

BEFORE THE
PUBLIC SERVICE COMMISSION OF MARYLAND

In the Matter of the	*	
Commission's Investigation Into	*	
The Outages of Verizon	*	Case No. 9265
Maryland Inc. 9-1-1 Network In	*	
Maryland	*	

RESPONSE OF VERIZON MARYLAND INC.
TO ORDER TO SHOW CAUSE

Verizon Maryland Inc. ("Verizon") understands the critical importance of providing reliable 9-1-1 services to 9-1-1 centers, also known as Public Safety Answering Points ("PSAPs"), and the community. It also recognizes the essential nature of communicating with the PSAPs during events that impact 9-1-1 service. As a result, Verizon has worked closely with PSAPs on 9-1-1 related issues, including new issues associated with focused overloads driven by wireless calls to 9-1-1 during extraordinary events. Verizon continues to work through improvements on communications with PSAPs, and plans to focus on more automated processes as the improvements evolve.

In light of Verizon's demonstrated commitment to work through these issues, Verizon respectfully submits that the proposed findings and remedies in the Commission's Show Cause Order are unnecessary and inappropriate. Verizon offers these written comments in advance of the hearing to recap the process improvements Verizon is implementing on 9-1-1 issues and to explain why the Commission should not find that Verizon violated PUC article § 5-303 or impose a civil penalty on Verizon.

I. Verizon has worked with PSAPs to implement a number of solutions based on lessons learned from the January 26 "focused overload."

As explained at the Commission's Administrative Meeting on March 2, 2011, Verizon learned a great deal from the focused overload resulting from wireless calls to 9-

1-1 during the heavy snowstorm in the Washington D.C. metropolitan area on January 26. These include the lesson that although Verizon has always worked to communicate with PSAPs on a timely basis, it needs to do a better job of communicating with PSAPs earlier in the process during 9-1-1 events, even if that means initiating communications before all the details are known. Verizon also obtained data regarding technical issues associated with the interaction during a focused overload between Verizon's switching equipment (9-1-1 selective routers) and a PSAP's private branch exchange ("PBX") equipment that the PSAP utilizes to route calls to its 911 operators. As Verizon explained to the Commission, both in oral testimony and through various documents, Verizon has implemented a number of improvements based on these lessons learned.¹

These improvements should help in 9-1-1 incidents going forward but Verizon is also testing new ways to automate notifications through electronic means to make the improvements better. Of course, as the Commission no doubt recognizes, ultimately, the number of 9-1-1 calls that can be completed during a focused overload depends in large part on the number of trunks and the number of 9-1-1 operators utilized by PSAPs.

Communications Improvements

Directly reacting to the January 26 storm, Verizon implemented a new communications process on February 18 to ensure that PSAPs are notified more quickly during a 9-1-1 incident.² These communication improvements will help not just in focused overloads, but other 911 incidents as well. These improvements were

¹ For various related technical documents, please see attached Affidavit of Maureen Davis.

² A number of the improvements are manual in nature, and Verizon continues to examine ways to automate processes to avoid human error.

communicated to the ENSB via letter dated February 17, which was subsequently distributed to all PSAPs, and were reviewed with the Commission on March 2.

The improvements focused on having Verizon contact PSAPs as soon as possible when particular situations arise that could affect 9-1-1 services. With these improvements, Verizon's self-imposed goal is to notify a PSAP, on average, within 15 minutes of particular 9-1-1 related events. These events are related to 911 trunks, 911-related alarming and the communications between Verizon's 9-1-1 selective routers and a PSAP's PBX:

9-1-1 Trunk Out-of-Service. Verizon's Network Operations Center ("NOC"), which monitors and operates Verizon's network, will trigger a process to alert PSAPs when it becomes aware that even a single 9-1-1 trunk is out of service if the trunk does not restore on the first try by the NOC associate, whether or not there is a focused overload event.³ Such notifications will be preliminary since Verizon may not yet have many details on the nature of the particular problem at hand. In such cases, Verizon plans to follow up with the PSAPs to update them once the investigation has been completed.

Communications Between Verizon's Selective Routers and PSAP PBX Equipment. As a result of testing that Verizon has done with its vendor in a lab, it recognizes that communication issues between Verizon 9-1-1 selective routers and a PSAP's PBX equipment (referred to as "wink failures," as described in more detail below) could indicate a focused overload or some other problem related to 9-1-1 facilities.

³ A single 9-1-1 trunk outage does not typically affect the ability of a 9-1-1 call to go through to a PSAP because a call will try another available 9-1-1 trunk if one is not available.

Accordingly, if the NOC receives alarms that indicate that a wink failure occurs more than five times in any five-minute period, and unless another cause is already indicated, Verizon will begin internal diagnostics for a possible focused overload event and any affected PSAP can be notified.

As Verizon continues to study the January 26 event, it is examining other potential communications improvements. For example, in reconciling detailed data with Montgomery County from the January 26 event, Verizon determined that another condition that should trigger communications with PSAPs is when a threshold number of 9-1-1 calls receive busy signals within a particular period of time. Verizon will add this triggering event to its communications improvement process. Verizon is also exploring other ways to automate communications processes (both internally, and with PSAPs) to expedite communications during 9-1-1 events.

As discussed at the March 2 hearing, as a first step, Verizon has implemented a new process in Maryland on March 17 so that PSAPs receive an email notification from the CCC when a 911 ticket is opened and closed. Verizon is now working to supplement the process to include status updates.

Technical Issues

As explained at the March 2 hearing, Verizon has proposed to PSAPs a technical remediation to address problems with the interaction during a focused overload between Verizon's 9-1-1 selective routers and a PSAP's PBX equipment that the PSAP utilizes to route calls to its 911 operators. Working with the recommendations of a vendor, Verizon

implemented a remediation solution that was detailed in communications to Maryland PSAPs. The communications included a “National Switching Technical Bulletin” dated February 28, as well as a letter to the Maryland Emergency Number Systems Board (“ENSB”) dated February 17, both of which were filed with the Commission. Verizon continues to examine other long term solutions, and on March 4, formally presented the issue to the National Emergency Number Association (“NENA”) for consideration.

Communications Between Verizon and PSAP Equipment During Focused Overloads

As Verizon has explained to the Commission at the March 2 hearing and through various documents, Verizon has concluded, based on lab testing with its switch vendor, that during focused overloads to PSAPs, “double wink failures” can cause the PSAP trunks that carry calls from wireless carriers to be removed from service during call setup. When a 9-1-1 selective router presents a new call to the PSAP over an idle trunk, the PSAP equipment (typically a PBX) is configured to respond with a signal to indicate that it is able to receive the calling party information (so that the PSAP can know the number from which the 9-1-1- call is coming). If the signal is received back from the PSAP equipment within the standard sub-second time frame, the call completes.

Wink failures occur when a selective router presents a new call to the PSAP over an idle trunk and the PSAP PBX does not respond with the signal to signify its ability to receive the calling party’s telephone number within the required time frame. Wink failures can occur for various reasons, including a focused overload or a trunk problem. If no signal is sent back to the 9-1-1 selective router within the maximum call setup time (measured in hundreds of milliseconds), the call is usually offered to the next available

trunk in a round-robin fashion. Since another trunk is likely to be available during normal operations, that trunk would respond with the required signal and the call would be completed on the alternative trunk.

But, if all the other trunks remain busy, as is often the case due to the high volume of calls during a focused overload, the same call will again be offered to the same trunk. If this second offering results in a second no-wink condition (i.e., a “double wink” failure), the 9-1-1 selective router will remove that trunk from service because it concludes that a call cannot be completed on that trunk, even though the trunk may still ultimately be able to process calls. When the trunk is taken out of service, an alarm will be presented in Verizon’s NOC, and a technician will investigate the cause of the trunk failure and attempt to restore it. With the removal of each trunk, there is a reduction of the call-handling capacity of the specific group of trunks serving the PSAP. If the focused overload event persists, all trunks within the affected trunk group could potentially be taken out of service.

Technical Remediation

To recap the remediation plan disseminated to the PSAPs after consultations with equipment manufacturers and examining the impact of focused overloads in Verizon’s test lab, Verizon recommends to PSAPs that a 9-1-1 selective router trunk group setting, known as the “automatic busy percentage” setting, be changed to allow only a single trunk in a group to be removed from service automatically due to wink failures. When a single trunk is out of service, it will signal a critical alarm in Verizon’s NOC, which will require a technician to test all the trunks to the PSAP to determine if they are working

properly.⁴ This testing will allow the technician to determine if the alarm is related to a focused overload in which case all trunks should remain in service. However, if the alarm is not related to a focused overload and the trunks fail diagnostic tests, the trunks will be taken out of service and calls will be rerouted, if possible. Of course, even with this remediation plan, a number of wireless 9-1-1 calls will still receive busy signals during a focused overload if there are more calls than available trunks connected to the PSAP. But the technical remediation is important because it allows 9-1-1 trunks that are able to carry calls to remain in service during a focused overload event.

II. Verizon's equipment, services and facilities are safe and reliable.

The statute cited in the Show Cause Order requires that a public service company “furnish equipment, services and facilities that are safe, adequate, just, reasonable, economical and efficient, considering the conservations of natural resources and the quality of the environment.” Public Utilities Article (“PUA”) § 5-303. Verizon’s equipment, services and facilities satisfy those requirements, and there are no facts before the Commission that could lead it to reasonably conclude that PUA § 5-303 was violated or that financial penalties against Verizon are warranted. The Show Cause Order does not, and could not, state that Verizon’s equipment or facilities are faulty; to the contrary, its equipment and facilities have allowed Verizon to discharge its network responsibilities pursuant to all required standards. If there were a claim of unsafe equipment or facilities,

⁴ This proposed change may delay activation of any automated reroute capability that might otherwise have been in place – it is for this reason that Verizon is working closely to ensure PSAPs understand and agree with these changes before they are implemented. Some Maryland PSAPs have agreed with this recommendation while others have not.

a much larger, more complicated assessment, involving expert testimony and a careful review of many factors, would be required.⁵

A. Verizon's network is safe.

Verizon's network statistics in Maryland during recent months show an incredibly reliable network: 99.999% availability in December, 99.997% in January, 99.999% in February, and 99.999% in March (through March 30).⁶ These statistics speak to Verizon's overall switching and transport network in Maryland, including the portions of the network that deliver 9-1-1 services to PSAPs. Nor do the four events cited in the Show Cause Order suggest that the network is unsafe.

As described above, the event of January 26 is not a reflection of Verizon's network, but rather a specific phenomenon associated with the interaction between Verizon and PSAP facilities during a focused overload of wireless calls to 9-1-1 centers. Verizon is acting as an industry leader to get out in front of such issues, and is working through 9-1-1 industry groups (as well as the Federal Communications Commission) to address technical issues associated with such events. Verizon's work in this regard reflects recognition of the importance of the issues surrounding 9-1-1 service and the necessity to work together with PSAPs to find solutions to potentially industry-wide problems. The Commission should encourage such work, and has before it no evidence that Verizon's facilities did not work as intended, nor that they were unsafe or inadequate.

⁵ These factors could include the type and nature of equipment utilized by PSAPs.

⁶ See attached Affidavit of James McLaughlin.

There also is no evidence before the Commission of unsafe or inadequate facilities regarding the other 3 dates cited in the Show Cause Order. The Commission cites July 25, 2010 as an “outage,” perhaps in reference to Montgomery County’s statements at the March 2 hearing that it believes that there likely was a focused overload event on July 25, 2010. Verizon has no record of a 9-1-1 ticket being opened up by Montgomery County related to that date.⁷ Because of the length of time that has passed since that event, Verizon’s switch data is now unavailable. If there was a focused overload situation on that date as Montgomery County believes, it would not be a reflection of Verizon’s network but rather a scenario similar to that presented on January 26, 2011.

The other two cited dates (December 17, 2010 and January 31, 2011) were isolated technical difficulties. Verizon determined that some (but not all) of the wireless trunks were out of service during these events, and described the isolated nature of those events in its response letter to Prince George’s County dated February 14 (a copy of which was filed with the Commission). As explained in that letter, Verizon worked quickly once it heard from Prince George’s County to restore service to the wireless trunks on those dates (and later replaced two T3 cards in the network that appeared to be the source of the problem). And during the time before trunks were restored to service, the system was designed to route calls to the PSAP’s administrative phone lines so that 9-1-1 wireless callers could still reach the PSAP. With such routing, the callers were able

⁷ The media coverage of the July 25 storm focused on the surge of 9-1-1 calls delivered to the Montgomery County PSAP. Dan Morse, “Desperate calls to Montgomery’s 911 met with busy signals; Storm victim’s friends tried to get help but non-emergency matters clogged system,” *Washington Post* (August 23, 2010) (“In the 60 minutes during and after the storm, the county’s 911 center received 391 calls; many were for non-emergency matter such as fallen trees. That was more than five times the number of calls in the preceding hour, and the flood of calls created the busy signals, officials said. ‘Every 911 center in the country has a finite number of incoming lines. More than 99 percent of the time, that does the job,’ Montgomery County Police Chief J. Thomas Manger said.”).

to reach the PSAP, but those facilities do not transmit the Automatic Location Identification (ALI) information. In other words, those calls to 9-1-1 successfully transmitted, but some callers had to tell the operators where they were located. In sum, the incidents on these two dates did not constitute unsafe or inadequate service or facilities. And the communications process improvements described above that Verizon is implementing should help facilitate quicker communications to PSAPs in any events similar to these in the future (because they would have triggered the updated communications process).

B. Verizon's communications improvements should be encouraged, not discouraged through financial penalties.

In its Show Cause Order, the Commission suggests that Verizon did not promptly notify the respective PSAPs on four dates that certain 9-1-1 trunks were out of service, and that such failure to notify itself could mean that Verizon's services were not safe, adequate, or efficient, in violation of §5-303. As described above, Verizon agrees wholeheartedly that communication with PSAPs during 9-1-1 events is critical, and continues to improve its processes for communicating with PSAPs. But the basis for the legal claim that Verizon violated §5-303 or could be penalized financially under PUA §13-201 or §13-202 is unclear at best.⁸

⁸ Verizon's regulated intrastate services (including its E911 Services) are specifically governed by tariffs filed with, and approved by, the Commission. See COMAR 20.45.05.01 ("Each utility shall provide telephone service to the public in its service area in accordance with its tariffs on file with the Commission."); Md. Code Ann., Pub. Util. Cos. § 4-202. Verizon's tariffs do not contain any requirement to notify the PSAPs under any particular E911 trunking degradation conditions. In fact, the tariff's only mention of communications is to require the PSAP to notify Verizon of any service failure (not vice versa), as follows:

It shall be the responsibility of the customer [*i.e.*, the PSAP] to inspect and monitor the Enhanced 911 facilities to discover errors, defects or malfunctions in the service. The customer shall make any operational tests that, in the judgment of the customer, are

Verizon has been forthright and open with the Commission about what happened in past 9-1-1 events and what it is doing going forward to make changes. At the March 2 Administrative Meeting it described what had happened and detailed planned improvements for the Commission. Such open and constructive engagement should be encouraged, not discouraged through imposition of penalties.

Indeed, one key factor considered under the cited penalty provisions is “good faith” efforts of the public service company “in attempting to achieve compliance after notification of the violation.” Md. Code Ann., Pub. Util. Cos. §§ 13-201(d)(4) & 13-202(d)(4). As stated above, Verizon does not agree that there has been any violation of a statute or Commission rule, and thus it was not – nor could it be – on notice of any such violation that could give rise to financial penalties. As detailed above and also before the Commission on March 2, Verizon has acted diligently and in good faith over the past two months (after learning from the mass call event experience), in conjunction with its PSAP partners, the state ENSB, and vendors, to develop and implement better technological solutions and internal processes, and, most critically for purposes of this proceeding, faster and more effective communications with the PSAPs during future similar events. Verizon continues to learn more about ways to improve as it implements process

required to determine whether the system is functioning properly for its use. *The Telephone Company shall be promptly notified in the event the system is not functioning properly.*

Verizon Tariff P.S.C.-Md.-No. 211 § B.1.i (emphasis added). Thus, there is no state law basis to penalize Verizon regarding communications with PSAPs, let alone any specific standards as to what types or magnitudes of E911 trunking degradations would trigger a duty for Verizon to notify the PSAP. A conclusion by the Commission that Verizon violated the general statute requiring safe and adequate equipment, services and facilities through a failure to promptly notify a PSAP would conflict with the specific standards of the governing tariff and would not stand as a legal matter. Indeed, to apply PUA §5-303 here to find that Verizon violated that statute’s requirement for “safe, adequate, just, reasonable, economical, and efficient” services also would likely violate Verizon’s due process rights, as the absence of any statutory or regulatory standard for notifying the PSAP means that Verizon did not have adequate notice as to what behavior would constitute a violation of its legal duties in this context.

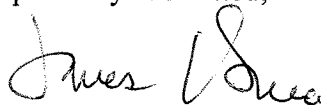
changes, including the need to find ways to better automate communications to avoid human error that occurs as new processes are learned and implemented.

Other factors include the “number of previous violations” of the statute, as well as “gravity of the current violation.” Md. Code Ann., Pub. Util. Cos. §§ 13-201(d)(1), (2) & 13-202(2)(3). Again, there is no violation of the cited statute, so these factors have no meaning here. To Verizon’s knowledge, it has never been found to have violated §5-303 regarding 9-1-1 facilities or communications with PSAPs over 9-1-1 matters.⁹ While Verizon agrees that issues related to 9-1-1 facilities and services are critical, its good faith work on such issues shows that there is nothing grave about its conduct that would support a financial penalty.

In light of Verizon’s robust good faith efforts to improve its communications with the PSAPs during E911 events, the Commission should not attempt to penalize Verizon under the cited statutory provisions.

Dated: April 4, 2011

Respectfully submitted,



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⁹ Verizon appeared before the Commission in October 2010 to review particular issues related to 9-1-1 that had arisen with Calvert, Charles and St. Mary’s counties, but it was never claimed that Verizon’s conduct in those cases constituted a violation of §5-303. And Verizon detailed specific improvements it made in response to those issues in a letter dated October 20, 2010, a copy of which was provided the Commission. Thus, the improvements explained here will build on those implemented last year (in response to specific concerns not at issue here).

CERTIFICATE OF SERVICE

I hereby certify that, on this 4th day of April, 2011, copies of the foregoing RESPONSE OF VERIZON MARYLAND INC. TO ORDER TO SHOW CAUSE were served upon the following persons at these addresses and via email:

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