

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

CC Docket No. 94-102

In the Matter of

Revision of the Commission's rules RM-8143
to ensure compatibility with enhanced
911 emergency calling systems

NOTICE OF PROPOSED RULE MAKING

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By the Commission:

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I. INTRODUCTION

1. In this proceeding, the Commission proposes to amend its regulations to address issues raised by the provision of 911 and enhanced 911 services through certain telecommunications technologies. The primary objective of this proceeding is to ensure broad availability of 911 and enhanced 911 services to users of the public switched telephone network (PSTN) whose health and safety may depend on 911 emergency services systems. Toward this end, we intend to ensure that the effective operation of 911 services is not compromised by new developments in telecommunications. First, we address a petition filed by the Adcomm Engineering Company ("Adcomm") to amend Part 68 of the rules by proposing technical performance requirements that ensure the compatibility of private branch exchanges (PBXs) with enhanced 911 emergency services.¹ In this *Notice of Proposed Rulemaking*, we seek comment on proposals for ensuring the compatibility of private branch exchanges (PBXs) and other dispersed private telephone systems with enhanced 911 emergency services.

¹ Comments were filed by Associated Public-Safety Communications Officers, Inc. (APCO), Bell Atlantic, BellSouth, GTE, South Carolina Budget and Control Board, and the Telecom-

munications Industry Association (TIA), and reply comments were filed by Adcomm and the North American Telecommunications Association (NATA).

2. Second, we propose to adopt rules that would require wireless services, in particular commercial mobile radio services (CMRS)² that provide real time voice services, to include features that will make enhanced 911 services available to mobile radio callers. These features include Station Number Identification (SNI), Automatic Location Information (ALI), Selective Routing (SR), and other features for 911 calls provided over wireless mobile units. This action responds to a Petition for Reconsideration filed by the Texas Advisory Commission on State Emergency Communications (TX-ACSEC) under the Office of the Attorney General for the state of Texas.³ It also responds to the issues raised in the Emergency Access Position Paper filed recently by the Associated Public Safety Communications Officials-International, Inc. (APCO), the National Emergency Number Association (NENA), the National Association of State Nine One One Administrators (NASNA), and the Personal Communications Industry Association (PCIA).⁴

II. BACKGROUND

3. Since AT&T's announcement in 1965 that the digits 9-1-1 would be made available nationally as an emergency telephone number, the use of 911 for emergency purposes has become widespread. The Commission's Network Reliability Council, in performing a special study of the reliability of 911 services, found that "the American public depends on 911 services in its emergencies."⁵ The Council found that 89 percent of the wireline access lines in the United States are served by some form of 911 service and that the service is increasingly engineered to provide a high level of reliability.⁶ Currently, about 260,000 calls nationwide are placed to 911 every day.

4. 911 emergency services enable telephone users to receive, and state and local governments to provide, fast response to emergency situations. The ability to dial 911 offers several advantages to users. First, it is a single, nationally used three-digit number that is easy to remember and dial in emergency situations. This provides callers, including children, with easy access to emergency services in areas where the telephone number for the various emergency service providers is not readily known. Second, because 911 calls are sent to Public Safety Answering Points

(PSAPs) over dedicated telephone lines, these calls are recognized and answered as emergency calls by professionals trained to assist callers in need of emergency assistance. Third, the use of 911 shortens the response time to requests for assistance because PSAP professionals have ready access to police, fire, and health emergency response service providers.

5. There are different levels of 911 services available, depending on the location. Basic 911 service is a forwarding arrangement in which calls dialed to the 911 telephone number are translated at a telephone company switch and are transmitted to a public safety agency for response. Most emergency systems, however, have enhanced this service.

6. Enhanced 911 systems help emergency services personnel achieve the shortest possible emergency response time by using Automatic Number Identification (ANI)⁷ to route an emergency call to the PSAP nearest the caller's location. At a minimum, enhanced 911 service provides the PSAP with the ANI of the calling party, permitting the PSAP to call back in the event the call is disconnected. A fully enhanced 911 system not only displays the ANI, but also permits an attendant at the PSAP to identify the calling party's address through the use of an external Automatic Location Identification (ALI) database. The ALI feature also permits selective routing (SR) of the call to the appropriate PSAP for the identified location and displays the public safety agencies (fire, police and emergency medical services) covering that location on the PSAP terminal.⁸ A fully enhanced 911 system may also provide the PSAP with other information, including the name of the subscriber, city, zip code, telephone number, date, time of day, and the class of telephone service (business, residential, etc.).⁹ Approximately 85% of 911 services include some form of enhanced 911 service.

7. Congress created the Federal Communications Commission "for the purpose [among others] of promoting safety of life and property through the use of wire and radio communication"¹⁰ This Commission has jurisdiction to license the electromagnetic spectrum, and also to regulate "instrumentalities, facilities [and] apparatus" through which wire and radio services are provided.¹¹ It is difficult to identify a nationwide wire or radio communication service more immediately associated with promoting safety of life and property than 911. We believe that broad

² CMRS is defined as "any mobile service... that is provided for profit and makes interconnected service available (A) to the public or (B) to such classes of eligible users as to be effectively available to a substantial portion of the public...." The term "interconnected service" means "service that is interconnected with the public switched network...." Omnibus Budget Reconciliation Act of 1993, Pub.L. No. 103-66, Title VI, §§6002(b)(3)(B), 107 Stat 312, 392(1992).

³ The Petition for Reconsideration was filed in response to Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, September 23, 1993, 8 FCC Rcd 7700 (1993)(*Second Report and Order*). Because this inquiry is broader than the proposals made in the TX-ACSEC petition, we are initiating this separate proceeding.

⁴ This paper was filed on July 5, 1994, as an *ex parte* comment to GEN Docket No. 90-314. It is attached at Appendix D.

⁵ *Network Reliability: A Report to the Nation*, National Engineering Consortium, June, 1993 at Section F, page 1.

⁶ Wireline carriers and 911 service providers may employ diverse routing of interoffice facilities, multiple 911 tandem switch architectures, alternate public safety answering positions

(PSAPs), special marking of 911 equipment, back-up power sources for PSAP facilities and diverse links for automatic line identification database access to ensure 911 service is reliable.

⁷ The use of the term "automatic number identification" or "ANI" in this NPRM is not intended as a reference to billing number presentation provided as part of Feature Group B or D local exchange services. Although the number presented to a PSAP on a wireline call is often derived from Feature Group B or D services, the number presented to a PSAP on a wireless call may be generated by several other means. Thus, the term ANI merely identifies a number associated with the caller and used to reference the caller's location. The term does not reflect a specific service or technology.

⁸ Selective routing is not needed in all areas. This feature is useful when telephone exchange boundaries extend into two or more PSAP jurisdictions.

⁹ A list of the 911 call features currently available to many emergency call taking organizations, listed in order of importance as defined by NENA/APCO leadership, is shown in Appendix B.

¹⁰ 47 U.S.C. §151.

¹¹ 47 U.S.C. §151, §153(a), (b), Titles II and III.

availability of 911 and enhanced 911 services will best promote "safety of life and property through the use of wire and radio communication."

8. *Private Branch Exchange and Dispersed Private Telephone Systems.* Private Branch Exchange (PBX) and other dispersed private telephone systems may present location identification problems for emergency services personnel. PBX systems route calls between telephone stations in an organization and connect those stations to the public switched telephone network through trunk lines. A single PBX may serve a number of different buildings. When a caller dials 9-1-1 from a station served by a PBX, a PSAP attendant may be able to retrieve the street address of a main building (the billing address associated with the ANI). Determining the precise location of the caller within a large building or at a station within a PBX that serves more than one building, however, may be complicated and time-consuming in a situation where time is critical.¹² While it is technically feasible to include location identification information in transmitting calls from stations served by PBX or other dispersed private telephone systems, there currently is no uniform means for ensuring that this information reaches emergency services personnel. Moreover, telephone users may or may not be aware that their telephone service is provided through PBX systems, and, in any event, are unlikely to be aware of 911 capabilities or limitations of the PBX systems. Yet, the ability of 911 service providers to deliver life saving services to them may depend on PBX compatibility with enhanced 911 systems.

9. *Enhanced 911 and Wireless Systems.* While some wireless systems are capable of providing basic 911 service, few, if any, are currently capable of providing an enhanced 911 service. This raises public policy concerns because the number of calls to 911 from wireless users, such as cellular telephone customers, is increasing rapidly. More than 13,000 new cellular telephones are installed daily in the United States.¹³ In major metropolitan areas, it is estimated that as many as 10% of the 911 calls originate from mobile radio service subscribers.¹⁴ For example, in January 1993, one California Highway Patrol communication facility fielded 80,000 calls for emergency assistance, 25,076 of

which were from cellular telephones.¹⁵ In 1987, the Massachusetts state police received only about 300 cellular calls per month. By December 1992, that number had grown to more than 15,700.¹⁶ We expect growth in the use of mobile radio services to continue. It has been estimated that by 1998 there will be 32 million cellular customers and 2.6 million Personal Communications Networks customers.¹⁷

10. The continuing growth of mobile radio service customers will increase the number of 911 calls that are placed from mobile telephones. As currently configured, however, wireless 911 services are inferior to the wireline 911 services that telephone users have come to expect. Specifically, 911 calls originated by mobile radio users generally do not provide PSAP attendants with the caller's precise location. Because the callers may not know their location,¹⁸ the ability of emergency service personnel to respond is hindered.¹⁹

III. COMPATIBILITY OF PBX EQUIPMENT WITH 911 SYSTEMS

11. Several states and localities have passed regulations or ordinances for the purpose of requiring PBX equipment to be compatible with 911 systems.²⁰ The specific requirements, however, vary significantly from one state to another. While several types of equipment and services may be available to ensure accurate routing of 911 calls from PBX or other dispersed private telephone systems, a lack of uniformity in this equipment may impair public emergency services by delivering inaccurate, incomplete, or misleading call origination information to the public switched telephone network. Moreover, mutually incompatible systems for resolving this problem are likely to cause user confusion or higher costs in equipment or services.

12. We propose to amend Part 68 our rules to ensure the compatibility of PBX equipment with enhanced 911 services. The record in this proceeding, discussed below, indicates that market forces to date have not been effective in implementing a solution to this problem. States and localities are considering separate and possibly conflicting regulations on PBX owners and equipment. Failure to address the problem quickly could result in increased costs as

¹² See Adcomm Petition at 3, citing a newspaper report of a fatality attributable partly to the misdirection of medical aid to a caller using a private phone system.

¹³ This figure is based on 1993 data, as published in *The Wireless Factbook*, Cellular Telecommunications Industry Association, Spring 1994, p. 6.

¹⁴ *Communications Daily*, "NARUC Notebook" (July 27, 1994) quoting Leah Senitte of the National Emergency Number Association.

¹⁵ This number for cellular telephone calls does not include calls from fixed cellular "Freeway Call Boxes." See, W. Clay Paxton, "Future Vision II: The 9-1-1 Imperative", NENA News, Vol. 12, No. 2, May 1994, at pp. 20-28. See also, George Raine, "Cellular Phone Owners Dialing 911 Frivolously", The San Francisco Examiner, February 25, 1993.

¹⁶ See W. Clay Paxton, *op. cit.* See also, Tony Rogers, "Cellular Samaritans Becoming the Eyes of the Highway Patrol", Associated Press, January 5, 1993.

¹⁷ *The Wireless Factbook*, Cellular Telecommunications Industry Association, Spring 1994 p. 36.

¹⁸ In Los Angeles County, 600,000 cellular/mobile 911 calls were placed in 1992. More than 25% of the callers could not

identify their location. This information was related by William E. Stanton, Executive Director of NENA, during a presentation at the FCC on March 23, 1994.

¹⁹ The following example illustrates the difficulties posed by the use of mobile radio services to reach 911 emergency services. At 2:50 AM on September 22, 1993, the Amtrak Sunset Limited derailed from the Bayou Canot Bridge in a remote area of the Mobile Delta. The mayday call from the train was received by the CSX Railroad office in Mobile which placed a call to 911, but incorrectly identified the location of the derailment as Bayou Sara, several miles south of the actual location. Consequently, dispatched rescue units were unable to find the derailed train. Subsequent to this action, a second call to 911 came in from an Amtrak employee on the derailed train using a cellular phone. The Amtrak employee was able to tell the 911 operator only that the derailment was somewhere on the Mobile River. While Mobile County has a modern enhanced 911 system, it was of no value with these calls. The first call displayed the address of the CSX station in downtown Mobile, and the second call from the derailed train displayed "mobile phone." See *NENA News*, "Mayday in the Mobile Delta." Dennis Stapleton, Vol. 12, No. 2, May 1994, at pp. 16-18.

²⁰ See, e.g., Mississippi Code 1972 Annotated, tit. 29, Chapter 5, §§ 19-5-303.

equipment that is not compatible with enhanced 911 systems becomes more widely distributed. Accordingly, we find that it is in the public interest to propose rules to require that PBX and other dispersed private telephone systems (hereinafter referred to collectively as "PBX equipment") operate effectively with enhanced 911 systems.

A. Adcomm and Industry Proposals

13. *Adcomm Petition.* The Adcomm petition seeks to prevent situations in which the provision of emergency services to a caller is delayed because the caller's location cannot be precisely determined when the caller dials 9-1-1 from a telephone served by PBX equipment.²¹ Adcomm proposes specific rules to ensure that telephone stations served by PBX equipment are compatible with public emergency access networks. Adcomm points out that the resolution of this problem will require accurate management of telephone number databases and may have implications for the North American Numbering Plan by creating additional demand for numbers.²² Adcomm states, however, that its proposed amendments address only that aspect of Part 68 concerned with preserving the integrity of emergency services provided on the public switched telephone networks. Specifically, Adcomm's proposed rules are "... simply intended to align interface approaches without proposing to control user implementations or local exchange carrier (LEC) services."²³ Adcomm's proposal would: (1) require PBX equipment to provide specific location information of the calling station to enhanced 911 systems; (2) require premises owners to provide local telephone companies with information on their PBX systems; (3) require certain training, verification, supervision and testing procedures for PBX operation; (4) specify signal power limitations; and (5) set technical standards for compatibility with enhanced 911 systems, including trunk interface and signaling requirements.

14. *Industry Efforts.* The Telecommunications Industry Association (TIA), through a subcommittee of its Multiline Telecommunications Committee, has been working to develop technical standards for PBXs to resolve the Enhanced 911 problem.²⁴ In October, 1993, TIA issued a Technical Systems Bulletin (TSB-103) entitled "PBX and KTS Support of Enhanced 911 Calling Service", which addresses dialing, call routing, and caller location database issues associated with PBX and KTS support of enhanced 911 service providers. TIA anticipates final voting by the membership on these proposals in late 1994.

15. *Comments.* Commenters responding to Adcomm's petition generally acknowledge the need to ensure compatibility between PBXs and Enhanced 911 services, but take different positions on how compatibility may best be achieved. Bell Atlantic, BellSouth, GTE, and TIA urge the

Commission to delay action pending industry consensus on standards. The North American Telecommunications Association (NATA) and the South Carolina Budget and Control Board (SCBCB) contend that the Commission should lead any such industry effort. SCBCB states it cannot endorse the Adcomm proposal due to potential technical and financial hardships.²⁵ NATA objects to Adcomm's proposed verification requirements and opposes new training requirements on customer premises equipment (CPE) installation personnel.²⁶ NATA argues that LECs do not offer the kind of interconnection of switched services that would permit PBXs to transmit station identification in a format that could be accepted or processed by the telephone network.

16. APCO, which supports the petition, expresses concern about PBXs that block 911 calls in favor of an internal safety service. APCO is also concerned about the confusion caused when an extra digit must be dialed to get an outside line before dialing 911 from a PBX station in an emergency. BellSouth, GTE, and NATA express concern about the cost of dedicated 911 trunks and the impact of the proposal on the North American Numbering Plan (NANP).²⁷ Adcomm notes that the enhanced 911 trunking mentioned in its petition was not intended to require PBXs to have dedicated trunks to PSAPs. Adcomm states that, under its proposed rules, end users and LECs may choose different ways of handling trunking.²⁸ GTE suggests there are particular difficulties identifying the location of calls placed from college campuses, hospitals, military installations and wireless PBXs.²⁹

17. Commenters identified several specific elements that should be included in any resolution of the PBX/enhanced 911 compatibility issue. GTE states that compatibility will require the creation of a standard LEC/private switching system interface with identifying information for private switching system calling stations, private switching system compliance with NENA standards for the transmission of ALI data to the telephone company or caller location database, and the creation of either alternative number identification or Direct Inward Dial (DID) numbers for private switching system stations.³⁰ Bell Atlantic concurs with GTE that any technical standards should specifically include the signaling and protocol specifications that have been published by NENA, to ensure that calls sent from PBXs to 911 systems carry proper identifying information.³¹ NATA states that any rules the Commission adopts should ensure that telephone companies develop and market the least costly form of Enhanced 911 interconnection, and that such costs be fairly distributed.³² GTE

²¹ The problem may also exist for key telephone systems connected to Centrex. See TIA Technical Systems Bulletin (TSB-103), "PBX and KTS Support of Enhanced 911 Calling Service," (October, 1993) at 3.

²² The Commission is currently examining various issues regarding administration of the North American Numbering Plan. See *Administration of the North American Numbering Plan, Notice of Proposed Rulemaking*, CC Docket No. 92-237, 9 FCC Red 2068 (1994).

²³ Adcomm Reply at 2.

²⁴ TIA is a membership organization of domestic and international providers of telecommunications products and services. Through various committees, TIA develops engineering stan-

dards and publications that facilitate interchangeability and improvement of products. Standards developed by TIA committees and adopted by TIA ballots are voluntary industry standards that represent an industry consensus.

²⁵ SCBCB at 2.

²⁶ NATA 7-9.

²⁷ Bell South at 2; GTE at 5; NATA 2-23.

²⁸ Adcomm reply comments at 3.

²⁹ GTE at 5-6.

³⁰ GTE at 2-4.

³¹ Bell Atlantic at 1-2. A copy of the NENA protocol is attached as an appendix to Bell Atlantic's comments.

³² NATA at 4-5, 6-7.

asserts that a solution may also require added functionality in end office switches and additional telephone number assignments.³³

18. TIA contends that Part 68 should specify as few technical details as possible to avoid stifling technological advancement of enhanced 911 services and equipment. In order to assure that enhanced 911 services will work properly, TIA states that the regulations should: (1) clearly define the responsibilities of all entities involved; (2) reference the appropriate standards to be used, preferably national; (3) set reasonable deadlines for compliance; and (4) involve regulatory agencies in educating the public regarding the deployment and use of enhanced 911 calling service.

B. Discussion

19. We believe that federal rules for achieving uniformity are appropriate in these circumstances to avoid confusion among telephone users connected to PBXs and to ensure that PBX equipment operates on the public switched telephone network (PSTN) at an optimal level for emergency purposes. The Adcomm petition, the comments received, and published reports of difficulties in delivering emergency services to the proper location indicate that the incompatibility of PBXs with enhanced 911 systems is hampering public safety access through the public switched telephone network.

20. We propose to amend Part 68 of the rules to require compatibility of PBX equipment with enhanced 911 systems. We agree with Adcomm and several commenters that any Part 68 requirements must take into account industry standards, protocols and technical references. Moreover, the comments persuade us that any proposal for amending our rules must consider not only the delivery of ANI, but also issues such as ALI database administration and the delivery of other information, e.g., calling party number, to the PSAP that may facilitate a more timely emergency response. We, therefore, initiate a Notice of Proposed Rulemaking to require compatibility of PBX equipment with enhanced 911 systems. The proposed rules are patterned closely after those proposed by Adcomm, with modifications to reflect some of the commenters' concerns. We seek comment on these proposed rules.

21. In considering the proposed rules, our paramount concern is to ensure that PBX equipment does not hinder delivery of emergency services by impeding the transmission of adequate location information over the PSTN. We believe that any rules adopted must provide sufficient flexibility to foster the development of alternative methods and technological innovation in resolving compatibility problems between PBX and other dispersed private telephone systems and enhanced 911 systems. Moreover, we believe that the proposed rules should carefully balance the need to achieve compatibility and the need to ensure that equipment owners and manufacturers are not unduly burdened in implementing such upgrades. We seek comment on whether the proposed rules permit sufficient flexibility in conforming PBX systems to the needs of their owners while ensuring that the location of callers to 9-1-1 is properly identified to PSAP operators. We seek comment on whether and how equipment manufacturers, multi-line telephone system (MLTS) service providers, local exchange

carriers, public safety agencies, and others such as local building inspectors should be identified as responsible parties, as suggested in TSB-103. Commenters supporting this suggestion should discuss specific amendments to Part 68 that would achieve this objective. Further, we ask that commenters provide detailed analysis of the technical and cost considerations of implementing the proposed rules for equipment owners, equipment manufacturers, network service providers, and other affected parties. In addition, we seek comment on whether there are particular difficulties in applying the proposal to college campuses, hospitals, military installations or wireless PBXs, and on whether the proposed rules must be applied where the equipment serves a physically small location, such as a single story building, or a small number of closely situated telephone stations. Commenters should propose specific alternative language where they do not believe the proposed language is appropriate.

22. *911 Availability.* Both the Adcomm proposal and TSB-103 would require that PBX equipment properly route emergency calls dialed using the digits 911 or 9-911 (where 9 must be dialed to reach outside lines). TSB-103 notes that special dialing or routing features in PBX equipment, such as dial 9 blocking to prevent toll fraud and Automatic Route Selection for least cost routing, should not be implemented in ways that prevent 911 dialing. We tentatively conclude that a caller at a PBX station having the capability to reach the public switched network should have the ability to reach emergency services by dialing 911 without having to dial any additional digits. TSB-103 suggests that some form of user education or notification may be appropriate to ensure proper dialing by the casual user of terminal equipment within a PBX or dispersed private telephone system. We further propose to require that PBX equipment domestically manufactured or imported prior to the proposed implementation date of the rules be labelled with a warning describing its limitations for those attempting to use it to call enhanced 911. We seek comment on these proposed rules.

23. *Attendant Notification.* TSB-103 recommends that new PBX equipment be capable of alerting an attendant or other on-premises personnel and providing calling station information to such personnel when a 911 call is dialed. On-premises personnel may assist emergency services personnel in locating or assisting the caller, particularly on large premises like schools, hotels, or military installations. TSB-103 points out that some state laws prohibit attendant "bridge-on" to a 911 call (e.g., a three way emergency call that includes the 911 caller, an attendant, and the PSAP operator) because it may create confusion. We propose to require PBX equipment to be capable of notifying an attendant, if one is present, and seek comment on our proposal. See Appendix C, proposed §68.320(e). We ask that commenters discuss any potential conflict with existing state or local regulations.

24. *ALI database maintenance.* Several commenters, as well as TSB-103, note that timely and accurate database maintenance is an essential element of enhanced 911 service. TSB-103 contends that any regulations should clearly define the responsibilities of all parties involved in implementing an enhanced 911 system. As noted above, accurate caller location information is vital to ensuring the timely delivery of emergency services through the public

³³ GTE at 2-3, 4-6.

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