

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)
)
Inquiry into Circumstances of Major 911) PS Docket No. 14-72
Outage Centered in Washington State)
On April 9-10, 2014)

REPLY COMMENTS OF INTRADO

Intrado Inc. and Intrado Communications Inc. (together, “Intrado”) respectfully submit the following reply comments in connection with the Public Notice released May 16, 2014 by the Federal Communications Commission (“FCC” or “Commission”) and related to the 911 outage occurring on April 9-10, 2014.¹

I. Introduction

Intrado’s very existence centers on advancing the science of emergency communications technology with the goal of saving lives, and the company’s track record demonstrates its commitment to achieving that mission and goal.² Intrado is also fully committed to the

¹ In re: Public Safety and Homeland Security Bureau Announces Inquiry into Circumstances of Major 911 Outage Centered in Washington State on April 9-10, 2014, PS Docket No. 14-72, Public Notice, DA 14-676, released May 16, 2014 (“Public Notice”).

² Formerly known as SCC Communications Corp., and including acquisitions made over time such as Lucent Public Safety Systems (part of Bell Labs which invented 911 in 1968), along with Positron and HBF, Intrado and its dedicated people can take credit for many of the significant innovations made in 911. Following are some of 911’s “firsts” that are attributable to Intrado: 1972, enhanced 911 (E911) system; 1983, commercial 911 customer premise equipment; 1989, fault-tolerant 911 database, geographically diverse ALI and selective routing database; 1995, satellite-based E911 data delivery system; 1995, coordinate-based E911 control system; 1995, integrated intelligent workstation; 1996, computer-based map viewing software; 1996, wireless E911; 1998, special coordinate-based E911 management system; 1999, automatic crash notification 911 solution; 1999, E911 based emergency telephone notification service; 1999, interconnection of voice and data between CAN/TM and E911; 2001, wireless Phase II call; 2004, VoIP 911 service; 2005, NextGen 911 call and service; 2006, IP enterprise 911 solution; 2008, 911 solution for converged networks; 2008, wireless peering solution; 2009, first text message to 911; 2012, NextGen911 voice call; first state (WA) to go live with NextGen911; 2012, LTE 911 deployment; 2013, successful completion of Phase II VoLTE call.

Commission's goal of reliable and resilient emergency communications networks, and it commends the Commission for its diligence and again offers its full cooperation.

Via NORS reporting, a far-reaching meeting with Commission staff, followed by responses to written questions, Intrado has provided the Commission with a detailed explanation of the outage. The root cause of the technical failure has been corrected; enhanced alarming with routine manual checks have been implemented; training and procedures have been enhanced to achieve more effective monitoring and problem detection; architectural reviews have found that no additional risks of the same nature exist in the system architecture; issues within Intrado's control have been addressed; cooperative improvements with partners are on-going; and additional architectural improvements have been made so any similar event would result in successful processing of calls between redundant components. Intrado now takes this opportunity to respond to filed comments, to discuss facts and issues that may not be evident in the record thus far, and to provide further insight into why the service disruption was the result of several factors contributing to the event, its duration, and the period of time taken to diagnose and report it.

II. The A911 System Configuration Is Reliable and Compliant.

Intrado recognizes the expressed opinion and concern that, "Intrado uses only one ESInet with only two Call Routers to provide 911 service to all states nationwide" and the suggestion that, at a minimum, each state should have its own ESInet with two call routers.³ Regarding the implication that this configuration isn't reliable, Intrado cautions against reliance on familiar

³ Comments filed by King County, Washington, numbered paragraph 7, page 2, letter from Marlys R. Davis to Ms. Marlene H. Dortch dated June 15, 2014.

(perhaps comfortable), legacy concepts to which advanced technology is no longer beholden.⁴

The deployment of additional routing facilities will come at a cost,⁵ but more importantly, even if agencies are willing to pay the cost, unnecessary facilities add complexity and risk to any system as do changes in technology until experience and maturity can be achieved over time. Individual systems should be evaluated and built by considering the needs of the public safety agencies that use the system.

The traditional, regional selective router model is outdated when compared to cloud-based models where call processing transactions can be spread across multiple processing instances that are redundant and geographically distributed. The cause of the outage was anomalous, and having more routers isn't necessarily the rational solution to the pre- or post-outage circumstance. It is no longer necessary to think in terms of regional processing when transactions can be spread across multiple processing components that are distributed and not tied to geographic boundaries. Higher levels of system availability can be achieved by distributing traffic across multiple processing components thus ensuring that all those components are not in the same geographic area. Suggestions that processing should be regionally localized is not the correct response, particularly when viewed in terms of the overall

⁴ Intrado agrees with TIA, relying on NSTAC findings, that “The transition from legacy technology to [IP] – based technology is, in fact, one of the most noteworthy fundamental improvements towards *increased resiliency due to the nature of IP*” (emphasis added).

⁵ The complexity, human resources and cost thereof, along with other facts involved in developing, deploying and maintaining an IP ESInet infrastructure exceed that of the legacy 9-1-1 Selective Router and ALI database infrastructure. The expertise and knowledge required is in high demand; thus, using such limited resources on an antiquated model of 700+ legacy Selective Routers and thousands of 9-1-1 Authorities across the United States, it makes sense to consider how those limited resources could meet the demands of NextGen 911 by incorporating fewer, rather than more, facilities.

benefit to cooperating 9-1-1 authorities that can create a geographically-distributed, resilient, feature-rich and highly available emergency response infrastructure.⁶

The Intrado A9-1-1 system is deployed across multiple states with an architecture that is redundant, geographically distributed to mitigate outages and failures, and has proven to be reliable and extensible. The architecture has successfully processed approximately 25 million calls over the past six (6) years, and the solution has proven reliable and resilient up to, and following, this outage. CenturyLink correctly points out that the circumstances of the June 2012 Derecho storm paint the outage in a more favorable light,⁷ but the more salient point is the fact that the Intrado A911 system deployed in the state of Vermont did not suffer any service disruption after withstanding equally-destructive levels of force during Hurricane Irene in August 2011.⁸ The root cause of the outage that is the subject of this investigation has been fully addressed, and Intrado's commitment to continuous improvement of technology and services to prevent any disruption in 9-1-1 emergency services is absolute.

No NextGen 911 best practices exist today that apply to Intrado's A911 configuration (including the PTM and its configuration) or that would have mitigated this outage had they been instituted. The development of NextGen 911 best practices is in its initial stages. Intrado believes that the process of developing NextGen 911 best practices should continue to drive the direction of industry expectations and regulation.

⁶ The benefits are not just technological or operational. The investment can be shared across many 9-1-1 serving areas to reduce overall costs. IP networks and MPLS service offerings lend themselves to shared environments and the introduction of modern computing infrastructure to replace the legacy selective router footprints. Legacy compatibility, requirements, market share, business models and technology advancement all play a role in shaping what is feasible as NextGen 911 deployments move forward.

⁷ Comments of CenturyLink, page 3.

⁸ See, Urgent Communications story found at: <http://urgentcomm.com/blog/next-gen-911-system-intrado-helps-vermont-weather-hurricane-irene>

III. Marrying Legacy With NextGen Elements Isn't 100% Predictable.

Years ago, and years ahead of its time, when Intrado was designing its Intelligent Emergency Network® for NextGen 911, engineers grappled with tens of thousands of considerations in order to bring forward a hundred years of Bell System innovation that needed to be married with the novel, wide-ranging, always-changing and open-ended benefits of IP technology. Intrado was an integral part of the development of Bell's 911 technology and along the way developed much of its own technology and participated in the valuable lessons learned by all. By necessity, NextGen 911 systems must interoperate with legacy elements and thus must introduce into the system certain legacy requirements for redundancy and compatibility.⁹ This creates additional complexity and risk. In fact, it was a feature of the Intrado architecture's legacy redundancy and compatibility where the root cause occurred, i.e., an issue involving the PSAP Trunk Manager (PTM) functionality - - a necessary function for facilitating interoperability between an ESInet and legacy CAMA trunking for call delivery to the PSAP. When developing any new technology, every single possible contingency cannot be identified or tested in advance of deployment. And, to try to do so before deploying new technology would frustrate the Commission's goals and the purpose of 911 innovation - - "better protection of lives and property."¹⁰ This is particularly true when marrying next generation technology with legacy technology for the first time. Despite the legacy knowledge from those lessons learned, issues will occur and not all contingencies can be known or addressed in advance. Intrado agrees with TIA and urges the Commission "...to recognize that these occurrences are unique and, for

⁹ See, e.g., NENA discussion of requirement for NG911 to include functions of today's E911 system, *Baseline Next Generation 9-1-1 Description* (February 22, 2011), available at <http://www.nena.org/ng911>

¹⁰ Connecting America: The National Broadband Plan (NBP), March 16, 2010, available at <http://www.broadband.gov/plan/>

network providers and equipment vendors that design and plan for reliability, *impossible to completely avoid*” (emphasis added).¹¹ This principle is not limited to the performance of core elements such as the PTM. It includes accompanying aspects and service support features for newly-developed systems such as system monitoring. Like core components, time and experience are required for improving these system support features. Such was the case with setting thresholds and monitoring the PTM. Well-understood legacy elements that exist in a pure legacy environment do not behave the same way as they do in a hybrid environment, and it is unrealistic to expect perfection when dealing with those unpredictable behaviors. Nonetheless, Intrado and many others in this industry, strive for perfection, because the stakes are as high as they get.

IV. Other Factors Contributed to the Impact of the Outage, Its Duration and Intrado’s Level of Responsibility.

The lack of ingress trunk diversity across Legacy Network Gateways (LNGs) and lack of distribution to core processing sites contributed to the outage. For any geographic area, originating service providers (OSPs) are in the best position to understand their serving area and to make determinations of where calls are delivered in order to achieve diversity. The nature of legacy TDM¹² circuits that ingress to an ESInet requires cooperation and shared responsibility between the OSP and the ESInet provider in order to achieve architectural redundancy and mitigate the impact to any one geographic area (and the 9-1-1 callers within that area).

Another contributing factor: as stated by CenturyLink in its recent comments, “... on April 10, 2014, CenturyLink experienced a *separate 911 outage* that affected approximately 16,000 people in 3 Oregon counties for 3 hours and 26 minutes due to a maintenance issue

¹¹ Comments of Telecommunications Industry Association, p. 5.

¹² Time division multiplexing used in legacy transport and circuit switching.

unrelated to the third-party [Intrado] equipment issue discussed throughout the majority of this filing” (emphasis added).¹³ This separate outage occurred in the early hours of April 10, 2014 and ran, for a significant period of time, concurrent with the outage centered in Washington. Particularly in the early minutes and hours of an outage, simultaneous events can cause confusion during diagnosis and did so in this case. Intrado spent precious time investigating reports that the CenturyLink outage was or might be related to the outage, causing technicians to reach invalid conclusions until finally eliminating the CenturyLink 911 outage as a cause or partial cause. This contributed to the delay in diagnosing the real issue underlying the outage and thus increased the duration of the outage. There was also inconsistent communication between Intrado and the PSAP community which contributed to confusion and failure to incorporate critical information into Intrado’s diagnosis.

[REDACTED]

[REDACTED] Commenting Washington agencies - - King County, Spokane County and Pacific County Sheriff’s Office - - expressed dissatisfaction with having to sit on hold waiting for a

¹³ See, CL Comments, page 2, footnote 3.

status, and Intrado agrees with their view that communication among parties needs improvement. Intrado stands ready to work with PSAPs, CenturyLink and others to accommodate that viewpoint.

Relative to the issue raised about Intrado allegedly failing to make available a list of all telephone numbers (TNs) dialing 911 during the time of the incident: Intrado did provide a list of all wireline TNs to CenturyLink for forwarding to PSAPs along with a listing of ESRKs/ESQs. Intrado's Wireline Unit, acting on behalf of its customer CenturyLink and as a provider of 911 services to CenturyLink, does not have access to the full calling party number for wireless and VoIP subscribers. To provide these TNs would require Intrado's Wireline Unit to obtain this information from Intrado's Mobility Business Unit (representing wireless and VoIP providers) as well as other providers like TCS or those carriers handling these services in-house.

[REDACTED]

[REDACTED] Intrado's business units are under contract to varying service providers and government agencies, and those contracts are strictly honored. Under the current circumstances, it would be improper for Intrado to "cross the lines" established by its customers relative to information considered by them to be confidential in order for Intrado to "glue together" a more complete picture of an outage for other parties, including, as the case may be, PSAPs or the Commission. Intrado acknowledges and understands that this circumstance may be viewed by some as less than ideal, and Intrado is willing to engage in a discussion of the issue. The larger Intrado enterprise may have in its possession (on behalf of its various customers) a wide range of information that might relate to a 911 outage (with its use strictly controlled by contract), and this arrangement should not be usurped or translated to an

expectation or requirement that the larger Intrado enterprise must breach some of its customer contracts in order to disseminate that information in a collective, assimilated fashion.

V. Criticism and Accountability Should Be Fair and Include Policy Considerations.

While not diminishing in any way the significance of the service disruption or Intrado's responsibility for making corrections and ensuring against another occurrence, it should not be completely unexpected when service disruptions occur in a new and advanced technological environment. It is not reasonable to expect perfection in any highly complex system. Likewise, it is not reasonable to expect the monitoring of a highly complex system to be perfect. Improvements come with time and experience - - along with a commitment to improve which Intrado has and will continue to demonstrate. The new experiences encountered during the outage caused Intrado to take hours to diagnose the problem, but Intrado reported it as soon as it could confirm what the problem was.

As a technology leader, Intrado acknowledges that there are inherent risks of unpredictable and undesired outages. It's not a matter of if but when, and the risks include the accompanying criticism and accountability for when outages occur. When they do, leaders should be able and willing to withstand criticism and held accountable. Intrado is not hiding from this and only suggests that the criticism and accountability should be fair. Absent that, the potential for leaders to take a step backward - by taking fewer innovative risks - is high. Federal communications policy favors and places a premium on technological innovations that improve the lives of Americans as reflected in the Commission's recommendation to Congress to "...encourage innovation in the development and deployment of Next Generation 911 (NG 911) network ..."¹⁴ This policy goal would be dramatically frustrated if U.S. citizens had to wait for

¹⁴ NBP, Chapter 16, page 314.

the benefits of innovation until technology could be deployed without a flaw or the possibility of a flaw.

VI. Conclusion.

There is no other company on the planet more determined than Intrado to save lives through innovation. Intrado urges the Commission to carefully balance its interest in ensuring 911 reliability with its policy goal of promoting innovation - - exactly the kind of innovation at issue here. When the Commission concludes its investigation, it will be sending a message to the emergency communications industry, and Intrado believes that message should be sensitive to the chilling effect that unfair punitive measures could have on future innovation and cutting-edge deployments that save American lives and property.

Respectfully submitted,

INTRADO INC. and INTRADO COMMUNICATIONS INC.

June 30, 2014

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