revisions to section 4.9 that would accomplish the goal of clarifying reporting obligations and ensuring that PSAPs receive more detailed outage notifications. To what extent do providers currently inform PSAPs of 9-1-1 outages, and what is included in those communications? What additional information would PSAPs find useful? How much information that would be helpful to PSAPs is practically available to service providers during natural disasters and other emergencies? Under the proposed rule, service providers would be required to provide PSAP notification immediately. Should the Commission adopt a more specific timeframe by when service providers must notify PSAPs? If so, what would be an appropriate timeframe? Should the Commission specify a list of acceptable "electronic means" for written notifications, or do PSAPs and service providers prefer flexibility to choose their own methods of communication? Should service providers be required to keep and retain records of their communications with PSAPs to demonstrate compliance with notification requirements? To what extent do state tariffs and other state and local regulations impose requirements regarding outage reporting and communication in general between service providers and PSAPs?

72. We note that the current outage reporting rules apply to a range of service providers beyond the ILECs that typically route 9-1-1 calls to PSAPs under current network configurations.¹⁴⁴ Should any new or revised PSAP notification requirements apply to all entities covered by section 4.9, or only those considered "9-1-1 service providers" for purposes of this *Notice*? Should amended notification requirements apply to additional service providers who are not already covered by section 4.9? Because our intent is to clarify the current rule and promote efficient communication between service providers and PSAPs, we begin with the assumption that revisions would be most effective if applied consistently to all providers covered by the current rule. We invite comment on that view, however, and seek input on the range of entities that should be subject to revised PSAP notification requirements.

73. In light of the anticipated evolution toward NG9-1-1, we also seek comment on whether entities such as data centers and centralized call centers that do not fit the traditional definition of PSAPs should also be notified of communications outages. For example, how would the outage-reporting rules

¹⁴² See Verizon Comments at 6, n.15 ("[C]ertain of these PSAPs would have been better off [not rerouting calls], but without the appropriate information, they were unable to make that determination at the time").

¹⁴³ For example, the 9-1-1 service provider could provide the PSAP with recommended reroutes based on the status of other parts of its network.

¹⁴⁴ See 47 C.F.R. § 4.9(a)(4) (cable providers); 47 C.F.R. § 4.9(c)(2)(iv) (satellite providers); 47 C.F.R. § 4.9(e)(5) (wireless providers); 47 C.F.R. § 4.9(f)(4) (wireline providers) 47 C.F.R. § 4.9(g)(i) (interconnected VoIP providers).

apply to consolidated call centers that may not be physically located in the affected area but still serve many of the functions of a traditional local PSAP? As technologies evolve, is there a better way to approach PSAP notification than the current rubric of direct communication from service provider staff to PSAP staff? For example, are there automated technologies such as machine-readable data feeds that could transmit outage information to PSAPs in a standardized format?

74. Because service providers must already notify PSAPs of outages under current rules, we do not expect any incremental costs resulting from a clarification of that obligation. We do, however, seek comment on the costs and benefits of particular notification requirements, as well as the burden each approach would place on providers and PSAPs.

IV. OTHER MATTERS

A. Legal Authority

75. In the *Reliability NOI*, we sought comment on the potential sources of legal authority for Commission action to promote the reliability and continuity of 9-1-1 communications networks. We now seek comment specifically on the sources of legal authority that could support the adoption of proposals put forward for consideration in this *Notice* or similar proposals. In doing so, we observe that the subject matter of this *Notice* is more limited in scope than the broad inquiry undertaken in the *Reliability NOI*. We are seeking comment in this *Notice* specifically on proposals to promote the reliability and resiliency of communications infrastructure that is essential for 9-1-1 service.

76. Congress created the Commission, among other reasons, to “promot[e] the safety of life and property through the use of wire and radio communications,”¹⁴⁵ and there has been judicial recognition of the “[t]he broad public safety and 9-1-1 authority Congress has granted the FCC.”¹⁴⁶ For example, we are given the goal of “obtaining maximum effectiveness from the use of radio and wire communications in connection with safety of life and property” and charged with “investigat[ing] and study[ing] all phases of the problem and the best methods of obtaining the cooperation and coordination of these systems.”¹⁴⁷ In the Wireless Communications and Public Safety Act of 1999, Congress required the Commission to “designate 9-1-1 as the universal emergency telephone number for reporting an emergency to appropriate authorities and requesting assistance.”¹⁴⁸ The NET 911 Improvement Act of 2008 made explicit the Commission’s authority to regulate the provision of 9-1-1 by VoIP service providers, “in accordance with . . . such requirements [a]s may be modified by the Commission from time to time.”¹⁴⁹ More recently, Congress has charged the Commission with ensuring “reliable emergency access” for individuals with disabilities, granting it authority to issue regulations “as are necessary to achieve reliable, interoperable communication that ensures access” by such individuals to an IP-enabled “emergency network, where achievable and technically feasible.”¹⁵⁰ When tied together with section 201(b), which gives the Commission authority to “prescribe such rules and regulations as may be

¹⁴⁵ 47 U.S.C. § 151.

¹⁴⁶ *Nuvio Corp. v. FCC*, 473 F.3d 302, 311 (D.C. Cir. 2007) (Kavanaugh, J., concurring).

¹⁴⁷ 47 U.S.C. § 154(o).

¹⁴⁸ 47 U.S.C. § 251(e)(3).

¹⁴⁹ 47 U.S.C. § 615a-1(a).

¹⁵⁰ Twenty-First Century Communications and Video Accessibility Act of 2010, Pub. L. No. 111-260, 124 Stat. 2751 (codified at 47 U.S.C. § 615c(g)).

necessary in the public interest to carry out the provisions” of the Act,¹⁵¹ section 303(r), which requires the Commission to “[m]ake such rules and regulations and prescribe such restrictions and conditions, not inconsistent with law, as may be necessary to carry out the provisions of this chapter,”¹⁵² and section 154(i), which authorizes us to “perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of [the Commission’s] functions,”¹⁵³ we believe that these provisions empower the Commission to implement the proposals contained herein or similar proposals. We seek comment on this analysis.

77. We also seek comment on whether other statutory provisions provide a legal basis for the adoption of such proposals. To the extent that 9-1-1 service providers are common carriers, would section 201(b)’s requirement that the “practices” of common carriers be “just and reasonable” serve as independent authority for these proposals?¹⁵⁴ Would this provision extend to any practices determined unreasonably to deprive the public of the availability of 9-1-1 services vital to “promoting the safety of life and property” during major disasters? Similarly, section 214(d)’s requirement that a common carrier “provide itself with adequate facilities for the expeditious and efficient performance of its service as a common carrier”¹⁵⁵ includes an obligation to “undertake improvements in facilities” to meet public demand.¹⁵⁶ Would that obligation cover the duty to provide diversity in circuits, adequacy of power supplies, or other such “facilities” deemed necessary to satisfy expectations that carriers will comply with industry best practices, or other standards determined to be appropriate to ensure reasonable availability of such critical emergency services? With respect to our reporting and certification proposals, we seek comment on our authority to obtain from common carriers “full and complete information necessary to enable the Commission to perform the duties and carry out the objects for which it was created.”¹⁵⁷ Finally, to the extent that 9-1-1 service providers use spectrum to provide that service, would our broad authority to “[p]rescribe the nature of the service to be rendered,”¹⁵⁸ and more generally “to manage spectrum . . . in the public interest,” also afford adequate authority for such proposals to ensure quality of 9-1-1 service?¹⁵⁹ We seek comment on these views.

¹⁵¹ 47 U.S.C. § 201(b).

¹⁵² 47 U.S.C. § 303(r).

¹⁵³ 47 U.S.C. § 154(i).

¹⁵⁴ 47 U.S.C. § 201(b).

¹⁵⁵ 47 U.S.C. § 214(d).

¹⁵⁶ RCA Communications, Inc., *Memorandum Opinion and Order*, 44 F.C.C.2d 613 ¶ 17 (1956). Although section 214(d) requires a “full opportunity for hearing,” that requirement may be satisfied by notice and comment rulemaking. *See, e.g.*, Amendment of Parts 65 and 69, 10 FCC Rcd 6788 ¶¶ 56-57 (1995), *citing AT&T v. FCC*, 572 F.2d 17 (2d Cir. 1978) (identical language in section 205(a)). *See generally United States v. Storer Broadcasting Co.*, 351 U.S. 192 (1956); *WBEN, Inc. v. United States*, 396 F.2d 601, 617-18 (2d Cir. 1968); *California Citizens Band Ass’n v. United States*, 375 F.2d 43 (9th Cir. 1967) (interpreting other hearing requirements set forth in the Act).

¹⁵⁷ 47 U.S.C. § 218. *See, e.g.*, 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, *Report and Order*, 27 FCC Rcd 2650, 2675-76 ¶ 61 (2012).

¹⁵⁸ 47 U.S.C. § 303(b).

¹⁵⁹ *Celco Partnership v. FCC*, 700 F.3d 534, 541-42 (D.C. Cir. 2012) (citing 47 U.S.C. § 303(b)). As the court made clear, Title III endows the Commission with “expansive powers” and a “comprehensive mandate to ‘encourage the larger and more effective use of radio in the public interest.’” *Id.*, quoting *NBC v. United States*, 319 (continued....)

78. In light of the Commission’s foregoing express statutory responsibilities, would we have authority to impose requirements of the sort considered in this *Notice* on other 9-1-1 service providers? As we have found, “[t]he relationship between network reliability and reliable 9-1-1 service is clear; without reliable network operations, there can be no reliable 9-1-1 service.”¹⁶⁰ Would regulation be “reasonably ancillary” to the Commission’s foregoing statutory authority over 9-1-1 service?¹⁶¹ For example, would it provide a common baseline for the reliability of 9-1-1 service on a nationwide basis, regardless of the regulatory status of the entity providing the service?

B. Small Entities

79. The Regulatory Flexibility Act of 1980, as amended (RFA),¹⁶² directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.¹⁶³ Accordingly, we seek comment on the degree to which the rules proposed in this *Notice* would affect small businesses. Is it particularly costly or difficult for small entities to comply with any of the best practices and other requirements discussed above? Should there be exemptions for 9-1-1 service providers based on their size or the number of subscribers or PSAPs they serve? What effect would exemptions from 9-1-1 reliability and resiliency requirements have on public safety? In addition, pursuant to the Small Business Paperwork Relief Act of 2002,¹⁶⁴ we seek specific comment on how we might “further reduce the information collection burden for small business concerns with fewer than 25 employees.”¹⁶⁵ We discuss these matters in more detail in the Initial Regulatory Flexibility Analysis appended hereto.¹⁶⁶

C. Circumstances Beyond Providers’ Control

80. We also recognize that, at least in some cases, circumstances beyond the control of 9-1-1 service providers may affect their ability to comply with any recommendations we may adopt here. For example, environmental and zoning restrictions may prevent service providers from deploying or testing backup generators at certain locations, and redundant circuits may be particularly costly to install in other areas. We therefore seek comment on the extent to which these types of circumstances should be taken into account as part of any Commission action in this area. What are the specific laws, regulations, and

(Continued from previous page) _____

U.S. 190 (1943) (quoting 47 U.S.C. § 303(g)). For a recent description of the various sources of authority under Title III, see *In the Matter of Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications*, *Further Notice of Proposed Rulemaking*, PS Docket No. 11-153, FCC 12-149 at ¶¶ 168-70, 172. (Dec. 13, 2012).

¹⁶⁰ 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, *Report and Order*, 27 FCC Rcd 2650, 2678 ¶ 67 (2012).

¹⁶¹ See *United States v. Sw. Cable Co.*, 392 U.S. 157, 178 (1968) (recognizing that the Commission may exercise authority that is “reasonably ancillary to the effective performance of [its] various responsibilities”); *Comcast Corp. v. FCC*, 600 F.3d 642, 646 (D.C. Cir. 2010) (discussing ancillary authority).

¹⁶² See 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601-12, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, tit. II, 110 Stat. 857.

¹⁶³ 5 U.S.C. § 603(b)(3).

¹⁶⁴ Small Business Paperwork Relief Act of 2002, Pub. L. No. 107-198, 116 Stat. 729.

¹⁶⁵ See 44 U.S.C. § 3506(c)(4).

¹⁶⁶ See *infra*, Appendix A.

other challenges that would interfere with compliance with these requirements, and how prevalent are these challenges in specific localities? If cost should be considered, what are the appropriate criteria for deciding when a cost is truly prohibitive rather than merely inconvenient? Is the Commission's authority to suspend, revoke, amend, or waive its rules for good cause¹⁶⁷ sufficient to ensure consideration of these factors, or should there be explicit exemptions in the rules themselves? If we determine that a particular state, local, or tribal law, regulation, or practice affirmatively impedes the deployment of effective 9-1-1 services to PSAPs or the deployment of NG9-1-1 services, would the Commission have authority to preempt that law, regulation, or practice? If so, under what circumstances should we exercise that authority?

D. Review and Sunset

81. We also seek comment on whether the Commission should conduct a periodic review of any rules or other requirements that it adopts to ensure that those actions provide flexibility and take into account the continuing advancement of technology. If so, how often should such reviews occur, and how should the ongoing utility of each proposal be measured? Alternatively, we seek comment on whether the Commission should establish a sunset date on which any of the proposals would cease to apply. How should that date be determined, and should it be tied to a specific triggering event, *e.g.*, demonstrated improvements in network reliability or the widespread adoption of NG9-1-1? Should any of these proposals sunset for individual service providers once they deploy NG9-1-1? Because certain approaches may entail upfront costs that decrease over time, what effect should the cost of compliance have on a potential sunset date? Should sunset occur automatically without additional Commission action, or should the Commission consider a possible sunset after further review? How else might the Commission ensure that any action it takes remains current and technologically appropriate over time?

E. Procedural Matters

1. Regulatory Flexibility Act

82. As required by the Regulatory Flexibility Act of 1980 (RFA),¹⁶⁸ the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) for this Notice, of the possible significant economic impact on small entities of the proposals addressed in this document. The IRFA is set forth as Appendix A. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the Notice provided on or before the dates indicated on the first page of this Notice. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this Notice of Proposed Rulemaking, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).¹⁶⁹ In addition, the *NPRM* and IRFA (or summaries thereof) will be published in the Federal Register.¹⁷⁰

¹⁶⁷ See 47 C.F.R. § 1.3.

¹⁶⁸ See 5 U.S.C. § 603.

¹⁶⁹ See 5 U.S.C. § 603(a).

¹⁷⁰ See *id.*

2. Paperwork Reduction Act of 1995

83. This document contains proposed new information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

3. *Ex Parte* Rules

84. The proceeding of which this Notice is a part is a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.¹⁷¹ 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 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.

4. Comment Filing Procedures

85. Pursuant to sections 1.415 and 1.419 of the Commission’s rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments should be filed in PS Docket No. 13-75. 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.

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-

¹⁷¹ 47 C.F.R. §§ 1.1200, 1.1202 *et seq.*

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.

1. 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.
2. 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.
3. 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 & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

Confidential Materials: 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. 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. Section 0.459. Redacted versions of confidential submissions may be filed via ECFS.

V. ORDERING CLAUSES

86. Accordingly, IT IS ORDERED pursuant to sections 1, 4(i), 4(j), 4(o), 201(b), 214(d), 218, 251(e)(3), 301, 303(b), 303(g), 303(r), 307, 309(a), 309(j), 316, 332, 403, 615a-1, and 615c of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i)-(j) & (o), 201(b), 214(d), 218, 251(e)(3), 301, 303(b), 303(g), 303(r), 307, 309(a), 309(j), 316, 332, 403, 615a-1, and 615c, that this *Notice of Proposed Rulemaking* in PS Docket No. 13-75 and PS Docket No. 11-60 IS ADOPTED.

87. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Notice of Proposed Rulemaking*, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Initial Regulatory Flexibility Analysis

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹⁷² the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the recommendations in this *Notice of Proposed Rule Making (NPRM)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments provided in “Comment Period and Procedures” of this *NPRM*. The Commission will send a copy of this *NPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).¹⁷³ In addition, the *NPRM* and IRFA (or summaries thereof) will be published in the Federal Register.¹⁷⁴

A. Need for, and Objectives of, the Proposed Rules

2. The June 2012 derecho storm revealed serious vulnerabilities in the Nation’s 9-1-1 communications infrastructure that could have been prevented or mitigated through the implementation of best practices developed by industry and advisory bodies. Yet, the Bureau’s inquiry into communications failures during and after the storm found that multiple 9-1-1 service providers failed to implement best practices related to physical circuit diversity, central office backup power, and network monitoring, leading to emergency communications outages affecting millions of Americans.¹⁷⁵ In some cases, PSAPs did not receive timely or adequate notification of these outages, compounding the difficulty of providing emergency assistance until service was restored.¹⁷⁶ A broad range of comments from state and local governments, as well as public safety entities themselves, support the Bureau’s finding that such failures are unacceptable.¹⁷⁷ As part of its statutory obligation to ensure that communications networks of all types “promot[e] safety of life and property,”¹⁷⁸ the Commission has a particular responsibility to promote reliable emergency communications and prevent avoidable failures.

3. With the objective of ensuring reliability and resiliency of 9-1-1 networks and services, the *NPRM* proposes to:

- Ensure that 9-1-1 service providers conduct routine circuit audits to verify physical diversity and identify avoidable single points of failure. The *NPRM* seeks comment of the details of this obligation and the extent to which providers would be required to fortify non-diverse circuits.

¹⁷² See 5 U.S.C. § 603. The RFA, 5 U.S.C. § 601-12., has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121. tit. II, 110 Stat. 857.

¹⁷³ See 5 U.S.C. § 603(a).

¹⁷⁴ See *id.*

¹⁷⁵ See *Derecho Report* at 39-41.

¹⁷⁶ See *id.* at 29, 41.

¹⁷⁷ See Fairfax County Comments at 29; Virginia SCC Report at 8; MWCOG Report at 15-17.

¹⁷⁸ See 47 U.S.C. §§ 151, 154(o).

- Ensure that 9-1-1 service providers maintain adequate backup power in central offices, supported by appropriate testing, maintenance, and records retention. The *NPRM* seeks comment on what level of backup power should be considered adequate and whether current maintenance and recordkeeping practices are sufficient to ensure reliability.
- Ensure that 9-1-1 service providers maintain robust and resilient network monitoring capabilities, supported by diverse network monitoring and control links. The *NPRM* seeks comment on the degree of diversity and specific engineering practices necessary to protect network monitoring capabilities against single points of failure.

4. The *NPRM* proposes a range of approaches by which the above objectives could be accomplished. For instance, 9-1-1 service providers could be required to report whether they have implemented relevant best practices, or a company representative could be required to certify compliance with best practices on a regular basis. The Commission could also codify key best practices in its rules, such as a minimum level of physical diversity for 9-1-1 circuits. Under the latter approach, the Commission could also ensure compliance through periodic site inspections and compliance reviews. As the *NPRM* notes, these alternatives need not be mutually exclusive and are intended as a starting point for discussion of which approach(es) will yield the greatest benefit in communications reliability at the lowest cost to service providers.

5. The *NPRM* also proposes revisions to Section 4.9 of the Commission's rules to state with greater specificity how and when 9-1-1 service providers must notify PSAPs affected by communications outages. As noted in the *Derecho Report*, the current rule has led to questions regarding whether providers are complying fully with the Commission's PSAP notification requirements, and whether the current requirements provide PSAPs with actionable information.¹⁷⁹ Clarification of these standards could increase compliance by service providers and improve situational awareness for PSAPs affected by outages. Proposed text of the modified rule is attached as Appendix B.

6. The Commission traditionally has addressed communications reliability issues by working with service providers to develop voluntary best practices that address vulnerabilities in the communications network, and by measuring the effectiveness of those best practices through outage reporting. Under the Commission's current rules, the outage reporting process has often been effective in improving the reliability, resiliency, and security of many communications services. The June 2012 *derecho*, however, revealed the need to supplement this approach with regard to critical 9-1-1 communications. While the *NPRM* supports the development of additional best practices, it recognizes that additional Commission action may be appropriate. Thus, the proposed approach would complement, rather than replace, the existing regime of best practices and outage reporting.

B. Legal Basis

7. The legal basis for the rules and rule changes proposed in this *NPRM* are contained in Sections 1, 4(i), 4(j), 4(o), 201(b), 214(d), 218, 251(e)(3), 301, 303(b), 303(g), 303(r), 307, 309(a), 309(j), 316, 332, 403, 615a-1, and 615c of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 154(o), 201(b), 214(d), 218, 251(e)(3), 301, 303(b), 303(g), 303(r), 307, 309(a), 309(j), 316, 332, 403, 615a-1, and 615c. The Commission also believes it has ancillary authority under Title I of the Communications Act to impose the requirements discussed in the *NPRM* on any 9-1-1 service providers

¹⁷⁹ See *Derecho Report* at 29, 41.

not subject to express regulatory authority under Title II.¹⁸⁰ Any such regulations would be “reasonably ancillary” to the goal of ensuring a common baseline for the reliability of 9-1-1 service on a nationwide basis, regardless of the regulatory status of the entity providing the service.¹⁸¹

C. Description and Estimate of the Number of Small Entities to Which Rules Will Apply

8. The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the proposed rules adopted herein.¹⁸² The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”¹⁸³ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.¹⁸⁴ A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).¹⁸⁵

1. Total Small Entities

9. Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.¹⁸⁶ First, nationwide, there are a total of approximately 27.9 million small businesses, according to the SBA.¹⁸⁷ In addition, a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹⁸⁸ Nationwide, as of 2007, there were approximately 1,621,315 small organizations.¹⁸⁹ Finally, the term “small governmental jurisdiction” is defined generally as “governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹⁹⁰ Census Bureau data for 2011 indicate that there were 89,476

¹⁸⁰ See, e.g., 47 U.S.C. § 154(i) (“The Commission may perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this Act, as may be necessary in the execution of its functions”).

¹⁸¹ See *United States v. Sw. Cable Co.*, 392 U.S. 157, 178 (1968) (recognizing that the Commission may exercise authority that is “reasonably ancillary to the effective performance of [its] various responsibilities”); *Comcast Corp. v. FCC*, 600 F.3d 642, 646 (D.C. Cir. 2010) (discussing ancillary authority).

¹⁸² 5 U.S.C. § 603(b)(3).

¹⁸³ 5 U.S.C. § 601(6).

¹⁸⁴ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

¹⁸⁵ Small Business Act, 15 U.S.C. § 632.

¹⁸⁶ See 5 U.S.C. §§ 601(3)–(6).

¹⁸⁷ See *Frequently Asked Questions*, U.S. SMALL BUS. ADMIN. OFFICE OF ADVOCACY, http://www.sba.gov/sites/default/files/FAQ_Sept_2012.pdf (reporting numbers from 2010).

¹⁸⁸ 5 U.S.C. § 601(4).

¹⁸⁹ INDEP. SECTOR, *THE NEW NONPROFIT ALMANAC AND DESK REFERENCE* (2010).

¹⁹⁰ 5 U.S.C. § 601(5).

local governmental jurisdictions in the United States.¹⁹¹ We estimate that, of this total, as many as 88,506 entities may qualify as “small governmental jurisdictions.”¹⁹² Thus, we estimate that most governmental jurisdictions are small.

2. Entities Subject to *NPRM*

10. As noted in the *NPRM*, we seek comment on the class of entities to which the proposals would apply. Generally, we expect Commission action to focus narrowly on entities that provide key facilities for 9-1-1 service rather than the broader class of all communications services capable of placing 9-1-1 calls. Like the *Derecho Report*, the *NPRM* defines “9-1-1 service provider” as a communications provider “responsible for routing and delivering 9-1-1 calls to PSAPs.”¹⁹³ Under current technologies, these providers are typically ILECs, although the transition to NG9-1-1 may broaden the class of entities that provide 9-1-1 service in the future.¹⁹⁴ The *NPRM* therefore asks whether the Commission should codify a definition of the term “9-1-1 service provider” that clarifies the extent, if any, to which the proposals would apply to non-ILEC providers of 9-1-1 service.

11. We anticipate that the proposals in this Notice would apply to all 9-1-1 service providers, and tentatively define that term to include all entities, including ILECs, that provide 9-1-1 call routing, ALL, emergency services Internet protocol networks (ESInets), and similar services directly to a PSAP.¹⁹⁵ The transition to NG9-1-1 may allow other service providers to perform similar functions, and we seek comment on the degree to which the proposals should apply to other types of wireline service providers, wireless service providers, interconnected VoIP service providers, or other potential means of reaching a PSAP as NG9-1-1 broadens the range of entities capable of delivering 9-1-1 service. We also seek comment on whether there should be a cost-recovery mechanism for entities regulated as common carriers under Title II of the Communications Act to the extent not already provided under state tariffs.

12. *Incumbent Local Exchange Carriers (ILECs)*. Neither the Commission nor the SBA has developed a small business size standard specifically for incumbent local exchange services. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under

¹⁹¹ U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, tbl.427 (data cited therein from 2007).

¹⁹² The 2007 U.S Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89,476 small governmental organizations in 2007. If we assume that county, municipal, township and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, the total of these organizations is 52,125. If we make the same assumption about special districts, and also assume that special districts are different from county, municipal, township, and school districts, in 2007 there were 37,381 special districts. Therefore, of the 89,476 small governmental organizations documented in 2007, as many as 89,506 may be considered small under the applicable standard. This data may overestimate the number of such organizations that has a population of 50,000 or less. U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, tpls.426, 427 (data cited therein are from 2007).

¹⁹³ *Derecho Report* at 9, n.23.

¹⁹⁴ *See id.*

¹⁹⁵ The *NPRM* also proposes revisions to the Commission’s outage reporting rules that could affect a broader range of service providers currently required to notify PSAPs of outages that potentially affect a “911 special facility.” *See* 47 C.F.R. § 4.9(a)(4) (cable providers); 47 C.F.R. § 4.9(c)(2)(iv) (satellite providers); 47 C.F.R. § 4.9(e)(5) (wireless providers); 47 C.F.R. § 4.9(f)(4) (wireline providers) 47 C.F.R. § 4.9(g)(i) (interconnected VoIP providers).

that size standard, such a business is small if it has 1,500 or fewer employees. Census Bureau data for 2007 show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had had employment of 1,000 employees or more. Thus under this category and the associated small business size standard, the majority of these incumbent local exchange service providers can be considered small.¹⁹⁶

13. The Commission has included small incumbent LECs in this present RFA analysis. As noted above, a “small business” under the RFA is one that, *inter alia*, meets the pertinent small business size standard (e.g., a telephone communications business having 1,500 or fewer employees), and “is not dominant in its field of operation.”¹⁹⁷ The SBA’s Office of Advocacy contends that, for RFA purposes, small incumbent LECs are not dominant in their field of operation because any such dominance is not “national” in scope.¹⁹⁸ The Commission has therefore included small incumbent LECs in this RFA analysis, although the Commission emphasizes that this RFA action has no effect on Commission analyses and determinations in other, non-RFA contexts.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

14. The actions proposed in the *NPRM* could require 9-1-1 service providers to take a range of actions to strengthen the Nation’s 9-1-1 infrastructure in the areas of circuit diversity, central office backup power, and network monitoring and control. Specific regulatory obligations would depend upon the approach chosen to implement each of these objectives. Requirements for compliance could range from periodic reporting on whether 9-1-1 service providers are voluntarily implementing best practices, to mandatory standards for 9-1-1 network reliability codified in the Commission’s rules and subject to its enforcement powers. Service providers also could be required to periodically certify that they have adequate internal controls to ensure network reliability and inform senior management of any significant vulnerabilities. Because many 9-1-1 service providers already implement some or all of the relevant best practices on a voluntary basis, the additional burden of compliance with these requirements may be minimal.

15. Generally, the reporting and certification approaches would likely require more recordkeeping and information collection than the codification-and-enforcement approach, which would focus on the actual implementation of best practices. However, reporting and certification may give service providers more flexibility in designing and maintaining their networks while ensuring that they remain accountable for the results of their decisions. At a minimum, 9-1-1 service providers would be required to keep records of, and disclose to the Commission, the extent to which they have implemented the best practices discussed in the *NPRM*. At a maximum, they would be required to comply with reliability standards enforced by the Commission, potentially requiring changes to networks that do not currently meet these

¹⁹⁶ *Information: Subject Series – Establishment and Firm Size: Employment Size of Firms for the United States: 2007 Economic Census*, U.S. CENSUS BUREAU, http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ5&prodType=table (last visited Feb. 19 2013).

¹⁹⁷ 5 U.S.C. § 601(3).

¹⁹⁸ Letter from Jere W. Glover, Chief Counsel for Advocacy, U.S. Small Bus. Admin, to William E. Kennard, Chairman, FCC (filed May 27, 1999). The Small Business Act contains a definition of “small business concern,” which the RFA incorporates into its own definition of “small business.” 15 U.S.C. § 632(a); 5 U.S.C. § 601(3). SBA regulations interpret “small business concern” to include the concept of dominance on a national basis. 13 C.F.R. § 121.102(b).

standards.

16. The *NPRM* also proposes revisions to Section 4.9 of the Commission's rules to clarify service providers' obligations to notify PSAPs of 9-1-1 outages. The *NPRM* seeks comment on this objective, as well as on the substantive terms of the reporting obligation. Text of the proposed rules is attached as Appendix B.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

17. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include (among others) the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.¹⁹⁹

18. The approaches proposed in the *NPRM* are intended to complement and strengthen, not to replace, the Commission's current approach of encouraging service providers to voluntarily implement best practices and measuring compliance through outage reporting. Thus, small entities with limited resources would continue to enjoy many of the benefits of the current regime, including a general focus on network performance and reliability rather than specific design requirements. The Commission has traditionally considered this approach a more flexible and less costly alternative to more comprehensive regulation, and the *NPRM* would preserve those advantages in large part.

19. To the extent that the *NPRM* would impose new obligations on small entities, we seek comment on alternatives including (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.²⁰⁰ Which of the proposed approaches do small entities find particularly difficult or costly to comply with, and how could those difficulties be addressed through modifications or exemptions? What would be the effect on public safety of exemptions from 9-1-1 service requirements, regardless of cost?

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rule

None.

¹⁹⁹ 5 U.S.C. § 603(c).

²⁰⁰ *Id.*

APPENDIX B

Proposed Rules

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend Part 4 of Title 47 of the Code of Federal Regulations (C.F.R.) as follows:

PART 4 – DISRUPTIONS TO COMMUNICATIONS

1. Section 4.9 is amended by amending paragraphs (a)(4), (c)(2)(iv), (e)(5), (f)(4), and (g)(1)(i) to read as follows:

§ 4.9 Outage reporting requirements – threshold criteria.

* * * * *

(a) *Cable*. * * * * * (4) Potentially affects a 911 special facility (as defined in paragraph (e) of § 4.5), in which case they also shall notify immediately by telephone and in writing via electronic means, any official who has been designated by the management of the affected 911 facility as the provider's contact person(s) for communications outages at that facility, and they shall convey all available information that may be useful to the management of the affected facility in mitigating the effects of the outage on callers to that facility. This information shall include, at a minimum, the nature of the outage, the estimated number of users affected or potentially affected, the location of those users, the actions being taken by provider to address the outage, the estimated time at which service will be restored, recommended actions the impacted 911 special facility should take to minimize disruption of service, and the sender's name, telephone number and email address at which the sender can be reached. Not later than 72 hours after discovering the outage, the provider shall submit electronically an Initial Communications Outage Report to the Commission. Not later than thirty days after discovering the outage, the provider shall submit electronically a Final Communications Outage Report to the Commission. The Notification and the Initial and Final reports shall comply with all of the requirements of § 4.11.

* * * * *

(c) *Satellite*. * * * * * (2)(iv) Potentially affecting a 911 special facility (as defined in paragraph (e) of § 4.5), in which case they also shall notify immediately by telephone and in writing via electronic means, any official who has been designated by the management of the affected 911 facility as the provider's contact person(s) for communications outages at that facility, and they shall convey all available information that may be useful to the management of the affected facility in mitigating the effects of the outage on callers to that facility. This information shall include, at a minimum, the nature of the outage, the estimated number of users affected or potentially affected, the location of those users, the actions being taken by provider to address the outage, the estimated time at which service will be restored, recommended actions the impacted 911 special facility should take to minimize disruption of service, and the sender's name, telephone number and email address at which the sender can be reached.

* * * * *

(e) *Wireless*. * * * * * (5) That potentially affects a 911 special facility (as defined in paragraph (e) of § 4.5), in which case they also shall notify immediately by telephone and in writing via electronic means, any official who has been designated by the management of the affected 911 facility as the

provider's contact person(s) for communications outages at that facility, and they shall convey all available information that may be useful to the management of the affected facility in mitigating the effects of the outage on callers to that facility. This information shall include, at a minimum, the nature of the outage, the estimated number of users affected or potentially affected, the location of those users, the actions being taken by provider to address the outage, the estimated time at which service will be restored, recommended actions the impacted 911 special facility should take to minimize disruption of service, and the sender's name, telephone number and email address at which the sender can be reached. In determining the number of users potentially affected by a failure of a switch, a concentration ratio of 8 shall be applied. For providers of paging service solely, however, the following outage criteria shall apply instead of those in paragraphs (b)(1) through (b)(3) of this section. Notification must be submitted if the failure of a switch for at least 30 minutes duration potentially affects at least 900,000 user-minutes. Not later than 72 hours after discovering the outage, the provider shall submit electronically an Initial Communications Outage Report to the Commission. Not later than thirty days after discovering the outage, the provider shall submit electronically a Final Communications Outage Report to the Commission. The Notification and the Initial and Final reports shall comply with all of the requirements of § 4.11.

* * * * *

(f) *Wireline*. * * * * * (4) Potentially affects a 911 special facility (as defined in paragraph (e) of § 4.5), in which case they also shall notify immediately by telephone and in writing via electronic means, any official who has been designated by the management of the affected 911 facility as the provider's contact person(s) for communications outages at that facility, and they shall convey all available information that may be useful to the management of the affected facility in mitigating the effects of the outage on callers to that facility. This information shall include, at a minimum, the nature of the outage, the estimated number of users affected or potentially affected, the location of those users, the actions being taken by provider to address the outage, the estimated time at which service will be restored, recommended actions the impacted 911 special facility should take to minimize disruption of service, and the sender's name, telephone number and email address at which the sender can be reached. Not later than 72 hours after discovering the outage, the provider shall submit electronically an Initial Communications Outage Report to the Commission. Not later than thirty days after discovering the outage, the provider shall submit electronically a Final Communications Outage Report to the Commission. The Notification and the Initial and Final reports shall comply with all of the requirements of § 4.11.

* * * * *

(g) *Interconnected VoIP Service Providers*. * * * * * (1)(i) Within 240 minutes of discovering that they have experienced on any facilities that they own, operate, lease, or otherwise utilize, an outage of at least 30 minutes duration that potentially affects a 911 special facility (as defined in paragraph (e) of § 4.5), in which case they also shall notify immediately by telephone and in writing via electronic means, any official who has been designated by the management of the affected 911 facility as the provider's contact person(s) for communications outages at that facility, and the provider shall convey all available information that may be useful to the management of the affected facility in mitigating the effects of the outage on efforts to communicate with that facility. This information shall include, at a minimum, the nature of the outage, the estimated number of users affected or potentially affected, the location of those users, the actions being taken by provider to address the outage, the estimated time at which service will be restored, recommended actions the impacted 911 special facility should take to minimize the disruption of service, and the sender's name, telephone number and email address at which the sender can be reached; or * * * * *

**STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI**

Re: *Improving 911 Reliability*, PS Docket No. 13-75; *Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60.

I'd like to salute the many representatives of PSAPs – 9-1-1 call centers – from around the country who are in the audience today. We appreciate the work you do every day to keep our nation safe, and our action today is intended to ensure that the communications technology you need is there when you need it most – for you and for the millions of Americans you protect.

I'd also like to recognize Barbara Jaeger, President of the National Emergency Number Association. NENA has been a strong advocate on behalf of 9-1-1 professionals, and consistently helpful in our efforts to improve public safety communications.

Last June, 9-1-1 call centers across the Midwest and Mid-Atlantic states got a wake-up call when the derecho storm struck, causing dangerous 9-1-1 outages. In some instances, this lasted for several days. All outages are absolutely unacceptable. Especially, when it comes to communicating with emergency personnel during disasters, our policy has to be zero tolerance for outages. So we immediately launched an investigation, and two months ago our Public Safety Bureau issued a strong and thorough report examining the failures of 9-1-1 communications after the derecho.

A key take-away from that report was that many of the problems encountered could have been avoided if best practices for improving reliability had been in place and rigorously followed. Best practices don't protect the people if they are not put in place. We must ensure that these best practices are put into practice. Today, the Commission takes an essential step to do so – to ensure Americans can rely on 9-1-1 networks in the event of major disasters.

Today's NPRM proposes that 9-1-1 service providers regularly audit 9-1-1 circuits for physical diversity, improving network reliability and resiliency by helping identify and correct single points of failure. It also proposes ensuring 9-1-1 providers maintain adequate central office backup power, supported by appropriate maintenance, testing, and records retention. And it promotes physically diverse network monitoring and control links, providing increased resiliency and accurate situational awareness during communications outages.

Implementation approaches range from reporting and certification requirements to mandatory reliability standards, enforced through inspections and compliance reviews. Building the record is vital, debate is essential, and the Commission must always do what is necessary to prevent 9-1-1 outages from happening again.

The Bureau's derecho report also found that multiple jurisdictions did not receive adequate notice of 9-1-1 service disruptions during and after the storm. The NPRM proposes changes to the Commission's current outage-reporting rules to clarify service providers' responsibility to notify 9-1-1 call centers of communications outages. Proposed language adds specificity to this notification requirement to ensure that 9-1-1 call centers receive timely and actionable notice of outages affecting 9-1-1 service, minimizing any disruption to emergency response.

This Commission action will have greatest immediate effect on entities that currently route and deliver 9-1-1 calls to call centers. The NPRM also recognizes the transition to more IP-based and wireless networks and seeks comment on a range of entities likely to provide 9-1-1 services in the future.

In particular, the NPRM supports transition to NG9-1-1 while ensuring that 9-1-1 service providers are held to high standards of reliability, both now and in the future.

Today's action continues our work to tackle these and other 9-1-1-related issues. For example, in the last two years we initiated text-to-911 on mobile phones, launched wireless emergency alerts to allow local authorities to send text to citizens in emergencies, and are improving location accuracy for mobile 9-1-1 so emergency personnel can more quickly locate people in need.

I want to thank the Public Safety Bureau for their work on this item, and all they've been doing the past few years to ensure that 9-1-1 and our communications networks are there for the American people when they need them most.

**STATEMENT OF
COMMISSIONER ROBERT M. McDOWELL**

Re: *Improving 911 Reliability*, PS Docket No. 13-75; *Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60.

One of the core missions of our government is to keep the American people safe and help them in times of crisis. Part of Congress's mandate to the Commission is to ensure that our nation's communications infrastructure remains functional during natural disasters and crises triggered by human actions. All too often, during a catastrophe, just as we need communications systems the most is when they have been disrupted, impaired or overwhelmed. Today, we seek the American people's comments on options aimed to improve the reliability and resiliency of our nation's communications infrastructure. I don't necessarily agree with every idea in this notice, but I do think it is important for us to seek and gather the data and opinions of all interested stakeholders before going any further.

By way of background, the damage caused by last summer's so-called "derecho" storm in the Mid-Atlantic region was simply overwhelming. This destructive windstorm came with little warning and left millions without electrical power, damaged communications systems and knocked out 9-1-1 services. As this notice states, 77 public safety answering points, or "PSAPs," serving more than 3.6 million people in six states lost some degree of connectivity. Upwards of 2.5 million people in the greater Washington, DC area alone were without access to 9-1-1 services as a result of this powerful natural phenomenon. The FCC's Public Safety and Homeland Security Bureau's investigation concluded that many of these failures could have been prevented with 9-1-1 circuit auditing, reliable and functional backup power, monitoring systems and proper implementation of already-crafted industry best practices.

In the immediate wake of the derecho, Chairman Genachowski and I discussed the urgent need to investigate what went wrong and how the Commission could help prevent such tragedies in the future. The response from the Chairman, our fellow Commissioners and the bureaus was swift and thorough. All of them should be commended, as should many state and local public safety agencies, along with industry, for their efforts to learn the truth about what went wrong so we can prepare for tomorrow's emergency situations.

I am pleased that we seek information regarding the costs and benefits of the various options contained in this notice. The Commission has provided some rough cost estimates, and I hope that industry takes this opportunity to provide granular, network-specific data regarding the projected costs of implementing the various proposals. I have long advocated performing *bona fide* cost-benefit analyses before adopting new rules.

Similarly, I am encouraged that we seek comment on our statutory authority to adopt regulations regarding the reliability of 9-1-1 communications networks, along with whether the Commission should review and sunset any requirements it may impose as an outcome of this notice.

I do, however, have concerns that, if the Commission decides to follow a path towards reliability requirements based on a set of standards or best practices, the Commission could unintentionally stifle technological innovation and 9-1-1 communications improvements. We must ensure that any FCC rules allow service providers the flexibility to manage and upgrade their network configurations, including those components that improve 9-1-1 communications reliability, such as backup power and monitoring systems. Furthermore, rules ordering the Commission to conduct compliance reviews and site inspections of 9-1-1 service provider facilities to monitor compliance with industry standards or new Commission requirements could be unduly burdensome on the Commission's limited resources.

I would like to thank the Chairman for incorporating many suggested edits. Specifically, I am pleased that this notice seeks data and information regarding 9-1-1 communications service providers'

implementation of and experiences with industry best practices. A fact-driven analysis warrants a public record that contains nationwide data as opposed to information supplied by a couple of providers regarding the effects of a specific storm on a particular area. I am also pleased that the notice inquires about improvements implemented to increase reliability based on the lessons learned from the derecho, along with whether best practices should be revised and how they should be used going forward.

Finally, I would like to thank the dedicated staff of the Public Safety and Homeland Security Bureau for their efforts in collecting and analyzing information in the aftermath of the derecho, issuing the bureau report, and preparing this notice. I also know that you are busy organizing workshops and compiling data regarding what we can learn from the effects of Hurricane Sandy. I am grateful for everything you do to ensure that Americans have access to emergency services when they are needed most. Thank you.

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: *Improving 911 Reliability*, PS Docket No. 13-75; *Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60.

This NPRM on improving the reliability of 9-1-1 communications networks sends an important message about how serious this Commission takes its statutory obligation to promote the safety of life and property through the use of wire and radio communication. Congress not only made public safety communications a fundamental purpose for creating this agency almost 80 years ago, it passed more recent laws in 1999 and 2008 that specifically direct us to ensure the availability of emergency 9-1-1 service throughout the country.

Consistent with these Congressional directives, the Commission should take appropriate, corrective action if it learns of any significant problem with 9-1-1 service. As we know, the June 2012 Derecho not only caused several deaths and widespread property damage, it also impaired the ability of millions of Americans to access 9-1-1 services and left certain areas without 9-1-1 for several days. It was therefore incumbent upon the Commission to swiftly and thoroughly investigate why these substantial service outages occurred and find ways to minimize the risks of them ever happening again.

I commend Chairman Genachowski for making this investigation a top priority. Under the expert leadership of David Turetsky, the staff conducted a comprehensive inquiry. It reviewed more than 500 network outage reports and interviewed 28 PSAPs, numerous state and county officials, representatives of eight communications providers, as well as battery and equipment manufacturers.

The results of those investigations are, unfortunately, somewhat troubling. To promote network reliability, the Commission has traditionally used a light regulatory touch, preferring voluntary commitments to industry best practices. But this approach only works if communications providers are actually following these best practices. What the staff uncovered, however, was that with a number of communications providers, this was not the case. Service disruptions were found to be caused by communications providers failing to have adequate plans and systems in place in cases of storms and other inclement weather events, and the Bureau concluded that these failures could, and would have been avoided, if providers had followed industry best practices and other sound engineering principles.

This is unacceptable. It is now appropriate and timely for the Commission to propose rules to ensure that communications companies are following well-established practices to promote reliability. At a minimum, these practices should include what our technical staff recommended in the Derecho Report: auditing the physical routes of 9-1-1 networks, ensuring physical diversity of monitor and control links, backup power at central offices, and giving PSAPs more information when service outages occur. The NPRM seeks comments on the best approach to implement these recommendations and offer four possible methods: reporting, certification, or compliance review requirements. Whichever approach we ultimately adopt, we must be certain that our licensees are meeting their obligations to allow consumers to reach 9-1-1 when they need it the most. I was also pleased to see that we are asking how the proposals should apply to IP networks and facilities, such as data centers that host NG9-1-1 services.

I would like to especially thank David, Lisa Fowlkes, Jeff Goldthorp, Lauren Kravetz, and the other talented staff members in the Public Safety Bureau for their work on this item.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Improving 911 Reliability*, PS Docket No. 13-75; *Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60.

Last night, I had the privilege of joining several hundred public safety officials to celebrate our nation's emergency calling system at the 9-1-1 Honors Gala. This is a great event every year, but this is also a special year for 9-1-1 history buffs.

After all, it was 45 years ago when the first 9-1-1 call was made in Haleyville, Alabama. And it was ten years ago when the Congressional Next Generation 9-1-1 Caucus was first established to create a bipartisan voice to support our nation's 9-1-1 systems. Today this Caucus is a force for good, led by Senator Amy Klobuchar, Senator Richard Burr, Representative Anna Eshoo, and Representative John Shimkus. It was also ten years ago when the NG9-1-1 Institute was established—a non-profit organization that helps deploy and advance next generation 9-1-1 services across the country. But history aside, last evening was an opportunity to celebrate the everyday heroes who run our 9-1-1 call centers, answer their phones with steely calm, and help ensure that help is on the way.

Because that is really what this is all about. You may only make one 9-1-1 call in your life, but as the old saw goes, it will be the most important call you ever make. You need to know that your call will be answered.

Yet last year, when the Derecho storm struck the Midwest and Mid-Atlantic, too many 9-1-1 calls were not answered. Seventy-seven public safety answering points spanning six states lost some connectivity. This affected more than 3.6 million people. Seventeen 9-1-1 call centers lost service completely, leaving over two million people without access to 9-1-1.

Just after the Derecho, I visited the 9-1-1 center in Fairfax County, one of the public safety answering points that was unable to answer emergency calls. The head of Fairfax County's Department of Public Safety Communications described an eerie quiet in the aftermath of the storm, as the calls into 9-1-1 quickly and implausibly ceased. Something was not right; something was clearly broken.

Which brings us to the Commission's efforts today to fix these problems. As a result of our investigation into communications failures during the Derecho, we now have more clarity about what happened. We know that back-up generators and switches failed. We know that power failures undermined monitoring capabilities. We also know that 9-1-1 centers were left in the dark without service—and without notice.

So the proposals before us build on what we now know: the need for better back-up power at central offices, the need for improved 9-1-1 circuit auditing, the need for more diverse monitoring systems, and the need for more extensive reporting to 9-1-1 personnel on the front lines, answering calls. They are commonsense solutions. They should put us on the road toward making sure that failures like the ones we saw following the Derecho never happen again. For my part, I want these policies put in place by the first anniversary of this storm. I also recognize that as we move forward in this proceeding, there will be discussion about the need to take each step proposed. There will be concerns about cost. These are fair. Debate is a necessary—and healthy—part of our process.

But there should be no debate about why this conversation matters. Because this is not just a conversation about technical fixes. We must never forget this is a conversation about real people and their safety. Last night, I heard chilling stories from 9-1-1 operators at work in places like Aurora, Colorado and Newtown, Connecticut—just down the road from where I grew up. Last night and even now, the mention of these places conjures up difficult images. Their memories rightfully sting. And their

horror leaves us justifiably unsettled.

But in our haze of grief and outrage, we should never forget who was there to help. The calls that came tumbling into our 9-1-1 centers after these and other incidents unleashed the best that our public safety systems have to offer. They sent help, they offered hope, and they saved lives.

Our rulemaking today is a small way of honoring their efforts, and a big part of making sure that our nation's 9-1-1 systems are dependable. It is also an essential part of making sure that the frailties we saw in the Derecho last year are fixed and that every call to 9-1-1 is answered.

I support this rulemaking. Thank you to the Public Safety and Homeland Security Bureau for your work to deliver it to us today.

**STATEMENT OF
COMMISSIONER AJIT PAI**

Re: *Improving 911 Reliability*, PS Docket No. 13-75; *Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60.

When Americans dial 911, they understand that they won't reach Halle Berry,²⁰¹ but they do expect to reach one of the real-life heroes who staff our nation's public safety answering points (PSAPs). It doesn't matter if the call is placed because of a personal emergency or a widespread natural disaster. Whether on a landline or cellphone, using voice over Internet Protocol service or a circuit-switched loop, our citizens expect to reach an emergency operator each and every time. And that's precisely what today's Notice of Proposed Rulemaking is about: keeping the promise to consumers that when they call 911, emergency personnel will answer.

That promise has long been a core mission of the FCC. Indeed, in the very first sentence of my very first statement at an FCC meeting, I pointed out that the very first section of the Communications Act of 1934 established the Commission in part "for the purpose of promoting safety of life and property through the use of wire and radio communications."²⁰² Staying true to that statutory purpose in a time of technological change is a challenge we have to meet.

Fortunately, everyone agrees that improving the resilience of communications networks—and especially those networks that serve PSAPs—should be one of our major goals moving forward. That's one thing we've learned at the two field hearings we have held so far on the subject.

Even more fortunately, we're not writing on a blank slate. The Public Safety and Homeland Security Bureau compiled an extensive report on what went wrong after the derecho that swept across several states last June. The FCC's Communications Security, Reliability, and Interoperability Council has developed best practices. The Network Reliability Steering Committee of the Alliance for Telecommunications Industry Solutions has provided technical and operational expert guidance when needed. And the National Emergency Number Association, the National Association of State 9-1-1 Administrators, and the Association of Public-Safety Communications Officials have developed and disseminated information about best practices to first responders across the country.

That's why I am so glad that my colleagues accepted my suggestion to seek input from another group of stakeholders that's been working on matters of reliability and resiliency for years: the states, state commissions, and PSAPs. These entities handle many of the regulatory nuts and bolts of our emergency communications system. They establish 911 service tariffs, collect and distribute 911 funds, and negotiate 911 service contracts. Day in and day out, our state and local counterparts have been doing their part to keep their emergency calling centers operational to serve the American public, and I hope they will share their expertise.

Common sense isn't the only thing driving the need for consultation—so is the law. The New and Emerging Technologies 911 Improvement Act of 2008 is a good example.²⁰³ This Act requires us to "work cooperatively with public safety organizations," among others, "to develop best practices that promote consistency, where appropriate," for 911 service. Among these best practices are "network

²⁰¹ Cf. *The Call* (Troika Pictures *et al.* 2013).

²⁰² *Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency*, PS Docket No. 11-15, Notice of Inquiry, 27 FCC Rcd 6402, 6421 (2012) (Statement of Commissioner Ajit Pai), available at <http://go.usa.gov/2Ut9>.

²⁰³ Pub. L. No. 110-283.

diversity requirements,” “call-handling in the event of call overflow or network outages,” and “certification and testing requirements” for service to PSAPs.²⁰⁴ I look forward to hearing from stakeholders how statutory responsibilities like these should shape our work going forward.

In that same vein, I hope we will keep in mind an even more recent statute, the Next Generation 9-1-1 Advancement Act of 2012.²⁰⁵ Many of the best practices discussed in the Notice—such as call overflow rerouting, link-failure rerouting, physical and logical network diversity, and continuous monitoring—are built into NG911 networks. Indeed, the Bureau’s derecho report noted that had NG911 “architectures and capabilities been in place . . . they likely could have significantly lessened the derecho’s impact on emergency communications.”²⁰⁶ Facilitating that deployment should be a national priority. The Notice rightly acknowledges as much, in part by seeking comment on whether any rules we adopt in this proceeding should contain a sunset provision. Such a provision would reflect the fact that rules adopted today may not be appropriate tomorrow—especially not after the widespread deployment and adoption of NG911.

I am also glad that today’s Notice proposes to evaluate our options through the lens of cost-benefit analysis. Cost-benefit analysis does not mean automatic support for or opposition to any proposed regulation. When properly applied, however, it does lead to smart regulation. Of course, the value of cost-benefit analysis is entirely dependent on the data we use. So I hope stakeholders will help us understand more thoroughly the actual costs of some of our proposals, especially where we do not have concrete evidence for the estimates used in the Notice to calculate costs.

In sum, I am pleased to support today’s Notice. It is imperative that we take the necessary action, in conjunction with the states, in order to make sure that every American can reach an emergency operator when she or he dials 911. That promise has become part of our social contract, and it is a promise we must keep.

²⁰⁴ 47 U.S.C. § 615a-1(h)(2)–(4).

²⁰⁵ Pub. L. No. 112-96, Title VI, Subtitle E.

²⁰⁶ FCC PUB. SAFETY & HOMELAND SEC. BUREAU, IMPACT OF THE JUNE 2012 DERECHO ON COMMUNICATIONS NETWORKS AND SERVICES: REPORT AND RECOMMENDATIONS at 44 (PSHSB rel. Jan. 10, 2013), *available at* <http://go.usa.gov/2UMP>.