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

COMMENTS OF
THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

The Pennsylvania Public Utility Commission (Pa. PUC) files these Comments on the Federal Communications Commission (FCC or Commission) Notice of April 15, 2013 (April Notice). The April Notice seeks input on improving the reliability and resiliency of the communications infrastructure necessary to ensure the continued availability of 9-1-1 emergency service systems (911), particularly in the wake of major disasters. The April Notice followed publication in the Federal Register on April 12, 2013, of the FCC’s Notice of Proposed Rulemaking on 911 (911 NOPR) released March 20, 2013. The April Notice set deadlines of May 13, 2013, and May 28, 2013, respectively, for Comments and Replies.

The Pa. PUC appreciates an opportunity to file Comments. As an initial matter, these Pa. PUC Comments should not be construed as binding on the Pa. PUC in any matter before the Pa. PUC. Moreover, these Pa. PUC Comments could change in response to later events, including Ex Parte filings or the review of other filed Initial and Reply Comments and legal or regulatory developments at the state or federal level. Finally, the Pa. PUC’s participation in this proceeding is without prejudice to the ongoing appellate litigation that is currently pending between the Pa. PUC, other parties, and the FCC before the U.S. Court of Appeals for the 10th Circuit at Docket Nos. 10-1099, et seq.
The FCC’s *Derecho Report* examined sporadic and system-wide failures of 911 networks in the June 2012 derecho, a weather phenomenon of high winds exceeding 58 mph over a range of territory greater than 240 miles. The FCC seeks input on what single or combination of physical diversity, auditing, reporting, certification, reliability, and/or compliance testing mandates are needed. The FCC does so in light of the fact that most of the substantive failures occurred largely because providers did not implement, or audit for, compliance with industry-developed best practices, particularly network physical diversity “and a lack of backup power in central offices” (COs).\(^1\) This raises questions about the interplay of voluntary efforts and regulatory mandates, given that the failures in the *Derecho Report* were avoidable by best practices’ implementation and testing.\(^2\)

**Issues Raised in the April Notice.**

The April Notice raises three general issues concerning 911. The first general issue is defining “911 service providers” going forward because of data centers and Next Generation 911 (NG 911). The second general issue is the appropriate regulatory methodology to ensure the continued reliability of 911 and NG 911, particularly with detailed costs and benefits. Finally, the FCC wants information on state commissions’ practices and experience which ensure 911 and NG 911 reliability and survivability..

The FCC seeks input on four detailed issues: (1) Routine 911 Auditing; (2) Adequate Central Power Backup; (3) Physical Diversity in 911 Networks; and (4) Improved Public Safety Answering Point (PSAP) Notification. These concerns are addressed in the *Derecho Report*.

On *Routine 911 Auditing*, the FCC notes that inadequate 911 access services arose because there is no mandate to regularly audit the physical routes and automatic location

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2. *911 NOPR*, paragraphs 1, 5, 11, 12 and 14.
identification (ALI) links in 911 networks. This raises the concern of whether there should be reasonable redundancy in 911 networks.

On Sufficient Central Power Backup, the FCC recognizes that power supply batteries, and standby or portable generators are used for backup throughout the nation to ensure uninterrupted power supplies for critical 911 network nodes such as the COs. The Derecho Report noted the failure of tandem standby generators in particular. The FCC seeks input on requirements and costs for central power backup, including that for testing and maintenance, given that 75% of nation’s 366 major metropolitan areas lack “redundant monitoring access” for 911 networks “through physically diverse links.”

On Physical Diversity, the absence of 911 network circuit diversity causes 911 systems to fail if a portion of the network fails. On fiber networks, physical diversity is absent when separate strands of the same facility – fiber – are used for data transmission. The FCC asks if there should be physical diversity in the Network Operations Centers (NOCs), as a function of monitoring for network node failures, e.g., critical COs deprived of adequate power supplies, given the current use of single-point NOCs and the cascading effect of their failure in the Derecho Report.

On PSAP Monitoring, the FCC proposes to amend Section 4.9 of the existing rules, 47 CFR § 4.9, to include notification of outages to PSAPs. The FCC seeks input on what specific details for accomplishing this notification may be necessary.

Summary of the Pa. PUC Comments

General Issues. The FCC should define “911 Service Providers” using the legal definitions for “telecommunications” or “information service,” and classify all entities or networks directly or indirectly involved with 911 calls to a PSAP as telecommunications. This avoids potential legal issues of alleged federal preemption of state law and ensures

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3 911 NOPR, ¶ 66, at 28.
that 911 Service Providers understand the importance of this common carrier mandate for 911 under state and federal law.

The best way to prevent future 911 system or network failures is to impose best practices as federal regulatory minimums. Compliance should be tested and monitored. 911 Service Providers should be required to submit certified reports to the FCC on compliance and provide those to the states or give the states simultaneous access. The process to implement an existing or future final best practice should be one in which auditing, testing, certified reporting, and a remedial plan and timeline are done the first year with implementation completed by the end of the 2nd year.

Future regulatory mandates should be imposed based on best practices developed using an industry-government consultation process that expressly includes the states and the state utility commissions. An exception may be needed where the immediate implementation of existing best practices is necessary based on the Derecho Report and the 911 NOPR.

Regulatory mandates should have annual audits. Certified reports made under oath by the CEO, CFO, and CTA, should detail annual testing using active load. Copies of all required reports and testing results, including service outages, should be provided to state commissions simultaneous with reporting to the FCC. A 911 Service Provider who shows compliance over a 3 year process should be permitted to reduce their compliance requirements to a bi-annual basis.

Waivers should be permitted for 911 Service Providers in consultation with the states for good cause shown, but only where the petitioner has reasonably comparable alternatives. Cost recovery should be a cost of doing business without an additional federal fee or surcharge to support the FCC’s 911 mandates within the states. The states are and should be able under independent state law to impose appropriate fees for the operation and administration of PSAPs, and use other appropriate funding mechanisms for ensuring the delivery and oversight of 911/E911 access service to their citizens.
These parameters reflect Pennsylvania’s success with 911 – a fact noted, and appreciated, in Footnote 100 of the 911 NOPR.

**Specific Issues.** *Routine Circuit Auditing* should be a federal minimum reflecting best practices, but the states should be able to require more under independent state law. The FCC should use the current industry-government best practices on routine circuit auditing and network diversity. Future best practices development should include the states and their state utility commissions. If the FCC decides to immediately examine routine circuit auditing and diversity, the auditing, testing, certified reporting, and a remedial plan and timeline for that network diversity and routine circuit auditing should occur in the first year. Implementation should be completed by the end of the 2nd year.

*Sufficient Central Power Backup* minimums should be established, including power backup and reasonable capacity requirements. These minimums should apply to all 911 Service Providers and the network, equipment, or facilities used to deliver 911/E911 access services, including IP and VoIP services and wireless services. The final rules must also consider the current power battery backup associated with certain retail broadband access services, such as FiOS, to determine whether it impacts 911 reliability and safety of the nation’s citizens. The FCC’s 911 NOPR may also be an appropriate forum to discuss the need for a public educational effort so that all consumers are aware of the capabilities of and any limitations to the current power battery backup associated with certain retail broadband access services, such as FiOS. These

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4 *Floyd v. Verizon*, Docket No. C-2012-2333157 (Pa. PUC, Order entered April 30, 2013). The Pa. PUC determined that the Commission has subject matter jurisdiction over 911 service in accordance with the state’s Voice Over Internet Protocol Freedom Act at 73 P.S. §§ 2251.4, *et seq.* The Complainant alleged that the Verizon PA FiOS system did not provide sufficient battery backup phone service during a prolonged power outage. The Complainant indicated that she was without phone service and the ability to make a 911 call, if needed, during Hurricane Sandy because she and 500,000 other customers were without power. The Complainant viewed this as an extreme safety concern.

considerations can be explored through an industry-government working group including the states and their state utility commissions.

*Network Monitoring Compliance and Physical Diversity and Control Links* problems can be solved by developing federal minimums to require network diversity through an industry-government process that includes the states and their state utility commissions. The auditing, testing, certified reporting, and a remedial plan and timeline should be done the first year with implementation by the end of the 2nd year. The best place to start is the 75% of America’s 366 metropolitan areas without any redundancy in network monitoring.

*PSAP Reporting* must be expanded to include state commissions and public safety agencies, with due regard for confidentiality and security. All information filed with the FCC, particularly the DORS and DIRS, should also be filed with the states or the states should be granted simultaneous access. This helps the states monitor and enforce FCC rules and states mandates given their expertise and knowledge of state and local circumstances.

**Detailed Discussion**

A. *Pennsylvania Law and Experience.*

*Pennsylvania Law.* 911 issues are addressed by the Pa. PUC and the Pennsylvania Emergency Management Agency (PEMA). The Pa. PUC has authority to set wireline 911 rates to support the administration and operations of 911 PSAPs. The Pa. PUC also has authority to address the administration and provision of 911 for IP-enabled services in the VoIP Freedom Act at 73 Pa.C.S. §§ 2251.1 *et seq.* The Pa. PUC also exercises regulatory oversight over certain categories of providers of retail and wholesale 911/E911 access services.

PEMA oversees PSAP operations in Pennsylvania’s county-based PSAP as well as the Cities of Allentown and Bethlehem using support provided from a surcharge imposed
on wireless and VoIP. Those surcharge revenues are provided to PEMA for allocation to the PSAPs. That process is set out at 35 Pa.C.S. §§ 5301 et seq.

This process has worked well for Pennsylvania. As the FCC notes in Footnote 100 of the 911 NOPR, a 2002 study of 911 calls in Pennsylvania found that, when precise location information was provided with a 911 call, the response time was notably shortened and correlated with a 34% reduction in mortality rates from cardiac arrest.

What 911 issues that have arisen are addressed at the Pa. PUC on an informal basis. The informal communications between carriers, the PSAPs, PEMA, and the Pa. PUC on 911 has generally been adequate.

The Pa. PUC’s outage reporting requirements are set out at 52 Pa.Code § 67.1. Those are applicable to public utilities including wireline telecommunications public utilities. There are no distinct reporting mandates for 911 telecommunications.

The Pa. PUC has had difficulties gaining simultaneous access to information filed with the FCC, particularly the mandatory Network Outage Reporting System (NORS) and voluntary Disaster Information Reporting System (DIRS). Carriers have refused to give information based on confidentiality. The FCC needs to establish federal minimums that provide simultaneous access to and filing of NORS and DIRS information and data with the states.

The FCC must expressly authorize state agencies and carriers responsible for 911/E911 access and connectivity to submit the filings to the states or provide simultaneous access to FCC filings. Any concerns with regulatory confidentiality and homeland security can be addressed by the states, the FCC, and industry. This will help in enforcing state laws as well.
B. **General Issues.**

1. **Definition of 911 Service Providers.** The Pa. PUC supports the FCC’s recent decision to require interconnected VoIP providers to report major disruptions in communications services and recommends that the reporting requirement should be expanded to include the states. The Pa. PUC also supports the FCC’s frank recognition that two circuits riding over the same fiber optic cable do not constitute physical diversity even if they are logically diverse for transmitting data. Consequently, the emergence of fiber networks demonstrates that the development of physical circuit diversity and control link rules cannot be done in a vacuum, but rather, must occur following consultation with industry and the states using a Title II common carrier “telecommunications” definition. The Pa. PUC shares the FCC’s desire to minimize mandates but also recognizes that new rules should reflect NG 911.

   The Pa. PUC does not believe that the technological evolution of telecommunication and communication network technologies and protocols (e.g., IP), is a sound basis for departing from Congress’ definitions, in this case “911 Service Providers.” As the Pa. PUC has pointed out in recent filings with the FCC, the copper-circuit switched network remains of vital importance. This is underscored in the Derecho Report’s recognition that most 911 routing and the delivery of 911/E911 calls is done by ILECs, the largest operators of copper distribution networks.

   The FCC must rely on “telecommunications” or “information service” as defined in federal law and classify 911 Service Providers and any network, facility, or equipment used for 911/E911 access services as telecommunications. The definition should not be limited to “services directly to a PSAP” as discussed in Paragraph 23 of the 911 NOPR. This limited approach risks excluding indirect providers or networks involved with

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911/E911 access services and call traffic. That definitional approach increases the risk of repeating those problems with "least cost router" carriers and rural call completion already under examination by the FCC. 911 is too critical to take that risk, nor can 911/E911 call traffic be subject to any conceivable threshold level of successful completion.

This broader definition brings 911 within the FCC and the states' joint regulatory purview, effectively including data centers and new forms for providing 911/E911 access. This gives the FCC and the states sound legal authority to address public safety concerns in a joint process, particularly on mandatory physical diversity and eliminating risks associated with the provision of critical backup power functionalities.

This broader definition also preserves cooperative federalism with several ancillary benefits. First, it is more consistent with the dual-sovereignty set out in Section 152(b), 47 U.S.C. § 152(b). Second, it expressly preserves independent state law and raises fewer concerns or allegations of constructive federal preemption. Third, this allows states with more stringent mandates to continue enforcing those mandates in addition to those of the FCC. Finally, this provides the FCC with access to state agencies and personnel experienced and capable of addressing 911 compliance issues, a useful resource that the FCC will need if they want to ensure compliance with those minimum federal mandates for 911. Of necessity, the FCC needs a process for ensuring that all 911 Service Providers contribute to the reasonable costs of 911 compliance and reliability without another surcharge.

2. Interplay of Best Practices and Federal Rules. The Pa. PUC agrees with the FCC that action is necessary. The failure to implement best practices led to most of the emergency communications outages addressed in the Derecho Report.

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The Pa. PUC’s approach to addressing 911 issues works for Pennsylvania because it reflects statutory law and Pa. PUC regulations, including Section 67.1 of the Pa. PUC’s regulations. The preservation of this approach is warranted because it works for Pennsylvania and because any adverse consequences would largely be confined to Pennsylvania. This same approach may be insufficient for 911 within the FCC’s purview because failure there could have catastrophic regional or national impacts.

While the FCC must preserve ad hoc practices where they work, the FCC must also impose best practices as minimum federal requirements after they are developed using an industry-government consultative process that includes the states and their state utility commissions. This minimizes cost, enhances reliability, preserves flexibility, and includes timely resolution of 911 problems.

As the FCC is well aware, industry-government working groups, including state utility commissions, have been very successful in addressing key issues on a proactive and retroactive basis in the telecommunications industry. The industry has convened for several years to address a plethora of numbering issues through the North American Numbering Council (NANC), a working group that has included state utility commissions. In addition, the FCC’s Cybersecurity and Communications Reliability Division (CCR) works with the communications industry to develop and implement improvements that help ensure the reliability, redundancy and security of the nation’s communications infrastructure.

The FCC also is continuing its Communications Security, Reliability, and Interoperability Council (CSRIC) for a fourth time. The CSRIC is a federal advisory committee that provides guidance, expertise, and recommendations to the FCC to

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8 CO failures can affect 911/E911 network functionalities across state boundaries. Failure of a CO in State A (e.g., power outage) can affect delivery of ALI functionalities by a 911/E911 wholesale access services provider in non-adjoining State B. See generally In re The Commission’s Investigation Into the Outages of Verizon Maryland Inc. 9-1-1 Network in Maryland, MD PSC Case No. 9265, Direct Testimony of Maureen Davis, Verizon Maryland Inc., August 11, 2011 (the related CO failure had occurred in the State of New Jersey).
improve the security, reliability, and interoperability of the nation’s communications systems. The duties of CSRIC include developing and recommending to the FCC best practices and actions to be implemented to promote reliable communications services, including 911, Enhanced 911, and Next Generation 911 service. The Pa. PUC urges the FCC to continue the development and implementation of best practices as federal minimum requirements so that the nation’s communications networks are reliable in extreme weather conditions.

3. Reporting, Certification, Reliability, and Compliance. The Pa. PUC supports examination of reporting, certification, reliability, and compliance issues, and appreciates the need for scope, granularity, and frequency of any requirements.

Reporting. The Pa. PUC believes that 911 Service Providers must report at least annually to the FCC and the states on compliance with those industry best-practices that are federal minimums or are strongly encouraged. However, the requirements to conduct circuit diversity audits, to file certified reports on the results, and to specify a remedial program and the timeline to address deficiencies should apply only to formal federal regulatory minimums. This should occur on a PSAP-by-PSAP basis. Enforcement can occur by a combination of ad hoc resolution as in Pennsylvania and then formal enforcement as a last resort using Formal Complaints or a Notice of Apparent Liability.

The Pa. PUC supports requiring CSRIC best practice 8-7-5281 as a rule. This requires the design, installation, and maintenance of standby generators used for critical 911 network nodes such as the COs to be on a stand-alone basis as opposed to the interdependent tandem configuration.

Incentives are indispensable to get this done effectively. They could include an approach in which a 911 Service Provider who demonstrates three years of compliance with federal minimums can reduce their reporting from annually to bi-annually. This rewards those willing to dedicate the time and resources needed to ensure compliance
with an existing mandate by compliance costs so those resources can be refocused on new rules or emerging issues.

Certification. The Pa. PUC believes that an objective certification requirement tied to 911 and corporate accountability is necessary given 911’s importance. This should occur when any reporting requirement must be filed. It should reflect the Customer Propriety Network Information (CPNI) rules at Section 64.2009, in which an officer or agent certifies compliance, and Section 302 of Sarbanes-Oxley, in which a Chief Executive Office and Chief Financial Officer certify compliance.

However, the detailed matter of 911 should allow for certification by the Chief Technology Officer (CTO) or their equivalent as well as any CEO or CFO mandate. This has the ancillary benefit of addressing the use of sound engineering practices while providing for an accountability that allows regulators to quickly contact the persons most likely to provide a rapid response. While this may be inappropriate for things like consumer complaints or competitive harm, 911 is critical to human lives and national security. A higher threshold is necessary and appropriate.

Reliability. The Pa. PUC supports the FCC’s willingness to consider using CSRIC best practices as mandates. The Pa. PUC supports CSRIC Best Practice 8-7-0532, which encourages network operators to periodically audit the physical and logical diversity of 911 circuits called for by network design and take appropriate measures. The Pa. PUC also supports CSRIC Best Practice 8-7-5281, which expects the design, installation, and maintenance of standby electric power generators as stand-alone units, effectively discouraging tandem configurations. The Pa. PUC supports the adoption of these best practices as federal minimum rules because they require auditing, testing, certification, implementation and reporting on compliance. These default rules should be subject to waivers for good cause shown but only with the states’ participation and if reasonably comparable alternatives are adequately demonstrated.
C. Specific Issues.

1. Routine 911-Circuit Auditing. The Pa. PUC applauds the FCC’s prior notices to industry concerning compliance with circuit auditing and supports their demonstration that timely circuit auditing could have revealed multiple vulnerabilities. If implemented, these could have reduced the 911/E911 access service failures in Northern Virginia from the June 2012 derecho. The Pa. PUC also applauds Verizon and Frontier’s commitment for the voluntary auditing of 911 circuit diversity and Verizon’s commitment to apply network diversity where it has not done so, a result whereby the loss of one 911 circuit (single point of failure) will no longer result in the loss of all 911 circuits.

The Pa. PUC supports annual auditing for physical diversity to avoid single points for routine 911 circuits. This would, in turn, avoid having the failure of a single point cascade and trigger the loss of all 911 circuits. Routine circuits should be subject to auditing, testing, certified reporting, and any needed remedial plan with a reasonable timeline. This issue should be included as an integral part of the general Reporting, Certification, and Reliability suggestions set out above. The Pa. PUC takes this position in light of the FCC’s indication that the compliance costs would be $2.2 million.

Given the evolution in NG 911, the Pa. PUC believes that the details and granularity for audits and implementation should be developed using a joint industry-government process similar to the CSRIC standards. The states and their state utility commissions must be involved in the process.

The critical role of auditing for physical diversity, however, may warrant an interim requirement directing an audit, testing, certified reporting, and submitting any needed remedial plan in the first year. Implementation of the remedial plan should be completed by the end of the 2nd year.
After that, the FCC should adopt a rule reflecting the best practices developed using the industry-government consultation process. A 911 Service Provider who consistently audits and reports certified results demonstrating compliance with physical diversity for a period of three years should be permitted to reduce the testing, auditing, reporting, and certification requirements to a bi-annual basis. A 911 Service Provider that cannot meet these requirements due to independent considerations should be granted a waiver for good cause shown – so long as the petitioner demonstrates reasonable comparable compliance, and the states have standing to participate in the waiver process.

2. **Sufficient Backup Power at Central Offices.** The Pa. PUC shares the FCC’s very real concern about adequate power backup at COs as discussed in the *Derecho Report*. The Pa. PUC supports the FCC’s effort to set backup power requirements for COs, deciding what constitutes adequate power, and setting the testing, maintenance, and record keeping requirements.

*Central Office Backup Power* should be required for any CO or network node facility, or equipment needed for 911. The auditing, testing, certified report, and remedial plan and timeline should be done the first year and implemented the 2nd year.

The *Derecho Report* identified 911 outages lasting up to two weeks. The Pa. PUC believes that a reasonable interim solution should require backup power in any CO sufficient for 72 hours (absent the delivery of additional fuel for the continuous operation of the standby and/or portable power generators), a standard for traditional networks. Subsequent comments or a later industry-regulator consensus may suggest a more reasonable way as well.

The 911 Service Providers should be responsible for determining what sole or mixed reliance on uninterruptible power supply, batteries, and backup generators are the most effective means for powering any given central office, network facility or equipment so long as its meets a predetermined minimum time period.
Testing should be done on an annual basis. There must be certified reports provided to the FCC and the states. Maintenance should reflect CSRIC 8-7-0662 (exercise backup generators in accord with the manufacturer’s specifications) although that should be extended to any mix of uninterruptible power supply, batteries, and backup generators. The Pa. PUC believes that testing should use the actual site load approach, a testing process where the power is switched off and operations rely on the backup power. The Pa. PUC does not support using simulated load banks, a process that only verifies that the backup power can power a CO.

The Pa. PUC believes that a good place to start is those CSRIC best practices already developed by industry. This includes CSRIC 8-7-5281 (disapproving of interdependent generators), 8-7-0657 (Network Operators, Service Providers, and Property Managers should design standby generator systems for automatic operation and ease of manual operation when required), and particularly 8-7-0662 (exercise backup generators in accord with the manufacturer’s specifications). These could be used as interim rules until there are better industry-regulatory consensus alternatives.

The absence of reliable backup power needs to be addressed, given 911’s importance to public safety. Interim rules could implement the current best practices as the rule. The Pa. PUC strongly supports allowances for waivers for good cause shown, particularly given the FCC’s recognition of the differences between central offices in a large metropolitan area compared to a smaller rural area. Importantly, the incentive bi-annual default should be applicable for compliance shown for 3 years.

The suggestions reflect the Derecho Report’s demonstration that actual implementation and testing would have avoided most Derecho Report 911 network failures.

3. Network Monitoring Compliance. Network Operations Centers (NOCs) perform monitoring, including remote monitoring, of networks with out of state data centers. The Derecho Report recognized that the loss of NOC remote telemetry and
diagnostic capabilities in a single point of failure can, and did, contribute to 911 network failures.

As a general matter, the Pa. PUC supports diversity in network monitoring capabilities compliance, particularly for network nodes and circuits that are crucial for the reliable and robust operation of 911/E911 access services and relevant functionalities (e.g., ALI). Current information indicates that a majority of the 366 metropolitan statistical areas (MSAs) have only a single, non-diverse pathway for network monitoring, including key links between their regional aggregation points and NOCs. Failure of this single pathway can be catastrophic. This is compounded if the CO, facility, or equipment using that single NOC is without adequate power or has not been tested and certified reliable.

The Pa. PUC also supports network diversity given CSRIC 8-7-0532 (network diversity in general) and CSRIC 8-7-0401 (monitor networks to enable quick responses to network issues.). If these best practices are useful for non-911 purposes, it follows that they are equally, if not more, important for 911.

The Pa. PUC endorses Verizon’s approach as an interim solution so long as its implementation does not vitiate state law or centralize regulatory authority. Verizon will redesign their monitoring telemetry network to include more diverse connections and failover (alternative) connections. Verizon notes that it will redesign telemetry edge routers and move all telemetry traffic to the IP network even though visibility of an end office to a NOC would still be affected by power or other outages in that central office. This is an effective interim solution and, in fact, underscores the necessity of mandating backup power at any CO, facility, network, or equipment relied on for 911.

This appears to be an effective interim solution pending development of a best practice. The apparent reliance on single NOCs, however, warrants development of a best practice and its implementation as a rule as soon as practicable.
As with any other intime rule, the 911 Service Providers should complete the auditing, testing, certified report, and remedial plan and timeline in the first year with implementation completed by the end of the 2nd year.

4. **Improved PSAP Notification.** The Pa. PUC shares the FCC’s concern that inadequate or cryptic notices to PSAP operators on outages, particularly during the derecho, raises the need to revise Section 4.9 of the FCC’s rules on notifying the FCC within 120 minutes of an outage.

The Pa. PUC supports the FCC’s proposal to amend the rules to require PSAP notification of outages immediately, by telephone and in writing via electronic means, including, at a minimum, the nature of the outage, the geographic area of the outage, the estimated number of users involved, the location of those users, the actions being taken to address the outage, the estimated time at which service will be restored, recommended actions the affected facility or users should take to minimize service disruptions, and the sender’s name, telephone number, and email address for contact. These requirements go a long way to addressing communications issues with the PSAPs.

This approach, however, is limited because it fails to address the state commissions’ access and receipt of that same information. The Pa. PUC has sometimes had problems getting access to information provided to PSAPs. This applies to the mandatory NORS information, a filing required if an outage is more than 30 minutes and involves more than 900,000 user-minutes. It also applies to the voluntary DIRS information, the web-based system for reporting communications infrastructure status and situational awareness for companies including wireline, wireless, broadcast, and cable providers.

Any final modified Section 4.9 rule must include mandatory filings with, or simultaneous access to, filings made with the FCC for the state commissions or other entities involved with 911 such as PEMA. Those entities should receive a copy of any filing or, at a minimum, obtain notice and simultaneous access to all filings made with
the FCC or communicated to PSAPs. Any ancillary security and confidentiality concerns can be addressed during the rule’s development.

That information for local state commission and emergency management agencies is critical to keeping the public informed. This also helps when apprising local agencies that something more than an ad hoc approach to an outage or series of outages is required. Reliance on local agencies during emergencies ensures that the FCC’s 911 concerns are competently addressed at this local level, a critical need during the derecho.

5. **Cost Recovery.** The Pa. PUC makes these suggestions given the FCC’s information indicating that the costs to implement these kinds of solutions are not that large for the country. However, the recovery of those costs, including the supporting efforts of state commissions, needs to be address. The Pa. PUC believes that 911 is such an important public safety consideration that it is a function of doing business that should not be subjected to surcharge recovery from end-users. Moreover, the Pa. PUC also suggests that state commissions opting to support the FCC’s rules as part of their own 911 law and policy determinations be permitted to assess a small percentage of the 911 Service Providers’ revenues generated within a state to support that work. Otherwise, the states will be burdened with an unfunded mandate while facing difficult public accountability consequences when 911 networks fail, as they did in the derecho.

6. **The Improvement of 911 Reliability and Distributed Networks**

The Pa. PUC observes that the FCC’s 911 *Reliability NOPR* (PS Docket No. 13-75), as well as its previous *Reliability NOI* (PS Docket No. 11-60),\(^9\) appear to be exclusively focused on the survivability and continuous functionality of centralized nodes of wireline and wireless telecommunications and communications networks, e.g., the wireline network COs. Both the 911 *Reliability NOPR* and the *Reliability NOI* do not

\(^9\) In re Reliability and Continuity of Communications Networks, Including Broadband Technologies, et al., Notice of Inquiry, PS Docket No. 11-60 et al., 26 FCC Red 5614 (2011) (*Reliability NOI*).
encompass critical reliability and survivability aspects of evolving networks that are increasingly becoming distributed between the telecommunications carriers and/or communications providers that operate them and provide the core network switching nodes, e.g., the COs, and the end-user consumers that need reliable and survivable capabilities to place 911/E911 calls that will reach the appropriate PSAPs in cases of emergency and especially during periods of inclement weather that cause prolonged interruptions of commercial electric power supplies. If large numbers of end-user consumers lack reliable and survivable capabilities or means to place 911/E911 calls in the first place, the continuous operation of the wireline and wireless network nodes albeit valuable in and of itself, will not be effective for timely end-user access to PSAPs and the appropriate emergency response services.

The Pa. PUC submits that the reliability, survivability, and functionality of telecommunications and communications networks and services that are transitioning through retail and wholesale broadband access and the use of the Internet Protocol (IP), are increasingly becoming distributed in nature and provide a joint responsibility for end-user consumers. Such responsibility may be understood, consciously undertaken, and actively managed by institutional business or enterprise customers that operate complex and multi-purpose local or wide area networks of their own, but the same cannot be easily said for residential end-user consumers that often lack the technological knowledge, sophistication, and skills to address network-related reliability and survivability issues on their end. The promulgation and adoption of adequate technical standards that can be applicable to the reliability and survivability of distributed retail broadband access network equipment installed at the premises of residential end-users and adequate levels of consumer education can dramatically improve the capabilities of large numbers of consumers to use the life and property saving 911/E911 access capabilities especially in cases of inclement weather that cause prolonged interruptions of commercial power supplies.
In cases of prolonged commercial electric power interruptions, fixed residential wireline voice over IP (VoIP) services such as the Verizon FiOS Digital Voice, or fixed residential wireline VoIP services that are provided through cable television (CATV) network providers, will fail after a certain period of time because the backup power supplied by the reserve battery packs at the premises of VoIP end-users will simply exhaust. Traditional residential voice telephony services supplied by a local exchange carrier telephone company (LEC) will continue to function as long as the LEC’s CO powers the directly connected wireline telephone customer premises equipment (CPE) sets at the end-user’s residence. In these circumstances, the CO acts as the centralized backup power battery and as long as the CO itself has electric power supplies and its landline network links with the end-user customer premises are not severed (e.g., by fallen trees or tree branches), basic residential voice telephone service will be maintained and E911 calls can be successfully made.

The provision of fixed wireline VoIP and broadband access services to residential end-user consumers depends on commercial electric power supplies from public electric utilities and on the distributed backup power supplies from the battery packs that are installed at the customer premises. Such individual backup power batteries can last up to eight (8) hours and thus successfully support VoIP E911 voice calls from a residential customer’s VoIP related wireline CPE if and when commercial power supplies fail. The Pa. PUC puts forth that the issue of whether the existing backup power supply duration from these batteries at the premises of a residential wireline fixed VoIP users in relation

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10 Wireline but portable CPE telephone sets at residential customer premises also fail in cases of prolonged commercial power outages. Wireless cellular phones or other wireless portable communication devices may also fail during prolonged commercial power outages if such phones and devices’ batteries are not able to be recharged.

11 LEC COs is equipped with standby electric backup power diesel-fired generators and they can also be connected to portable generators. The COs are also equipped with their own backup power battery banks that continue to be charged via rectifiers with direct current (DC) as long as electric power supplies are maintained via the public electric utility in question or the continuous operation of the COs permanent standby and/or portable generators.
to E911 connectivity and access is technically sufficient and legally acceptable at the current and customarily available levels to ensure the reliability and safety of citizens as prescribed in the NPRM. The Pa. PUC submits that the duration of commercial power outages in cases of extreme inclement weather can easily exceed eight (8) hours as it happened both during the June 2012 derecho storm in the District of Columbia – northern Virginia metropolitan region, and more recently during the October 2012 Hurricane Sandy in the Eastern Seaboard. Furthermore, the corresponding need for accessing E911 and successfully connecting with the appropriate PSAPs and the relevant emergency services substantially increases during abnormal circumstances, e.g., in cases of extreme inclement weather.

Through the Pa. PUC examination of a formal end-user consumer complaint and the relevant evidentiary record, the Pa PUC was able to ascertain that manual intervention is or may be required in order to take advantage of the full eight (8) hours of reserve backup power from the distributed battery packs that are associated with the provision of retail wireline residential VoIP services. 12 The Pa. PUC is generally aware that both telecommunications carriers and CATV providers of fixed wireline VoIP services are or may be experimenting with distributed backup power battery packs with increased output duration of more than eight (8) hours. However, the Pa. PUC continues to believe that the common standard of backup power output for eight (8) hours is still prevalent among the installed residential consumer base of these distributed battery packs. As the respective durations of regional commercial power outages during the June 2012 derecho and Hurricane Sandy demonstrated, the Pa. PUC questions whether the eight (8) hour standard is adequate to ensure the reliability and availability of 911 services for residential end-users, including the provision of retail broadband access services, during prolonged commercial power outages. In short, the Pa. PUC believes that even where adequate power supplies were maintained and/or timely restored to wireline network

nodes on a priority basis, these nodes could not be effectively used by residential end-user consumers for 911/E911 calls with distributed premises backup power battery packs that had simply exhausted.

The Pa. PUC further believes that there must be a comprehensive examination of whether the telecommunications carrier and CATV company wireline networks are technically capable and do conduct periodic remote telemetry testing of the distributed backup power battery packs that are installed at the premises of residential end-user consumers. The detection of potentially malfunctioning or underperforming battery packs is crucial if adequate levels of backup power are to be maintained during commercial power interruptions so that 911 services reliably work if an emergency occurs. These distributed and installed backup power battery packs are of various vintages, manufacture, and quality, and their respective performance guaranteed to be consistent with the currently used eight (8) hour commercial standard of backup power output. Furthermore, according to the Pa. PUC’s knowledge and belief, it appears that when such a distributed backup power battery pack fails, e.g., it does not properly recharge under normal operating conditions, the relevant responsibility for detecting the failure and the replacement cost of the battery pack shift to the residential end-user consumer.

The issue of distributed backup power battery packs that are installed at the premises of residential end-user consumers can impact a number of fixed wireless services that end-users are adopting to replace traditional landline telecommunications services. Such fixed wireless services and their associated customer premises equipment (CPE) inclusive of the fixed wireless connectivity device or base station, e.g., for AT&T’s wireless “Home Phone” service, may be totally dependent on the availability of commercial power supplies and may not be equipped with backup power battery packs. Although such fixed wireless services are sold with the necessary and self-exculpatory commercial warnings and advertising disclosures that 911/E911 access capabilities may
The Commonwealth of Pennsylvania, along with the FCC, has the universal obligation to protect the interests and public safety of citizens as well as the reliability and continuity of communications networks including broadband technologies. Consequently, Pennsylvania statutory requirements do not treat 911/E911 access and connectivity on a “best effort” basis, including 911/E911 calls that are made through retail broadband access VoIP services. Pennsylvania law is focused on providing the legal and technical certainty that 911/E911 calls will timely and reliably get through to the appropriate PSAP and the relevant emergency services. Thus, the presence of reliable and survivable distributed backup power battery packs that are installed at the premises of residential end-user consumers that utilize retail broadband access services and VoIP capabilities is both operationally essential and legally required. The same requirement and the relevant standards should also apply for backup power battery packs that would assist fixed wireless devices and services in cases of prolonged commercial power interruptions affecting residential end-user consumers.

The FCC should undertake the necessary steps to promulgate appropriate technical standards with the collaboration and input of interested stakeholders including the States and their state utility commissions. The formulation of an appropriate government — industry task force to that end would be a very desirable first step. The FCC should also place appropriate emphasis on consumer education regarding the availability and
operation of the distributed backup power battery packs that have been and are installed at the premises of residential end-users, and mandate the participation of telecommunications and communications services providers in such consumer education efforts.

The Pa. PUC thanks the FCC for the opportunity to file these Comments.

Respectfully Submitted On Behalf Of,
The Pennsylvania Public Utility Commission

[Signature]

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