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

In the Matter of

The Proposed Extension of Part 4 of the Commission’s Rules Regarding Outage Reporting to Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers

PS Docket No. 11-82

REPLY COMMENTS
OF THE ALLIANCE FOR TELECOMMUNICATIONS INDUSTRY SOLUTIONS

October 7, 2011

Thomas Goode
General Counsel
ATIS
1200 G Street, NW
Suite 500
Washington, DC 20005
(202) 628-6380
Contents

SUMMARY...............................................................................................................................ii
I. COMMENTS..........................................................................................................................2
   A. There Is No Evidence that New Reporting Rules Are Necessary.........................2
   B. To the Extent that Any New Reporting Mechanisms are Implemented,
      They Should Be Voluntary and Developed in Collaboration with the
      Industry.........................................................................................................................6
   C. More Reasonable Reporting Metrics and Timeframes Are Necessary..............8
   D. There is Strong Opposition to the Adoption of the Commission’s Proposed
      Performance Criteria.................................................................................................11
   E. Outage Reporting Data Must Remain Confidential..............................................13
II. The Commission Should Streamline its Existing Outage Reporting Rules..........14
III. Conclusion....................................................................................................................16
SUMMARY

ATIS NRSC notes that the comments in response to the NPRM in this proceeding show that the communications industry recognizes the critical importance of network reliability and takes seriously its responsibility to provide customers with reliable service. ATIS NRSC believes that there is broad agreement that the substantial costs of the proposed rules would outweigh their benefits. Moreover, new regulatory mandates are unnecessary because commenters correctly observe that there is no direct causal relationship between outage reporting and reliability and that the marketplace already provides the best incentive for network reliability.

ATIS also notes that voluntary collaborative efforts are more effective than regulatory mandates and recommends that the Commission consider the significant input from the industry regarding this matter.

ATIS NRSC urges the Commission to ensure that any reporting metrics for interconnected VoIP and broadband ISPs are reasonable. ATIS notes that many commenters suggested metrics that are consistent with, or similar to, those recommended by the ATIS NRSC and noted that, in particular, many shared ATIS’ view that any new reporting metrics define an “outage” to mean a total loss of service. Significant concerns have been raised by numerous commenters, including ATIS, over the Commission’s proposal to require outage reporting based on performance metrics such as packet loss, latency or jitter.

ATIS also notes that many commenters remarked that the current deadlines for the filing of outage Notifications are not reasonable. ATIS NRSC reiterates its support for the proposed reporting timeframes and structure outlined in its comments.

ATIS strongly urges the Commission to protect as confidential any data provided under its existing, or any future, outage reporting requirements. In response to comments addressing state access to NORS data, ATIS observes that this issue is the subject of a separate rulemaking and recommends that the Commission consider the comments made by ATIS in that rulemaking. ATIS also recommends that the same restrictions on access to NORS data should apply, regardless of whether the data pertains to the PSTN or to broadband networks.

Finally, ATIS NRSC strongly urges the Commission to consider whether there are opportunities to streamline its existing outage reporting obligations as part of this rulemaking.
Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of

PS Docket No. 11-82

The Proposed Extension of Part 4 of the Commission’s Rules Regarding Outage Reporting to Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers

REPLY COMMENTS
OF THE ALLIANCE FOR TELECOMMUNICATIONS INDUSTRY SOLUTIONS

The Alliance for Telecommunications Industry Solutions (ATIS) on behalf of its Network Reliability Steering Committee (NRSC), hereby submits these reply comments in response to the Commissions’ Notice of Proposed Rulemaking (NPRM) in the above-referenced docket. As noted below, the comments in this proceeding demonstrate that there is no need for the Commission to expand its Part 4 rules to interconnected VoIP or broadband internet service providers (ISPs). There is also significant agreement among the commenters that, to the extent that additional outage information is sought, the Commission should collect such information on a voluntary basis in collaboration with the industry and based on reasonable metrics.
I. Comments

ATIS appreciates the opportunity to reply to the comments made by other parties in response to the Commission’s NPRM. ATIS notes that, while the vast majority of commenters do not support the Commission’s proposed outage reporting requirements, there is no doubt that service providers and others in the industry recognize the critical importance of network reliability. It is also clear that the industry takes seriously its responsibility to provide customers with reliable service.

The issue at hand, therefore, is not whether to protect the network or to provide reliable service to consumers for emergency and routine communications, but rather whether there is a need for new broadband or interconnected VoIP outage reporting mandates to promote such reliability. ATIS believes that the comments from the communications industry clearly demonstrate that such mandates are unnecessary. ATIS further believes that the comments clearly identify a need to resolve issues pertaining to the Commission’s authority before any new outage reporting mandates could be implemented.

A. There Is No Evidence that New Reporting Rules Are Necessary

As ATIS explained in its comments, ATIS believes that the Commission has not justified the need for new outage reporting rules.\(^1\) The vast majority of commenters support this view.

The American Cable Association (ACA), for example, notes that “there is no evidence calling into doubt the resiliency and reliability of broadband networks.”\(^2\) XO Communications, LLC (XO) states that the record “lacks any credible evidence that end users would benefit from

\(^1\) ATIS Comments at pp. 6-9.

\(^2\) Comments of ACA at p. 2.
the proposed extension of the outage reporting requirements.”\textsuperscript{3} CTIA – The Wireless Association\textsuperscript{TM} suggests that the proposed rules may be premature “[a]bsent quantification of the capabilities of broadband wireless technology.”\textsuperscript{4} AT&T, Inc. (AT&T) notes that the existence of some outages does not translate into the need to fashion an elaborate reporting scheme to monitor them. “There is no evidence that providers who maintain the affected networks have not or would not – in the absence of Commission intervention – conduct a root-cause analysis and take steps to address any issues giving rise to a service disruption.”\textsuperscript{5}

CenturyLink notes that “no outage reporting by interconnected VoIP service providers or broadband ISPs is necessary in order to achieve the Commission's goals of addressing broadband communications system vulnerabilities, helping prevent future outages through the development and refinement of best practices, and coordinating with individual and groups of reporting providers.”\textsuperscript{6} MegaPath similarly notes that governmental compulsion is unnecessary as VoIP and broadband providers are already highly motivated to quickly find and fix any outages that may occur.\textsuperscript{7}

Commenters also correctly ascertain that the proposed outage reporting rules would also not result in the submission of meaningful, customer-impacting data. Verizon and Verizon Wireless (Verizon) in its comments note that the rules would require that providers report outages even when there is no end user impact.\textsuperscript{8} Time Warner Cable Inc. (TWC) reports that

\textsuperscript{3} Comments of XO at p. 4.
\textsuperscript{4} Comments of CTIA – The Wireless Association at p. 7.
\textsuperscript{5} Comments of AT&T at p. 14.
\textsuperscript{6} Comments of CenturyLink at p. 20.
\textsuperscript{7} Comments of MegaPath at p. 4.
\textsuperscript{8} Comments of Verizon at p. 17.
cyber attacks, which are cited as a key justification for imposing outage reporting requirements, do not generally target the physical transmission layer that would be encompassed by the proposed rules.\textsuperscript{9} CTIA – The Wireless Association notes that because there are a number of alternate paths available to the typical wireless broadband user, an outage of a facility for broadband Internet access may in fact have no effect on the ability of the network to continue to send and receive traffic – meaning that there is no impact on the end user.\textsuperscript{10}

Many commenters also agree with ATIS that the substantial costs of the proposed rules would outweigh the benefits. ACA notes that “the costs that would be incurred by broadband ISPs and VoIP service providers to develop and deploy systems for reporting outages in the manner suggested by the NPRM would outweigh any putative benefits the Commission anticipates it would gain by collecting such information, and would divert money from other network upgrades that would increase speeds and expand coverage, other objectives important to the Commission.”\textsuperscript{11} The United Stated Telecom Association (USTelecom) notes that the burdens associated with the proposed reporting requirements would detract from existing programs that currently address reliability and divert limited resources from operational needs to administrative ones.\textsuperscript{12}

Moreover, most comments note that there is no direct causal relationship between outage reporting and reliability. AT&T correctly notes that the Part 4 rules don’t create any incentives on owners or providers of networks to make their networks more efficient or reliable. “The Part

\textsuperscript{9} Comments of TWC at p. 8.

\textsuperscript{10} Comments of CTIA – The Wireless Association at p. 4.

\textsuperscript{11} Comments of ACA at pp. 2-3.

\textsuperscript{12} Comments of USTelecom at pp. 1-2.
4 rules are merely a reporting mechanism.”\textsuperscript{13} MegaPath Inc. (MegaPath) agrees and notes that “[w]hile it is true that each year greater numbers of interconnected VoIP providers generate increased traffic volume for 9-1-1 services, there is no correlation between expanded outage reporting and the maintenance of emergency preparedness.”\textsuperscript{14} T-Mobile USA, Inc. (T-Mobile) finds that the Commission’s attempt to tie outage reporting to greater resiliency and reliability is based on a “flawed” premise that network security, reliability, and resiliency information would not be shared throughout the industry without a mandatory reporting obligation.\textsuperscript{15} T-Mobile also states that the industry already voluntarily shares outage information through membership in industry organizations such as the NRSC.\textsuperscript{16}

Commenters also note that the marketplace already provides the best incentive for network reliability, making it unnecessary for new regulatory mandates. T-Mobile notes for example that “there is no evidence that market forces are insufficient to ensure that interconnected VoIP and Broadband Providers’ networks remain reliable, secure, and resilient.”\textsuperscript{17} USTelecom agrees. “[I]mposition of outage reporting obligations is unnecessary because broadband providers already are incented to engineer robust mechanisms and procedures into their broadband networks to ensure substantial reliability and resiliency.”\textsuperscript{18} Vonage Holdings Corp. (Vonage) reports that market forces do present significant incentives for companies to provide reliable service, explaining that customer churn “carries the risk of fallout

\textsuperscript{13} Comments of AT&T at p. 13.
\textsuperscript{14} Comments of MegaPath at p. 6.
\textsuperscript{15} Comments of T-Mobile at p. 4.
\textsuperscript{16} Id. at p. 5.
\textsuperscript{17} Id. at p. 3.
\textsuperscript{18} Comments of USTelecom at p. 2.
in the financial markets, a critical concern for publicly traded companies like Vonage.”\textsuperscript{19} XO states that “additional reporting requirements are not needed to change incentives, because the marketplace already creates far greater incentives to prevent outages than the proposed regulations.”\textsuperscript{20}

B. To the Extent that Any New Reporting Mechanisms are Implemented, They Should Be Voluntary and Developed in Collaboration with the Industry

ATIS in its comments observed that a voluntary reporting program would be superior to regulatory mandates in many ways. A voluntary program, for example, would allow the industry and the Commission to more easily adapt the reporting program to reflect changes in network technologies, encourage industry experts to collaborate more effectively, and allow the industry and Commission to use their experiences with outage reporting to better tailor the reporting program to eliminate unnecessary reporting requirements and burdens.\textsuperscript{21} This position is supported by numerous commenters.

AT&T suggests that, “[s]ubject to a ruling on the Commission’s jurisdiction to impose the proposed outage reporting rules on VoIP Providers and ISPs, the Commission ought to consider voluntary reporting for the short term, if not permanently.”\textsuperscript{22} Such a period of voluntary reporting can help provide the Commission with information that is “sorely missing” but necessary for the Commission to make an informed decision as to whether any reporting is even justified.\textsuperscript{23} T-Mobile agrees and notes that “it would be premature to extend mandatory

\textsuperscript{19} Comments of Vonage at p. 6.
\textsuperscript{20} Comments of XO at p. 3.
\textsuperscript{21} Comments of ATIS at p. 16.
\textsuperscript{22} Comments of AT&T at p. 17.
\textsuperscript{23} Id at p. 18.
outage reporting as proposed in the NPRM until (i) industry standards bodies such as ATIS, through the NRSC, have fully evaluated the issue, (ii) best practices have been designed and implemented to address interconnected VoIP and Broadband Service outages, and (iii) sufficient time has elapsed to determine whether these best practices obviate the need for a mandatory reporting regime."

CTIA – The Wireless Association also urges the Commission to work with ATIS NRSC to launch a trial to develop best practices for reporting wireless VoIP and ISP disruptions, noting that “the NRSC’s consensus-based and open processes make it an ideal forum to develop and update voluntary standards and best practices that represent the best thinking of both the industry and regulators.”

Level 3 Communications, LLC (Level 3) similarly believes that more formalized input from an industry standards body or a Commission-established advisory committee should be considered before the Commission crafts any final rules. The National Cable & Telecommunications Association (NCTA) states that it believes that “the Commission should engage industry about how their networks operate to guard against outages and learn whether there are recurring issues that rise to the level of the need for a reporting regime.” CenturyLink adds that the Commission’s stated goals can be accomplished through the work of existing federal advisory committees, public-private work groups, industry forums, and

24 Comments of T-Mobile at p. 5.
26 Comments of Level 3 at p. 6.
27 Comments of NCTA at p. 16.
voluntary information sharing between the Commission and service providers.\textsuperscript{28} Verizon in its comments similarly recommends that, to the extent the Commission requires additional broadband reliability data, it could promote the industry’s establishment of a voluntary IP outage reporting program. “Obtaining information in this manner would be consistent with the President’s and the Chairman’s commitment to regulatory humility and to limiting the burdens associated with unnecessary regulation.”\textsuperscript{29}

C. More Reasonable Reporting Metrics and Timeframes Are Necessary

In its comments, ATIS NRSC proposed reporting metrics for interconnected VoIP and broadband ISPs.\textsuperscript{30} ATIS believes that these reporting metrics and timeframes are more reasonable and less burdensome than those proposed by the Commission in the \textit{NPRM}.

For interconnected VoIP providers, ATIS NRSC recommended that reports be required only for outages lasting a minimum of 120 minutes that potentially affect at least 900,000 user minutes of interconnected VoIP service and result in complete loss of service or that potentially affect a 9-1-1 special facility. For broadband ISP outages, the NRSC recommended that the metrics be dependent on the impact of the outage. For outages impacting access regions, the NRSC supported the filing of outage reports based on a user minute metric for edge devices (e.g., switches, routers, etc.) for outages that result in complete loss of service lasting a minimum of 120 minutes. For broadband ISP outages impacting metro or national regions, the NRSC

\textsuperscript{28} Comments of CenturyLink at p. 20.
\textsuperscript{29} Comments of Verizon at p. 8.
\textsuperscript{30} Comments of ATIS at p. 14.
recommended the filing of outage reports for outages lasting 120 minutes or more, resulting in the complete loss of service and impacting a minimum of 100,000 customers.\textsuperscript{31}

Many commenters have suggested metrics that are consistent with, or similar to, those recommended by ATIS NRSC. A common theme among these recommendations is that any new reporting metrics should define an “outage” to mean a total loss of service. AT&T recommends that “the Commission avoid use of the term ‘service degradation’ because it gives the false impression that deviation from a mean would translate into inability to transport data in a useful manner.”\textsuperscript{32} Level 3 recommends that equipment failures should be reported when they cause “a significant and noticeable disruption of a voice call.”\textsuperscript{33} TWC similarly recommends that “interconnected VoIP providers should be required only to report ‘outages’ that consist of actual losses of service meeting the relevant time and user thresholds, not attributes that amount to measures of service quality.”\textsuperscript{34} Sprint Nextel Corporation (Sprint Nextel) notes that a reporting standard based on service degradation is “overly subjective” and recommends instead “that the Commission require the filing of outage reports only in the event of a complete loss of service.”\textsuperscript{35}

In its comments, ATIS NRSC also recommended that the Commission use its current outage reporting structure as a model for the filing of interconnected VOIP and broadband ISP outage reports. However, the NRSC suggested changes to this structure to reflect more reasonable deadlines for both existing and any new reporting obligations. For interconnected VoIP service providers, as well as service providers subject to the existing reporting rules, ATIS

\textsuperscript{31} Comments of ATIS at pp 13-15.
\textsuperscript{32} Comments of AT&T at p. 27.
\textsuperscript{33} Comments of Level 3 at p. 3.
\textsuperscript{34} Comments of TWC at p. 5 (emphasis in original).
\textsuperscript{35} Comments of Sprint Nextel at p. 6.
NRSC recommended the submission of: (1) an electronic Notification within 240 minutes of discovering an outage meeting the thresholds above; (2) an Initial Communications Outage Report within three business days of filing a Notification; and (3) a Final Communications Outage Report within thirty days of filing a Notification. For broadband ISPs affecting access, metro or national regions, the NRSC recommended a two-tiered process under which: (1) an electronic Notification would be required within 240 minutes of discovering an outage; and (2) a Final Communications Outage Report would be required within thirty days of the submission of a Notification. 36

ATIS notes also that many commenters support ATIS’ position that the current deadlines for the filing of outage Notifications are not reasonable. AT&T notes that the existing 120-minute notification requirement is unnecessarily burdensome and disruptive. 37 CTIA—The Wireless Association notes that “the short deadlines and penalties associated with insufficient and/or late filings create strong incentives to file inaccurate and even unnecessary information, rather than to wait until the provider can file accurate, verified information concerning service outages.” 38 Verizon correctly notes that, “[i]f the Commission had a more reasonable reporting threshold, withdrawn reports would be virtually eliminated, and the Commission would not have to devote resources to examine reports of events that do not meet the Commission’s thresholds, which are already too low.” 39

36 Comments at ATIS at p. 13, p. 15.
37 Comments of AT&T at p. 21.
38 Comments of CTIA at p. 11.
39 Comments of Verizon at p. 16.
D. **There is Strong Opposition to the Adoption of the Commission’s Proposed Performance Criteria**

In its comments, ATIS raised significant concerns with the Commission’s proposal to require outage reporting based on performance metrics such as packet loss, latency or jitter. ATIS noted that reporting on such data would not necessarily provide a clear indication as to whether an event significantly degrades the ability of an end user to establish and maintain communications, nor is such data monitored or collected by all carriers in a similar manner that is suitable for consistent outage reporting.\(^{(40)}\)

The majority of commenters share ATIS’ concerns regarding the reporting of performance data. CenturyLink states that defining an outage on the basis of performance-based metrics is “misguided,” “impractical” and “extremely costly” to implement nationwide.\(^{(41)}\) AT&T notes that “[a]ccess ISP providers do not track the metrics defined in the IETF standards and do not consider any alleged degradation of service based on them as a cause for analysis.”\(^{(42)}\) ACA states that most of its members typically do not have monitoring equipment deployed deep enough into their networks to meet the proposed metrics.\(^{(43)}\) Comcast Corporation (Comcast) similarly reports that the proposed outage reporting requirements “seek far more information than network operators typically collect on a regular basis, or would force network operators to

\(^{(40)}\) Comments of ATIS at pp. 11-12.
\(^{(41)}\) Comments of CenturyLink at pp. 6-7.
\(^{(42)}\) Comments of AT&T at pp. 25-26.
\(^{(43)}\) Comments of ACA at p. 9.
change existing operational parameters to review data in totally different ways, and, in so doing, would impose substantial and unnecessary new costs and burdens on network operators.”

Commenters also identified that there would be significant costs associated with implementing systems and processes necessary to comply with proposed reporting rules based on the performance criteria. Verizon notes that “adopting quality of service thresholds would impose considerable costs on providers as providers would have to install probes throughout their entire network to run these tests every five minutes, which themselves could cause network congestion.” And, as CTIA – The Wireless Association correctly notes in its comments, it is consumers who will ultimately bear the increased costs associated with the proposed rules to measure quality of service.

MetroPCS Communications, Inc. (MetroPCS) states that the performance metrics “bear little resemblance to broadband reality” and notes that “[r]egularly meeting these standards will be nearly impossible for many service providers, particularly mobile wireless service providers, meaning that regular operation of these networks will suddenly be considered “outages” under the proposed rules.” USTelecom notes that the proposed metrics “would capture many instances that are not actually service outages, and would ultimately cloud stakeholders’ perceptions with a voluminous amount of inaccurate data, which may inaccurately represent the true health of broadband networks.” The Voice on the Net Coalition (VON) and T-Mobile agree in their respective comments that the Commission’s proposed rules could result in VoIP

---

44 Comments of Comcast at pp. 6-7.
45 Comments of Verizon at pp. 21-22.
46 Comments of CTIA-The Wireless Association at p. 9.
47 Comments of MetroPCS at p. 12.
48 Comments of USTelecom at p. 7.
providers essentially being perpetually in a state of outage even though consumers would retain the ability to communicate and utilize their VoIP and broadband services.\textsuperscript{49}

The adoption of performance criteria may also stifle innovation. Comcast notes that “adopting fixed quality-of-service thresholds would bind the rules to today’s technological standards, exposing them to the risk of being outdated if superior compression capabilities were to emerge, and potentially even hindering the development of such technologies.”\textsuperscript{50} Verizon agrees and suggests that the proposed rules would “stifle such innovation by requiring all providers to undertake the same approach to track Commission-mandated service quality criteria.”\textsuperscript{51}

E. Outage Reporting Data Must Remain Confidential

Among the issues on which comment is being sought in the \textit{NPRM} is whether any new outage reporting data should be protected as confidential. ATIS notes that there is strong support for such protection and believes that the Commission must protect as confidential any data provided under its existing or future outage reporting requirements.\textsuperscript{52}

The Commission also seeks comment on whether outage data collected pursuant to NORS should be shared with other Federal agencies on a confidential basis and some commenters have raised the separate issue of whether the Commission should share NORS data

\footnotesize{\textsuperscript{49} Comments of T-Mobile at pp. 11-12, Comments of VON at p. 9.  
\textsuperscript{50} Comments of Comcast at p. 4.  
\textsuperscript{51} Comments of Verizon at p. 22.  
\textsuperscript{52} See, \textit{e.g.}, Comments of AT&T at p. 22, Comments of CenturyLink at p. 22, Initial Comments of the New York Public Service Commission (NYPSC) at p. 7, Comments of the Telecommunications Industry Association at p. 11, and Comments of T-Mobile at p. 12.}
with state agencies. ATIS notes that this issue is the subject of a separate rulemaking and urges the Commission to consider the comments made by ATIS in that rulemaking.

ATIS believes the same restrictions on access to NORS data should apply, regardless of whether the data pertains to the PSTN or to broadband networks. Therefore, ATIS reiterates that strict safeguards must be in place before the sharing of NORS data could be permitted. These include: password protection; the classification by states of outage data as confidential; certifications regarding state protection of outage data; limitations on access to data; and limitations on data use. ATIS also urges that, if state access is provided, it should be provided only to those states: (1) with consistent reporting obligations that agree to abide by the confidentiality and other restrictions established by the Commission pertaining to this data; or (2) without reporting regulations that agree to abide by the confidentiality and other restrictions established by the Commission pertaining to this data.

II. The Commission Should Streamline its Existing Outage Reporting Rules

ATIS, in its comments, strongly urged the Commission to consider whether there are opportunities to streamline its existing outage reporting obligations as part of its inquiry into the need for, and costs of, any new reporting rules. ATIS noted, as it has in other proceedings, that certain types of outages, such as those that impact less than three DS3’s, copper cables, or pair

53 See Comments of Massachusetts Department of Telecommunications and Cable at p.9, Comments of NYPSC at p. 8.
55 Id.
56 Id. at p. 5. ATIS notes the need for safeguards surrounding NORS data is supported by the comments of the NYPSC (Comments of NYPSC at p. 8).
gain systems, could be reported in a more reasonable timeframe, such as via a monthly or quarterly electronic report.

ATIS notes that there is support for the streamlining of the existing outage reporting obligations among commenters. Comcast explains that the threshold for outages affecting DS3 minutes is outmoded in light of the significantly increased capacity of advanced networks, and recommends that the Commission modify it accordingly. T-Mobile notes that, “[b]efore transposing its legacy outage reporting regime onto new and rapidly evolving broadband services, the Commission should carefully consider that the existing Part 4 reporting requirements are much more burdensome than the Commission originally intended.”

57 Comments of Comcast at p. 3.
58 Comments of T-Mobile at p. 7.
III. Conclusion

As noted above, ATIS NRSC strongly believes that there is no need for the Commission to adopt new reporting requirements for interconnected VoIP providers or broadband ISPs and suggests that voluntary collaborative efforts are more effective than regulatory mandates. The NRSC also urges the Commission to ensure that any metrics and deadlines for outage reporting by interconnected VoIP and broadband ISPs are reasonable. In particular, ATIS urges the Commission to define an “outage” in the context of such reporting to mean a total loss of service. Finally, ATIS strongly urges the Commission to protect as confidential any data provided under its existing or future outage reporting requirements and to consider whether there are opportunities to streamline its existing outage reporting obligations.

Respectfully submitted,

Alliance for Telecommunications Industry Solutions

By:

Thomas Goode
General Counsel

Dated: October 7, 2011