



PUBLIC NOTICE

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FCC'S PUBLIC SAFETY AND HOMELAND SECURITY BUREAU REMINDS TELECOMMUNICATIONS SERVICE PROVIDERS OF IMPORTANCE OF IMPLEMENTING ADVISORY COMMITTEE 9-1-1 AND ENHANCED 9-1-1 SERVICES BEST PRACTICES

The Federal Communications Commission's (FCC's) Public Safety and Homeland Security Bureau (Bureau) reminds telecommunications service providers of the importance of providing diversity and redundancy in the provisioning of 9-1-1/Enhanced 9-1-1 (911/E911) services. The Bureau encourages telecommunications service providers to adhere to 911/E911 service best practices developed by the former Network Reliability and Interoperability Council (NRIC), a Federal Advisory Committee established pursuant to the Federal Advisory Committee Act¹ to advise the Commission regarding network reliability and interoperability.²

NRIC best practice 7-7-0566 addresses 911/E911 communications services and specifically identifies the need for diversity in equipment and lines used to provide 911/E911 communications services. Notably, NRIC best practice 7-7-0566 states that:

Network Operators and Service Providers should consider placing and maintaining 911 circuits over diverse interoffice transport facilities (e.g., geographically diverse facility routes, automatically invoked standby routing, diverse digital cross-connect system services, self-healing fiber ring topologies, or any combination thereof).³

¹ 5 U.S.C. App. 2.

² In 2007, NRIC was replaced by the Communications Security, Reliability and Interoperability Council (CSRIC), whose task is to recommend best practices and other actions the Commission can take to enhance the security, reliability and operability of communications systems, including 911/E911. In addition, as required by the NET 911 Act, the Commission will work cooperatively with public safety organizations, industry participants, and the E-911 Implementation Coordination Office to develop best practices that define "network diversity requirements for delivery of IP-enabled 9-1-1 and enhanced 9-1-1 calls." New and Emerging Technologies 911 Improvement Act of 2008, Pub. L. No. 110-283, 122 Stat. 2620 (2008) (NET 911 Act) (amending Wireless Communications and Public Safety Act of 1999, Pub. L. No. 106-81, 113 Stat. 1286 (1999) (Wireless 911 Act)), § 101(2); Wireless 911 Act § 6(h).

³ Available at <https://www.fcc.gov/nors/outage/bestpractice/ProcessBestPractice.cfm?RequestTimeout=500> (last visited Feb. 17, 2010).

Through an examination of network outage reports filed through the Commission's Network Outage Reporting System (NORS)⁴, the Bureau has observed a significant number of 911/E911 service outages caused by a lack of diversity that could have been avoided at little expense to the service provider. Examples of such lack of diversity include the following:

- Placement of all E911 trunks for a central office or all E911 lines or Automatic Location Identification (ALI)⁵ links for a Public Safety Access Point (PSAP) on the same Digital Cross-connect System (DCS),⁶ which later failed.
- Placement of all E911 trunks for a central office or all E911 lines or ALI links for a PSAP on the same DS1,⁷ which failed due to a single line cut.
- Placement of all E911 trunks for a central office or all E911 lines or ALI links for a PSAP on the same DS1, which later failed because transmission equipment serving that DS1 had only one control processor (in one instance) or one power supply (in a second instance).
- Failure of all E911 trunks for a central office or all E911 lines or ALI links for a PSAP because of failure of one fuse.
- Failure of the E911 lines between the Selective Router⁸ and the PSAP served by one Remote Terminal,⁹ that subsequently experienced a problem when the high speed side of the terminal was operating in simplex.¹⁰
- Failure of E911 trunks served by redundant timing cards,¹¹ or line or switch cards; when the second member of a pair failed before the first was finally repaired.

⁴ The Network Outage Reporting System (NORS) is the web-based filing system through which communications providers covered by the Part 4 reporting rules submit reports of service disruptions to the FCC. *See* 47 C.F.R. Part 4; *see also* "Network Outage Reporting System (NORS)," *available at* <http://www.fcc.gov/pshs/services/cip/nors/nors.html> (last visited May 12, 2009).

⁵ The Automatic Line Identification feature automatically provides the telephone number of the E911 caller to the PSAP.

⁶ A Digital Cross-connect System is a piece of transmission equipment that allows lower speed digital signals, such as DS1s, to be rearranged and interconnected among terminating higher speed signals, such as DS3s, that contain the lower speed signals. The rearrangement is done under software control. This is not a manual patch panel.

⁷ A DS1 signal is a 1,544,000 bit per second signal.

⁸ The Selective Router is a local switch which routes 911 calls to the correct PSAPs for the various callers, regardless of the callers' locations.

⁹ A Remote Terminal is a kind of transmission equipment which can carry multiple lines, including multiple lines between a PSAP and a Selective Router.

¹⁰ For systems with redundant subsystems, simplex operation refers to a state where one of the duplicated subsystems has failed, but the system has continued to operate on the other copy of the duplicated subsystem. While the system is operating in a simplex state, a single failure of the remaining subsystem can cause the entire system to fail. Thus a system operating in a simplex state is in a state of increased risk of failure.

¹¹ Timing cards provide accurate synchronization information to equipment.

It appears that many 911/E911 service outages could be avoided by providing diversity, redundancy, and/or prompt repair of failed equipment even in cases where that failed equipment is backed up and not causing an immediate service failure.

Whenever possible, telecommunications service providers should avoid placing an entire group of 911/E911 trunks or ALI links on one piece of transmission equipment. If this cannot be avoided, the device should at least be provisioned so that no single card or other failure will disrupt the performance of 911/E911. Finally, if cards are provided redundantly, when one of the redundant cards fails, it is desirable that it be repaired quickly, even if it is backed up by another card that has not yet failed. The Bureau encourages telecommunications service providers to adhere to 911/E911 service best practices developed by the NRIC.¹²

Finally the Commission wishes to note two NRIC best practices that communications providers are apparently following, resulting in a reduction in severity and frequency of outages:

- NRIC Best Practice 7-7-0568. Network Operators and PSAPs should establish a routing plan so that in the case of a lost connection from the selective router to the PSAP, 911 calls are routed to an alternate answering point (e.g., alternate PSAP, appropriate telephone line).¹³
- NRIC Best Practice 7-5-0569.
 - Option 1: public switched telephone network (PSTN) as a Backup for 911 Dedicated Trunks. To ensure that 911 is minimally affected by potential traffic congestion sometimes experienced in the PSTN, PSAPs commonly create dedicated private public safety networks. A low-cost alternative for handling 911 calls during periods of failure in the end office-to-911 tandem transport facility, is to use the PSTN as a backup between the caller's end office and the 911 tandem switch. Such applications may or may not make use of adjunct devices that monitor primary trunk path integrity. If the primary path to the 911 Tandem switch should be interrupted or all-trunks-busy, the call may be forwarded over the PSTN to a preprogrammed directory number. Further, the caller may be identified if the administrative line is equipped with a caller identification (ID) device.
 - Option 2: Wireless Network as Backup for 911 Dedicated Trunks. Similar to the PSTN backup for completing 911 calls when the primary transport facility is interrupted, wireless networks may provide more diversity than the PSTN alternative.¹⁴

¹² Available at <https://www.fcc.gov/nors/outage/bestpractice/BestPractice.cfm> (last visited Feb. 17, 2010). As noted above, both the Commission and CSRIC will continue to consider new or updated best practices to enhance communications reliability, including 911/E911 reliability.

¹³ Available at <https://www.fcc.gov/nors/outage/bestpractice/ProcessBestPractice.cfm?RequestTimeout=500> (last visited Feb. 17, 2010).

¹⁴ Available at <https://www.fcc.gov/nors/outage/bestpractice/ProcessBestPractice.cfm?RequestTimeout=500> (last visited Feb. 17, 2010).

Many telecommunications service providers had representatives on the NRIC¹⁵ and assisted the council in developing best practices for providing network reliability, including for emergency communications.¹⁶

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¹⁵ For example, companies and organizations represented on NRIC VII included Alcatel; Allegiance Telecom, Inc.; ALLTEL; Alliance for Telecommunications Industry Solutions; American Petroleum Institute; Association of Public Safety Communications Officials; AT&T; BellSouth Communications; BITS; Boeing Company; Century Telephone; Cingular Wireless; Cisco Systems; Comcast Cable Communications Inc.; Communications Workers of America; Cox Communications; EarthLink, Inc.; e-Commerce & Telecommunications Users Group; Ericsson, Inc.; Federal Reserve System; Intelsat, Ltd.; Intrado; Juniper Networks; Level 3 Communications, Inc.; Lockheed Martin Corporation; Lucent Technologies; MCI; Microsoft Corporation; Motorola; National Association of Regulatory and Utility Commissioners; National Association of State 911 Administrators; National Association of State Telecommunications Directors; National Communications System; National Emergency Number Association; National Telecommunications and Information Administration (Department of Commerce); Nokia Inc.; Nortel Networks; North American Electric Reliability Council; City of New York, Dept. of Information Technology and Telecommunications; Office of Science and Technology Policy - White House; Qualcomm; Qwest; Savvis; SBC; Syniverse Technologies Inc; Telecommunications Systems; Time Warner; T-Mobile (VoiceStream); Trace Research and Development Center; VeriSign; Verizon Communications; and Verizon Wireless.

¹⁶ See “NRIC Best Practices,” available at <https://www.fcc.gov/nors/outage/bestpractice/BestPractice.cfm> (last visited on March 1, 2010).