ATIS-0100055

NETWORK RELIABILITY STEERING COMMITTEE 2013-2014
OPERATIONAL REPORT

As a leading technology and solutions development organization, the Alliance for Telecommunications Industry Solutions (ATIS) brings together the top global ICT companies to advance the industry's most pressing business priorities. ATIS' nearly 200 member companies are currently working to address the All-IP transition, network functions virtualization, big data analytics, cloud services, device solutions, emergency services, M2M, cyber security, network evolution, quality of service, billing support, operations, and much more. These priorities follow a fast-track development lifecycle — from design and innovation through standards, specifications, requirements, business use cases, software toolkits, open source solutions, and interoperability testing.

ATIS is accredited by the American National Standards Institute (ANSI). The organization is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP), a founding Partner of the oneM2M global initiative, a member of and major U.S. contributor to the International Telecommunication Union (ITU), as well as a member of the Inter-American Telecommunication Commission (CITEL). For more information, visit www.atis.org.

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TO: Stakeholders of the Nation's Public Communications Networks

Service disruptions, although infrequent, remind us how dependent we are on the communications networks. During these events, communication providers demonstrated how seriously they take their responsibility to provide reliable services for consumers and businesses, expending significant efforts to mitigate outages and quickly restore service. Once service is restored, equal efforts are expended to analyze the disruption, identify areas for improvement, and implement those improvements. The owners and operators of these networks, along with the equipment vendors they partner with, are firmly committed to building and maintaining reliable and resilient networks. This commitment has been demonstrated again and again – on a day-to-day basis, and in the face of natural and manmade disasters.

The Network Reliability Steering Committee (NRSC) remains committed to this effort by analyzing outage and reliability trends and recommending actions that can help prevent outages or reduce their impact. Its members work together to ensure that communication systems continue to remain secure and reliable. These efforts ultimately benefit consumers, business, the industry, and the nation as a whole.

This report provides a snapshot of the issues addressed by the NRSC over the last two years. As you'll see, the efforts of the NRSC, guided by input from member company subject matter experts as well as the FCC, are primarily directed toward ensuring that meaningful data is being collected and analyzed to better understand the cause and mitigation of outages. Ultimately, the NRSC utilizes this information to develop industry guidance that directly impacts and improves the nation's networks. These efforts build upon previous NRSC work, and form a strong foundation for ensuring that communication networks continue to be reliable and resilient. This foundation is especially useful in light of ongoing momentous changes to the communications network, including the significant growth of wireless networks and the evolution to an All-IP network. The nation depends on these networks to provide emergency communications, enable commerce, and support individual communications. As these changes to the network occur, the NRSC remains committed to, and will continue working toward, maintaining network reliability and resiliency.

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About the NRSC

The Alliance for Telecommunications Industry Solutions (ATIS) NRSC addresses network reliability improvement opportunities of service providers and vendors, in a noncompetitive environment, and allows participants to develop standards, technical requirements, technical reports, bulletins, Best Practices, and reports on the health of the nation's communications networks. The NRSC also coordinates industry improvements in network reliability through outage analysis. The mission statement of the NRSC is:

> ***The NRSC strives to improve network reliability by providing timely consensus-based technical and operational expert guidance to all segments of the public communications industry.***[1]

The NRSC is deeply committed to intra-industry collaboration, which is essential in ensuring that the industry's expertise is available to monitor and address critical trends in the reliability of our nation's public communications networks. The NRSC addresses these critical trends by:

- Identifying potential network reliability issues through an opportunity evaluation process;
- Establishing teams to work specific reliability issues;
- Conducting special studies to develop industry recommendations and/or Best Practices;
- Providing industry feedback to the Federal Communications Commission Public Safety and Homeland Security Bureau (FCC) on network reliability and on the FCC's Network Outage Reporting System (NORS) and Disaster Information Reporting System (DIRS); and
- Serving as a public educational resource on network outage trends and the industry's ongoing efforts to resolve network reliability concerns.

This Operational Report covers the period of 2013 through 2014. A brief summary of the history of the NRSC is provided in the *Introduction* of this report (page 6).

[1] The Mission Statement of the NRSC is available on the ATIS NRSC site < http://www.atis.org/nrsc/index.asp >.

Changing Regulatory Environment & Changing Industry

The previous NRSC Operational Report in 2012 cited an increased focus on issues related to network reliability and resiliency and to the obligation of industry to report communications outages. This focused attention has, if anything, increased over the last several years, with numerous regulatory measures being enacted and industry responding to various high profile service interruptions. Continuity of emergency services, cybersecurity, and the move to an All-IP network have received the bulk of attention, although reliability of legacy networks remains a critical piece of the equation.

Extension of Outage Reporting to Voice over IP (VoIP). In 2012, the FCC extended its outage reporting rules to interconnected VoIP service providers, noting that consumers are increasingly using interconnected VoIP services in lieu of traditional telephone service. The interconnected VoIP rules are based on the existing legacy network reporting rules, and in 2014, the FCC indicated they are planning on revising those rules, possibly in 2015, to more accurately reflect the realities of an All-IP network.[2]

Network Reliability and Resiliency. In 2013, the FCC proposed improving the resiliency of mobile wireless networks by requiring public disclosure, on a daily basis, of the percentage of cell sites operational during a disaster for each carrier, and perhaps extending this requirement to all network types.

911. In 2013, the FCC released a Report and Order aimed at maintaining 911 service during a disaster. The report suggests that network operators undertake activity in four primary areas: maintain adequate central office backup power; have reliable network monitoring systems; conduct periodic audits of 911 circuits; and notify 911 call centers of problems. The Report and Order requires operators to report on these areas, certifying either implementation of specific Best Practices or implementation of alternative measures.

Cybersecurity. With the transition to an All-IP network, cybersecurity has taken on added significance and the FCC has increased its attention to this topic. During the most recent convening of the FCC's Communications Security, Reliability, and Interoperability Council (CSRIC-IV) and its Technological Advisory Council (TAC), the FCC chartered a CSRIC Working Group (WG-4) to determine how best to ensure implementation of cybersecurity measures. That Working Group delivered a 300+ page Final Report, and the FCC immediately issued a Public Notice about this report, seeking comments on how well the Final Report met the goal and what other measures could be taken to ensure cybersecurity.

While the industry and the underlying network technologies may be evolving, the role of the NRSC remains constant. The NRSC provides expert industry guidance regarding communications reliability issues to ensure that US communications networks remain highly reliable and robust, even during their constant evolution.

[2] The FCC adopted the *Amendments to Part 4 of the Commission's Rules Concerning Disruptions To Communications NPRM*. (DA No. 15-710). (Dkt No 15-80), on March 30, 2015.

Highlights

During the 2013 to 2014 timeframe, the NRSC convened seven special studies, undertook three special initiatives, and reviewed and provided comments for high profile regulatory filings. Along with its special study teams, the NRSC also had three standing Subcommittees. The covered topics included:

- Special Studies:
    - Copper Theft Deterrent Subteam.
    - Fiber Cut Task Force.
    - IP Reliability Task Force.
    - Service Provider Procedural Outage Task Force.
    - Large DS3 Outage Investigation Subteam.
    - DS3 Simplex Condition Subteam.
    - Planned Maintenance Task Force.

- Subcommittees:
    - Best Practice Subcommittee.
    - Outage Reporting Advisory Subcommittee.
    - Regulatory Subcommittee.

- NRSC Initiatives, Studies, and Filings:
    - Initiatives:
        - Best Practices Tutorial and Guidance for CSRIC IV.
        - Best Practices Website Review and Updates.
        - Launch of IP Reliability Task Force to address VoIP outage reporting.
    - Filings
        - Improving the Resiliency of Mobile Wireless Communications Networks Notice of Proposed Rulemaking (2014).
        - Improving 9-1-1 Reliability Notice of Proposed Rulemaking (2013).

Additionally, the following activities were completed:

- Three NRSC Bulletins were published.
- One ATIS Standard was published.

1 Introduction

1.1 History of the NRSC

Several Catastrophic Outage Events

From 1988 through the early 1990s, the United States communications industry experienced several network outages that impacted a large number of subscribers. Beginning with the "Great Hinsdale Fire" of 1988, through several Signaling Transfer Point (STP) outages in 1991, the nation increased its focus on the reliability of its public networks.

The Network Reliability Council is Established

In November 1991, the Network Reliability Council (NRC) was established by the FCC to bring together telecommunications industry leaders and telecommunications experts from academic and consumer organizations to explore and recommend measures to enhance network reliability.[3]

The FCC Mandates Outage Reporting

In April 1992, the FCC required the reporting of outages by exchange and interexchange service providers. In order for an event to be reportable, it had to last 30 minutes or more and potentially affect at least 50,000 customers.[4] The industry-led NRC afterward recommended that the reporting criteria be lowered to 30,000 customers. Another NRC recommendation was to report all outages affecting 911 emergency call centers, major airports, nuclear power plants, major military installations and key government facilities. Carriers began reporting outage events using the lowered threshold criteria in June 1992. Because of the sensitive nature of some of the outage events (e.g., military installations), in May 1993, the National Communications System (NCS) accepted the task of reporting such outages to the FCC. In August 1994, FCC outage reporting regulations were revised.[5] Most of the changes had already been accounted for by industry in their voluntary reporting of events that began in June 1992. Other major changes included the reporting of fire-related incidents potentially affecting 1,000 or more lines, and the requirement that final reports include root cause analysis and a review of how Best Practices could have prevented or mitigated the impact of such events.

The NRC Recommends the Formation of the NRSC

In its 1993 *Report to the Nation*, the NRC[6] recommended the formation of the NRSC, under the auspices of the ATIS, for the purpose of monitoring network reliability on an ongoing basis. As defined at that time, the NRSC's mission was to "analyze the industry's reporting of network outages to identify trends, distribute the results of its findings to industry, and where applicable, refer matters to appropriate industry forums for further resolution, in order to help ensure a continued high level of network reliability."[7]

The FCC Makes Changes in Outage Reporting

In 2005, FCC regulations regarding outage reporting were put in force.[8] These mandates can be summarized as having three major aspects: (a) expansion regarding who was required to report; (b) new reporting thresholds, timeframes, and concepts; and (c) limited access to the outage data due to confidential protection under the Freedom of Information Act (FOIA). Regarding the reporting expansion, in addition to wireline providers, the new requirements included wireless, satellite, paging, and cable telephony service providers. Changes in the

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[3] Daugherty, H.T., Klein, W. J., "U.S. Network Reliability Issues and Major Outage Performance", *IEEE Computers and Communications, 1995. Proceedings. IEEE Symposium on*, vol , no. , pp.114, 119, 27-29 Jun 1995.

[4] *FCC Report and Order, CC Docket No. 91-273*, Federal Communications Commission, Washington, D.C., adopted February 13, 1992, released February 27, 1992.

[5] *FCC Second Report and Order, CC Docket No. 91-273*, Federal Communications Commission, Washington, D.C., adopted July 14, 1994, released August 1, 1994.

[6] Since the subsequent re-charters under the name "Network Reliability and Interoperability Council (NRIC)", this first Council is sometimes referred to as "NRC-1".

[7] *Network Reliability: A Report to the Nation*, Network Reliability Council, June 1993. Section I, p. 6.

[8] *Report and Order and Further Notice of Proposed Rulemaking*, ET Docket No. 04-35, adopted August 4, 2004, released August 19, 2004; E*rrata*, ET Docket No. 04–35, released September 3, 2004.