Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matters of	)	
	)	
Wireless E911 Location Accuracy Requirements	)	PS Docket No. 07-114
	)	
Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems	)	CC Docket No. 94-102
	)	
Association of Public-Safety Communications Officials-International, Inc. Request for Declaratory Ruling	)	
	)	
911 Requirements for IP-Enabled Service Providers	)	WC Docket No. 05-196

COMMENTS OF NENA

The National Emergency Number Association ("NENA") hereby responds to the questions raised in Section III.B of the Notice of Proposed Rulemaking ("NPRM") in the captioned proceeding.[1] Our answers are grouped according to the NPRM paragraph in which the questions were posed.

8, 13. Timing and benchmarking of compliance

Time for compliance will vary with several factors, including the capabilities of the existing system and the topography and terrain of the individual PSAP jurisdiction or group of

[1] FCC 07-108, released June 1, 2007, 72 Fed Reg 33948, June 20, 2007. NENA responded to the Section III.A questions on July 5, 2007.

PSAPs.[2] The questions here imply the retention of "current accuracy requirements," but if these are changed, as ¶10 of the NPRM suggests, time for compliance may also need to change. Whether the interval prior to enforcement of PSAP-level measurements is referred to as a "stay" or a "deferral," the important point is to build the timelines into the regulations for the information of both carriers and PSAPs.

It would be useful for carriers and PSAPs alike to know where the current requirements are being met at anything resembling PSAP level. This would allow us to focus on deficient areas. The initial Comments of King County, Washington suggest a general inability of carriers – with the exception of a single A-GPS provider – to meet the current requirements at the county level. But there is no extended discussion there of technology and topology constraints. The Final Report of Focus Group IA of the National Reliability and Interoperability Council VII ("NRIC VII") recommends topological modeling by a public safety/industry body, ATIS/ESIF.[3]

Time for this initial baselining of PSAP areas would need to be built into the schedule. This is not to suggest that compliance testing in every PSAP jurisdiction

---

[2] The July 5th Comments of Verizon Wireless discuss a number of "adverse factors" and "topology types" inhibiting assisted GPS ("A-GPS") signal propagation, pages 17-20. *See also*, Final Report of "Project Locate," April 2007, http://www.locatemodelcities.org/documents/LOCATE_Final_Report.pdf

[3] http://www.nric.org/meetings/docs/meeting_20051216/FG%201A_Dec%2005_Final%20Report.pdf, at 23. It is our understanding that ATIS/ESIF has made progress in addressing these and other issues that were referred by the NRIC VII Focus Group IA. It is our hope that an update on such progress will be placed on the record by ATIS/ESIF in response to this NPRM.

is needed on Day One to determine current capabilities. Performance data should already exist in the hands of the wireless carriers, location technology vendors and mobile position center (MPC) providers. This data should enable the Commission to establish a general baseline of carrier capabilities. Benchmarks in paths to compliance were used with mixed success in the effort to implement wireless emergency call location Phase II,[4] and they continue to have value. They might need to be based on some composite of system readiness and topography/terrain.

In general, NENA believes that current or improved accuracy requirements should be measured over the smallest area for which compliance is technically feasible, and that substantial compliance nationwide should be achieved as soon as technically feasible. We hope to become better educated by the answers provided in this proceeding, but at this point the answers to timing and benchmarking cannot be given with precision. We therefore intend to continue to work with APCO and others to bring together all parties involved from industry and public safety to establish an ongoing forum to discuss current and future issues related to location accuracy and reiterate our call for the Commission to establish a forum to assist the Commission in providing recommendations moving forward on how to best optimize location accuracy capabilities. (NENA Comments of July 5, 2007, 4)

10. Single location accuracy requirement

For a brief time during the early years of 9-1-1 wireless call location, there was a single standard. In 1996, Section 20.18(e) of the FCC's Rules read:

---

[4] Section 20.18(d)-(f), 47 C.F.R.§20.18(d)-(f).

(e) As of [five years after the effective date of this rule], licensees subject to this section must provide to the designated Public Service Answering Point the location of a 911 call by longitude and latitude within a radius of 125 meters using root mean square techniques.[5]

The regulation at that time assumed a network-based triangulation of signals from at least three antennas to effect the caller's location. The emergence of satellite-based GPS solutions deploying intelligent handsets led to the present bifurcated requirement.[6] Each of the two requirements has shifted over time or its dates of implementation have changed. The root mean square language of the original unitary requirement was found too confusing and was modified to the present network solution standard: 67% of calls located within 100 meters, 95% within 300 meters.

While NENA supports a unitary standard for all truly wireless calling,[7] we would rather have a workable bifurcated standard than an unworkable single requirement. In many if not most cases, the difference between a location error radius of 100 meters and a radius of 50 meters is not as significant as the "uncertainty" data that many carriers now are passing to PSAPs with 9-1-1 calls and which we believe should be part of the FCC's regulations, as discussed further below.

---

[5] Report and Order, FCC 96-264, released July 26, 1996, Appendix C-2.

[6] Third Report and Order, FCC 99-245, released October 6, 1999, Appendix B.

[7] We distinguish wireless from "nomadic" VOIP calls which can be moved from one fixed location to another fixed location and are more like wire calls. We discuss this further below.

Additionally, while it may seem logical that the location requirements for a traditional CMRS wireless provider should be the same for providers of wireless IP service (e.g. Wi-Fi or Wi-Max) this is not necessarily the case. It is altogether possible that 9-1-1 calls made over IP-based wireless services can be more accurately located than traditional CMRS wireless service. Cisco's recent comments in Dockets 04-36 and 05-196 are informative in this regard:

> Indeed, since Wi-Fi uses the same frequencies and power limits as cordless telephones, virtually all end users will be no farther from a wireless access point than cordless phone users are from their wired PSTN base station. Thus, if the Wi-Fi based device transmits to the service provider the location of the wireless access point, in virtually all applications it will provide public safety personnel the same degree of accuracy that the PSTN system currently provides.[8]

The same solution may not be possible in a Wi-Max environment where base station locations may be insufficiently proximate to effectively locate end users. Thus, as we move to a wireless IP environment, there may not be a uniform solution for "wireless" location accuracy. All solutions should be carefully examined so that location accuracy requirements ensure that the best possible data, based on the type of calling technology being employed, is provided to the PSAP.

11. Improving location accuracy/hybrid solutions

A-GPS represents an improvement on straight GPS and could be called a hybrid solution. However, it is not written into any Commission rule. So far as NENA is aware, the idea of shortening time to first fix of a satellite by augmenting the terrestrial network was implemented by carriers and their vendors as a means

---

[8] August 15, 2007, at 9.

of meeting more reliably the current accuracy requirements. Generally, we prefer the setting of a feasible goal while leaving the means of achieving the goal up to the performing wireless carrier.

It may be that some hybrid of technologies becomes so obvious an improvement that it begins to prevail in the market over singular solutions or other hybrids. This could be happening now in the competition between network and A-GPS technologies. Incorporation of a technology into a regulation at the time it achieves dominance would be more prudent, we think, than trying to "pick a winner" prematurely.

Paragraph 11 asks "what has been the experience of PSAPs that receive Phase II service." King County has answered on this record, and Project Locate offers useful information in its Final Report. We hope many other commenters will add to the record, not just by anecdote but by systematic documentation. If that information is not available, it will need to be gathered for the outcome of this proceeding to be soundly based.

But again, we have found PSAP telecommunicators to be ingenious and persistent in working with margins of location error, so long as they have some decent idea of what those margins are. We will comment further on this topic of uncertainty in the next section.

12, 16. Accuracy standards, accuracy data.

Because we believe it premature to propose different standards until we know more about the chances for carrier compliance with the current requirements

in the real world,[9] NENA prefers to talk about data other than accuracy, per se, which many wireless providers now are passing to PSAPs to an extent that warrants inclusion in regulations. We focus here on "uncertainty."

We understand this to mean, in lay terms,[10] how sure we are that a caller's true location is within a certain distance of where the data passed to the PSAP positions the caller. The concept is often expressed as "confidence/uncertainty," to wit: 90% confidence that a caller's true location varies by 50 meters or less from his reported position. NENA has found that use of the percentage is not all that helpful and often confusing to PSAP telecommunicators.

We suggest that uncertainty be expressed simply in error distances (meters). A feasible confidence percentage could be chosen – perhaps 75%, perhaps 90% -- but not included in the data transmission. Rather, as a matter of practice, it would be understood that the error estimate is made with that chosen level of confidence. In the future, perhaps as a function of Next Generation 9-1-1,[11] it may be possible to standardize on a pictorial or graphic representation of uncertainty that would improve on the expression of error distances. For now, uncertainty in meters

---

[9] To judge from the King County results (Comments, 4-5), the margin of error can vary so widely on a few calls – one error of six miles was mentioned – as to make the requirement for maximum error of 100 meters (handset) or 300 meters (network) a fiction. It may be that expecting radio signals to meet anyone's expectations 95% of the time is too stern a task.

[10] A more expert discussion is found in the NRIC VII Focus Group IA Final Report (note 3, *supra*) at pages 5-6 and 28-29.

[11] http://www.nena.org/pages/ContentList.asp?CTID=65

should be a part of the new requirement for accuracy information presented to the PSAP. The calculation and formatting should be consistent and uniform.

This recommendation points to an important fact that should not be lost in this discussion. Above all else, the results of this proceeding must be developed with an eye toward improving the information provided to individual PSAP telecommunicators on a per call basis so that the telecommunicator can most effectively assist each individual 9-1-1 caller. Ideally, in the future we will be able to move to a per-call accuracy requirement rather than averages. It is our hope that challenging carriers to meet stringent accuracy requirements on average will result in better information provided on individual calls.

Providing uncertainty data with every call will assist call-takers in determining the appropriate resources to dispatch. Presenting understandable results of carrier maintenance and compliance testing, including topographically specific information, will assist PSAP administrators and telecommunicators with performance expectations which will be useful on a per call basis. When technically feasible, knowing the elevation of a call, and sufficiently understanding how to interpret such information, will likely also be useful on a per call basis.

14, 15. Testing

The NRIC VII Focus Group 1A Final Report discussed these questions in some detail, and we incorporate that report into these Comments by reference – not because we agree with it in every respect but because the work done there should not be lost. The discussion included maintenance as well as compliance testing. In

general, tests should reflect a real-world environment and should be conducted with equipment used by ordinary customers and include sufficient indoor tests to mirror approximate percentages of calls made indoors.

Since the Commission has asked OET (FNPRM, ¶19) to specially evaluate in-building location and the use of "hybrid" technologies, it makes sense to consider overhauling OET Bulletin 71 generally. NENA is dubious, however, about making its procedures mandatory rather than advisory when there seem to be potentials for carriers and PSAPs to agree upon measurement methods that vary from the book without diluting the accuracy requirement.

This is not to say that there should be no mandates for testing, only that these can be incorporated succinctly into regulations while allowing the Bulletin to elaborate in an advisory fashion. NENA strongly supports the carriers' willingness, as expressed in the NRIC 1A negotiations and Final Report, to share test data with PSAPs and public safety administrations. While we can appreciate the carriers' reasons for not wanting the data publicly disclosed, except in the aggregate, that wish could run afoul of state or local freedom of information laws. The best incentive for improved location accuracy performance could be public disclosure. Agreement must be reached on the presentation of such data so that it is meaningful and can actually be understood by PSAP personnel.

In addition to a periodic component to the test schedule – every six months (King County practice) two years (APCO recommendation), etc. – the FCC should consider a requirement to test after major system modifications or significant

changes in the "built environment."[12] There might even be changes in the natural environment that would prompt new tests. With regard to the latter, it is common to distinguish winter tests from measurements in leaf season. Related to the above discussion on improving location accuracy on a per call basis, NENA believes that the following comment from the State of Washington Enhanced 9-1-1 Program has merit:

> The efforts at implementing a significant ongoing program of regular testing and compliance review would be better aimed at setting clear goals that encourage research and development into and actual implementation of technologies that will permit a per call reporting that results in information that is truly useful in performing the objective of dispatching assistance to the caller.[13]

17. Calls placed when roaming

Without having yet read it carefully, NENA finds nothing in the Commission's recent order establishing automatic roaming as a common carrier obligation for commercial mobile radio services that speaks to the consequences for 9-1-1 calls by roaming customers.[14] The order summarizes its conclusion in the first paragraph:

> [A]utomatic roaming is a common carrier obligation for commercial mobile radio service (CMRS) carriers, requiring them to provide roaming services to other carriers upon reasonable request and on a just, reasonable, and non-discriminatory basis . . .(footnote omitted)

---

[12] Alternatively, the FCC should consider allowing a process where PSAPs and carriers determine when they need to do compliance testing. Certain factors could trigger the need for such tests, to be performed at the request of PSAPs who feel a carrier is underperforming. Necessary predicates would be the maintenance testing and network optimization process recommended by NRIC 1A.

[13] June 22, 2007, 14.

[14] Report and Order, FCC 07-143, released August 16, 2007.

This reads as an obligation one carrier owes another. It speaks to one of the NPRM's questions by reducing the chance that "no roaming agreement between carriers using compatible
technologies" would be a cause for failure of a roamer's call to 9-1-1. The implication is that when technologies are compatible, the absence of a roaming agreement would not excuse any failure of the host carrier to complete the visiting user's emergency call.

As a general matter, NENA believes the obligation to deliver 9-1-1 calls should be met for roamers as well has native subscribers, no matter what the differences in the technologies. We look forward to learning more about the impediments to delivering roamers' emergency communications in a time when, for example, the analog service common platform is disappearing.

18. Interconnected VoIP services

NENA accepts the NPRM's invitation to "update the record in the VOIP 911 proceeding" and will be providing, separately from these comments, detailed information about the work of its VOIP Location Work Group for the record of Docket 05-196. We cannot agree, at this time, with the FCC's tentative conclusion that, for example, nomadic VOIP service "must employ an automatic location technology that meets the same accuracy standards" applicable to CMRS services. We believe that shoots too low for an IP service that is fixed when in use, and fails to account for NENA's long-standing request for clarification of the role of the

Master Street Address Guide ("MSAG") in providing essential definition and uniformity to nomadic caller location.[15]

Respectfully submitted,

NENA

By_____

James R. Hobson
Miller & Van Eaton, PLLC
1155 Connecticut Avenue, N.W.
Suite 1000
Washington, D.C. 20036-4320
(202) 785-0600

August 20, 2007

ITS ATTORNEY

[15] National Emergency Number Association and Voice on the Net (VON) Coalition, Joint Petition for Clarification, July 29, 2005, 5.