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ATTACHMENT A, DECLARATION OF THOMAS K. MCINERNEY

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

In the Matter of)	
)	
Improving Outage Reporting for Submarine Cables)	GN Docket No. 15-206
And Enhancing Submarine Cable Outage Data)	

COMMENTS OF AT&T SERVICES INC.

AT&T Services Inc., on behalf of its affiliates, (“AT&T”) submits the following comments in response to the Notice of Proposed Rulemaking in the above-referenced proceeding.¹

SUMMARY

The Notice states (¶ 2) that to promote the public interest and U.S. economic and national security, and to fill gaps in the sufficiency of the outage information currently supplied by operators, the Commission requires the ability, among other things, to “be advised of undersea cable outages when they occur” and to “receive the information necessary to understand the nature of the damage and potential impacts on critical U.S. economic sectors, national security and other vital interests.” AT&T supports these objectives and is pleased to provide these

¹ Notice of Proposed Rulemaking, FCC 15-119 (rel. Sept. 18, 2015) (“Notice”). The Notice proposes to require submarine cable licensees to report submarine cable outages in the Commission’s Network Outage Reporting System (NORS). Reportable outages would be those in which connectivity in either the transmit mode or the receive mode was lost for at least 30 minutes, or in which fifty percent or more of the capacity of the cable in either the receive mode or transmit mode was lost for at least 30 minutes. The notification would be due within two hours of determining that an event was reportable; the interim report would be due within two hours of scheduling the repair, and the final report would be due seven days after completion of the repair.

comments regarding this proposed new reporting requirement.² In particular, the different business arrangements and other circumstances that apply to many submarine cables serving U.S. international and domestic routes would make implementation of the proposed rules difficult and lengthy and entail costs far in excess of those described therein. The Commission should address these limitations by providing sufficient transition time for the implementation of the necessary arrangements and the deployment of systems to allow the timely reporting of outage information. The Commission also should revise certain other aspects of these proposed requirements to facilitate this reporting.

A critical requirement would be adequate transition time. The large majority of the submarine cables operated by AT&T on U.S. international and domestic routes are consortium cables jointly-owned by many U.S. and foreign operators. Most of these cables were built in the 1990's and are not equipped with systems that may assist in compliance with the proposed requirements. AT&T and other licensees on these cables therefore would need to work with the foreign operator members of these consortiums to put in place the necessary procedures and systems to make these reports, which AT&T estimates would take at least 15 months. The Commission accordingly should provide a transition period of 15 months to allow AT&T and the other licensees of these consortium cables to complete this work before reports were required to be filed.

AT&T supports the proposal to allow licensees of consortium cables to mutually agree on a responsible licensee to make these reports, and also supports the proposal that all licensees

² AT&T has voluntarily provided submarine cable outage information to the Commission since 2008 relating to those consortium cables with agreements that allow such disclosure. *See* Declaration of Thomas K. McInerney at Attachment A ("McInerney Dec."), ¶ 7.

should have a continuing duty to ensure proper reporting. This shared responsibility would provide consortium cable licensees with a common incentive to work with each other and the other members of the consortiums to establish and implement the procedures and systems necessary to provide these reports. The Commission also should modify the proposed requirements in the ways described below to facilitate the timely reporting of outage information by licensees.

First, to allow reportable outages to be more readily identified, a reportable loss of capacity should be defined as the loss of any fiber pair on a cable segment. This proposed threshold would approximate to 50 percent or less of the capacity on most cables, but would not require the reporting licensee to make difficult calculations on cables with different capacities on each segment or fiber pair, or to canvass other capacity owners to determine a total lost capacity amount, as may be required under the proposed approach. Similarly, to allow the ready identification of reportable outages, reportable connectivity losses should be limited to losses of connectivity in either the transmit mode or the receive mode for at least 30 minutes that are caused by failures or breaks in the undersea cable or power failures.

Second, the outage notification should not require a description of the root cause of an outage, which is very rarely known at this early stage. For the location of the outage, the Commission should make clear that the notification is seeking a best estimate of the approximate location of the outage that could be supplemented with more precise location information when it is received from the landing party responsible for the repair.

Third, the deadline to file an interim report should be set at no sooner than within 72 hours of receiving the Plan of Work for the cable repair, which provides more detailed information about repair times. This alternative threshold would allow the reporting licensee to

review the Plan of Work and clarify any issues with the landing party responsible for the repair. The licensee would then be able to provide more complete and useful information in the interim report.

Fourth, the final report should allow for root cause reporting to be optional to the extent that it is not yet available at the time of its filing, and licensees should be permitted to supplement the report as necessary.

I. BACKGROUND

AT&T shares the view of the Commission regarding the importance of submarine cables in today's interconnected world. AT&T and other U.S. telecom carriers operate vast undersea cable networks providing many alternative routes to virtually every country. These cables carry almost all U.S. Internet and voice and data telecommunications traffic outside North America, as well as government and military communications. AT&T has interests in over 80 submarine cable systems covering more than 425,000 fiber route miles. These include 18 submarine cables that link the U.S. to foreign points or that serve domestic U.S. points.³

The large majority of the U.S.-licensed cables operated by AT&T are consortium cables, which are jointly-owned cables in which U.S. and foreign operators share the substantial costs of constructing and operating these cables and which therefore provide the lowest cost method for operators to own long-term capacity to provide services. AT&T is a U.S. landing party and maintenance authority for eleven international consortium cables linking the United States with countries in Central and Latin America, Europe and Asia. As a U.S. landing party, AT&T manages and operates one or more U.S. cable stations at which the undersea cable is linked to

³ McInerney Dec., ¶ 3.

U.S. terrestrial networks.⁴

On all of these consortium cables, foreign operators who are also members of these consortiums are the landing parties at the foreign landing points. Many of these cables have multiple segments linking different foreign landing points. For example, on the MAYA-1 Cable System, which links U.S. points with destinations in Central and Latin America, AT&T is the U.S. landing party operating the U.S. cable station for the cable in Florida, and foreign operator consortium members operate the landing stations in the Cayman Islands, Colombia, Costa Rica, Honduras, Mexico and Panama.⁵

Submarine cables are subject to damage by ship anchors, commercial fishing activities, natural events such as earthquakes, and other causes.⁶ Operators take numerous precautions in selecting cable routes and maximize diversity among cables to minimize the risk of multiple failures, and maintain cable awareness programs, but despite these efforts the above threats may periodically result in cable failures.⁷ Notably, however, most such failures do not disrupt customer traffic. AT&T and other operators today generally use “mesh” network restoration that uses connections between multiple cables to automatically and instantaneously re-route traffic to

⁴ McInerney Dec., ¶ 4.

⁵ *Id.* See also, *AT&T Corp. et al., Joint Application for a License to Land and Operate a Digital Submarine Cable System between the United States, the Cayman Islands, Colombia, Costa Rica, Honduras, Mexico and Panama, the MAYA-1 Cable Network*, 14 FCC Rcd. 19456 (1999).

⁶ McInerney Dec., ¶ 5. See also, CSRIC, Working Group 8, Submarine Cable Routing and Landing, Final Report – Protection of Submarine Cables Through Spatial Separation, Dec. 2014 (“CSRIC Report”), at 5-7.

https://transition.fcc.gov/pshs/advisory/csric4/CSRIC_IV_WG8_Report1_3Dec2014.pdf.

⁷ Industry data show that, on average since 1990, there have been 120 undersea faults each year in all operators’ submarine cables worldwide, with only two undersea faults occurring on average each year in submarine cables located within 200 miles of the U.S. coastline, including U.S. territories. McInerney Dec., ¶ 5.

the next best path when a failure occurs. Additionally, some cables are constructed as “ring” systems that automatically switch traffic to the other side of the ring in the event of a failure. As a result of these and other methods to ensure service reliability, cable failures normally have no material impact on AT&T’s service availability. There are some exceptions, as in March 2011 when earthquakes near Japan and Taiwan led to near-contemporaneous faults in six cable networks, but even in these instances most of AT&T’s traffic was quickly restored by using other cable paths.⁸

On consortium cables with single paths, one landing party in each country is normally designated as the maintenance authority responsible for operating and maintaining the undersea cable in the segment of the cable served by the cable station (usually to a designated point with the other portion of the segment being maintained by the landing party at other end of the segment). The landing party/maintenance authority (referred to hereafter as the “landing party”) has full visibility of the segment of the cable landing at the landing party’s station using a Network Management System (NMS) and is responsible for handling any necessary cable repairs in its designated portion of this segment. On identifying a fault in this section, the responsible landing party takes any necessary action to re-route or restore traffic as provided through consortium agreements or the cable system technology. The landing party also provides notification to other cable owners, makes specific tests to determine additional information about the fault with the other maintenance authority on the affected segment of the cable, and proceeds

⁸ McInerney Dec., ¶ 6.

to make or schedule the necessary repair depending on the location and severity of the fault, and the availability of a repair ship if required.⁹

Some consortium cables have a Network Operations Center (NOC) that provides the NOC operator with visibility into all segments of the cable and uses separate circuits external to the cable to maintain network visibility in the event of a major fault. However, older consortium cables, including the large majority of consortium cables for which AT&T is a U.S. landing party, which were built in the 1990's, were not constructed with NOCs and lack the separate circuit arrangements and central control points that are required for NOC operations. In the event of an outage on a consortium cable segment linking two foreign points, the only segments of the cable that are visible to a U.S. landing party without access to a NOC or other separate paths unaffected by the outage are the segments landing at the U.S. landing party's cable stations.¹⁰ In such circumstances, a U.S. landing party is dependent on the foreign landing parties for the relevant segment for all information concerning the outage.¹¹

Thus, if an outage on a consortium cable segment managed by a foreign consortium party does not cause a disruption to AT&T's services, AT&T may not become aware of the cable outage until notification is received from the foreign consortium party.¹² Further, in AT&T's experience, most notifications of outages provided by foreign consortium parties are not received

⁹ *McInerney Dec.*, ¶ 8.

¹⁰ *Id.*, ¶ 9.

¹¹ *Id.*

¹² *Id.*, ¶ 10.

within two hours of the cable failure.¹³ In recent years, the average interval between the time of the failure and the receipt of these reports has been eight hours.¹⁴

Licensees of consortium cables, therefore, would need to implement extensive new procedures and systems to expedite the provision of the outage information to meet the proposed two-hour period to file an outage notification.¹⁵ These and the other steps that would need to be taken to allow AT&T and the other licensees of these consortium cables to comply with the proposed new outage reporting requirement are described below.

II. THE COMMISSION SHOULD REQUIRE DESIGNATION OF A RESPONSIBLE LICENSEE WITH A CONTINUED DUTY OF ALL LICENSEES OF CONSORTIUM CABLES TO ENSURE PROPER REPORTING

AT&T agrees with the proposal that the licensees on each consortium cable should identify a responsible licensee to file outage reports on behalf of the cable and should have a continued duty to ensure proper reporting. Notice, ¶ 27. Such shared responsibility would encourage the consortium licensees to work together to establish the arrangements with other consortium parties that would be required to obtain the information for these reports on a timely basis.

Requiring the licensees on each consortium cable to determine which licensee should file outage reports for the cable would allow the consortium cable licensees to identify a mutually agreed responsible licensee based on the relevant facts specific to each cable, such as whether

¹³ McInerney Dec., ¶ 10.

¹⁴ *Id.* The reasons for this time period may include such factors as that few foreign landing parties operate cable stations on a seven-day, 24-hour basis, and that their personnel may initially focus on service rerouting or restoration rather than notifying consortium partners. Indeed, the longstanding priority of submarine cable operators in the event of a cable fault or failure has been to ensure the restoration of service to customers. *Id.*

one licensee may be better placed to make these reports than other licensees. Such a licensee may be a U.S. landing party able to directly access the cable segment landing at the U.S. cable station or in a few instances may have access to other segments of the cable as the operator of a Network Operations Center. Since the licensees themselves would be best placed to assess the importance of such circumstances on each consortium cable they should be required to make this determination.

All licensees also should have a continued duty to ensure proper reporting. As previously noted, the licensees of most consortium cables are dependent on foreign landing parties to provide information on outages on cable segments that link two foreign points. Thus, the licensees would need to work with the consortiums to establish the procedures or new systems necessary to ensure that the responsible licensee is able to obtain the necessary information from the foreign landing parties in the consortium to file the outage reports.¹⁶ The efforts by the responsible licensee in this regard would be greatly assisted by the active participation of all licensees in working with the other consortium members.¹⁷ The existence of a shared duty by the licensees on each consortium cable to ensure proper reporting, and their joint liability in the event of an enforcement action, as suggested by the Notice (§ 29), would promote such cooperation.¹⁸ These joint efforts of the U.S. licensees also would be supported by the

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¹⁵ McInerney Dec., ¶ 10-11.

¹⁶ *Id.*, ¶ 12.

¹⁷ *Id.*

¹⁸ While any liability should be joint, a better approach would be not to subject licensees to potential enforcement action for this proposed reporting. As noted by Commissioner O'Reilly, such liability may lead licensees to undertake legal reviews before submitting these reports,

(Footnote continued on next page)

provisions in consortium agreements requiring parties to take necessary actions to ensure the continuation of required licenses and the cost-sharing principles that underpin these agreements.¹⁹

III. A TRANSITION PERIOD WILL BE REQUIRED TO ALLOW LICENSEES AND FOREIGN LANDING PARTIES TO IMPLEMENT THE NECESSARY TECHNOLOGY AND PROCEDURES

The Notice proposes to require the notification of reportable outages within two hours regardless of whether the traffic on the cable is rerouted. This proposed reporting requirement is somewhat analogous to the current FCC reporting of simplex outages, where there also is no adverse impact on service to customers, but would require a significantly shorter proposed timeframe, as FCC simplex reports are not due until five days after the outage occurs. This proposed timeframe also is significantly shorter than the current average interval of eight hours between the time of a cable failure on a consortium cable segment linking two foreign points and the time when AT&T is notified of the failure by the responsible foreign landing party.²⁰ In order to meet this proposed two-hour timeframe, consortium cable licensees would need to

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which could impede their timely submission. *See* Notice, Statement of Commissioner O'Reilly. The initial notification should in particular not be subject to potential enforcement action – especially if the report remains due in two hours. As described, the two-hour timeframe is far shorter than the period in which U.S. licensees may currently learn of non-service affecting outages on foreign segments of consortium cables and would potentially require information from foreign landing station personnel thousands of miles away who would already be fully engaged in addressing the myriad other tasks that may arise in the event of an outage. At a minimum, the Commission should not subject licensees to potential enforcement until licensees have had an additional twelve months beyond the requested transition period to ensure that new systems and procedures implemented to provide these reports would be functioning properly.

¹⁹ McInerney Dec., ¶ 12.

²⁰ *Id.*, ¶ 10.

undertake significant work with the other members of each consortium to develop an agreed approach to provide these reports and then would need to design and implement the necessary procedures and technologies.²¹ The small number of consortium cables with Network Operations Centers or other systems that may assist to some extent in providing information for these reports also likely would require the development of additional processes and procedures for this purpose.²² Moreover, as noted, most of the consortium cables on which AT&T is a U.S. landing party are older cables without these systems and on which U.S. licensees currently have little or no visibility into foreign segments in the event of outages.

One approach would be to use reporting centers staffed on a seven day, 24 hour basis and linked to the Network Management System at each U.S. and foreign landing point of the relevant cable over separate circuits to provide continued connectivity in the event of an outage on the cable. Such reporting centers do not presently exist and would need to be designed and constructed and the required circuit links installed. Alternatively, manual procedures could be used to obtain information which would likely require significant staffing increases at cable stations.²³

First, the licensees on each cable would need to determine which licensee was best placed to make these reports. Next, as previously noted, the responsible licensee, in conjunction with the other licensees, would need to work with the relevant consortium committees to obtain agreement on the approach to be followed. Because each of the different cable consortiums includes as many as fifty operators from countries throughout the world, the development of a

²¹ *McInerney Dec.*, ¶¶ 11-12.

²² *Id.*, ¶ 11.

consensus approach in each consortium likely would be time-consuming.²⁴ The responsible licensee and the foreign landing parties then would need to implement the necessary technology and procedures to make these reports. Further, just on the consortium cables for which AT&T is a U.S. landing party and maintenance authority, the required expense to implement and operate the necessary procedures and technology would likely be hundreds of times greater than the “conservative” estimate set forth in the Notice of \$8000 per year for the entire industry.²⁵ See ¶ 44.

AT&T anticipates that completion of these necessary steps would require at least 15 months after the release of the Commission’s final order in this proceeding.²⁶ Accordingly, to allow for the completion of this process, the Commission should allow a transition period of 15 months following the effective date of the final order and should delay the commencement of reporting until this transition period is complete.

Even following the implementation of new procedures or technologies to make these reports, it likely still would be very difficult for licensees on consortium cables to meet a requirement to file outage notifications within two hours, especially if reportable outages were difficult to identify in the wide variety of capacity and facility arrangements that apply to submarine cables, or where cooperation between different landing parties or testing work by a

(Footnote continued from previous page)

²³ McInerney Dec., ¶ 11.

²⁴ *Id.*, ¶ 12.

²⁵ *Id.*, ¶ 13.

²⁶ *Id.*

landing party was required to obtain the necessary information.²⁷ The Commission accordingly should apply clear and straightforward definitions of reportable outages and make other modifications in the proposed reports as described below in order to facilitate the proposed reporting.

IV. A REPORTABLE CAPACITY LOSS SHOULD BE DEFINED AS THE LOSS OF ANY FIBER PAIR AND REPORTABLE CONNECTIVITY LOSSES SHOULD BE LIMITED TO FAILURES IN THE UNDERSEA CABLE

The Notice proposes that a reportable outage should be defined as the loss of connectivity in the receive or transmit mode for at least 30 minutes, or the loss of 50 percent or more of the cable's capacity in receive or transmit mode for at least 30 minutes, regardless of whether traffic is re-routed. *See* ¶ 31. However, these thresholds would be difficult or impossible to calculate in many instances. To allow outages comprising significant degradations in capacity to be more readily identified, a reportable capacity loss rather should be defined as the loss of any fiber pair on a cable segment for at least 30 minutes. On most cables, the loss of a fiber pair will entail the loss of 50 percent or less of the capacity of the cable.

Additionally, a reportable connectivity loss should require the loss of all connectivity in the receive or transmit mode, and should be limited to such losses caused by failures or breaks in the undersea cable and power failures. Problems occurring in the terminal equipment at cable stations (other than power failures), which generally have much less effect on the operation of a cable and are more readily repaired, should not be reportable.

²⁷ McInerney Dec., ¶ 14.

1. **A Reportable Capacity Loss Should be the Loss of Any Fiber Pair**

The proposed capacity reporting threshold of loss of 50 percent of a cable's capacity in the receive or transmit mode would be very difficult to calculate in many instances and may even require canvassing other owners of capacity on a cable to determine the total amount of lost capacity. Such a task likely would be impossible to accomplish in a much longer time-frame than the proposed two-hour timeframe for the filing of a Notification, particularly for outages occurring outside normal business hours.²⁸ A multi-segment consortium cable such as the Asia America Gateway Cable linking the U.S. with various destinations in Asia, for example, has different capacities on each segment and fiber pair, which would further complicate this task.²⁹ In addition, the dynamic nature of capacity use, with capacity owners continually activating and deactivating capacity according to their business needs, would make any attempt to track such usage highly burdensome.³⁰

Instead, the Commission's objective of ensuring the reporting of cable outages resulting in significant degradations of capacity would be accomplished by defining a reportable capacity loss as the loss of *any fiber pair on a cable segment*, regardless of the number of fiber pairs that comprise the total capacity of the cable segment.³¹ In many instances, because many cables have two fiber pairs, the loss of one fiber pair would approximate the loss of 50 percent of the total capacity of the cable. For multi-fiber pair cables, the loss of one fiber pair often would comprise

²⁸ McInerney Dec., ¶ 15.

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.*

much less than 50 percent of total capacity.³² However, in all instances, the adoption of this threshold would expedite the identification of a reportable outage and would ensure that all significant cable outages were reported.³³

2. Reportable Connectivity Losses Should be Limited to those on the Undersea Cable and Power Failures

The proposed definition of a connectivity loss as the loss of connectivity in the receive or transmit mode for at least 30 minutes should require the reporting only of complete connectivity losses of this type.³⁴ Thus, reportable connectivity losses should be limited to losses of connectivity in the receive or transmit mode for at least 30 minutes caused by failures or breaks in the optical fiber of the cable (*i.e.*, the undersea cable) and power failures.

Reporting should not be required for card failures or other problems (apart from power failures) affecting terminal equipment at cable stations, which in almost all instances involve the loss of less than 50 percent of the capacity of the cable. Further, all these problems are more readily repaired as such repairs do not involve the use of a repair ship.³⁵ Requiring the reporting of all losses in connectivity, whatever the cause, would require the reporting of large numbers of potential terminal equipment issues that normally do not significantly affect the operation of submarine cables and would greatly increase the difficulty of compliance with the reporting requirement.³⁶

³² McInerney Dec., ¶ 16.

³³ *Id.*

³⁴ *Id.*, ¶ 17.

³⁵ *Id.*

³⁶ *Id.*

Also, the Commission should not adopt any requirement to report other “indications of potential problems” or “potential traffic-impacting/hazardous conditions/impairments,” on which the Notice also seeks comment (¶ 34). It would be unreasonably burdensome to require licensees to apply such vague and ambiguous reporting criteria to the variety of conditions that may arise on a cable, particularly in the proposed two-hour period allowed for the outage notification, subject to potential enforcement penalties in the event of a perceived misjudgment.³⁷

V. ADDITIONAL MODIFICATIONS ARE REQUIRED IN THE OUTAGE REPORTS

Several additional modifications should be made regarding the proposed timing and contents of the outage reports to allow licensees a reasonable opportunity to file in a timely manner. Some information proposed to be included in the notification is unlikely to be available at the early stages of identifying and addressing cable outages, or will unnecessarily delay these reports unless provided as a best estimate. Additionally, the proposed timing of the interim report should be adjusted to encourage the provision of more useful and complete information concerning the status of the cable, consistent with the intended purpose of this report. AT&T’s recommendations to address these concerns are set forth below.

1. The Notification Should Not Require a Description of the Root Cause and Should Allow a Best Estimate of the Approximate Location

The Notice proposes that the Notification should include, among other things, a brief description of the event including the “root cause,” and the approximate location of the event in nautical miles from the nearest cable station or in latitude and longitude. *See* ¶ 37. Yet, it is rarely possible to identify the “root cause” of an outage in an undersea cable at this very early

³⁷ McInerney Dec. ¶ 17.

stage.³⁸ Indeed, this information is not generally known until the completion of the repair, sometimes requires further analysis and laboratory testing after that time, and in some circumstances is never determined.³⁹ To avoid any confusion and delay that may result from requiring the provision of information unlikely to be available, this proposed requirement should be removed.

The proposed requirement for an “approximate location of the event” in nautical miles or latitude and longitude also would greatly increase the difficulty of submitting these reports on a timely basis. The calculation of this information may require testing by the landing party for the affected segment of the cable and/or coordinated work between the landing parties at both ends of the affected cable segment, and this work frequently would not be completed within the two hours available to make these reports.⁴⁰ To facilitate the timely submission of these reports, this information should be allowed to be reported as a best estimate, similar to the proposed requirement for a best estimate of the duration of the event.⁴¹ In many instances, the landing party nearest to the site of the outage likely would be able to provide, on a timely basis, best estimate outage location information that would identify the affected repeater segment on the

³⁸ McInerney Dec., ¶ 18.

³⁹ *Id.*

⁴⁰ *Id.*, ¶ 18.

⁴¹ *Id.* There is also no reason to require the provision of a list of all of the licensees on the cable, as the Notice further proposes. ¶ 37. This information is not usually familiar to the operations personnel who would make these reports, but is already maintained by the Commission. *See, e.g.,* Public Notice, FY 2015 Regulatory Fees, Submarine Cable Systems, Sept. 14, 2015 (identifying the licensees for each cable system); Public Notice, FY 2014 Regulatory Fees, Submarine Cable Systems, Sept. 16, 2014 (same).

cable, which likely would be approximately 50 miles in length.⁴² In some circumstances, the licensee likely would be able to identify only the affected cable segment between two landing stations pending the completion of the landing party work described above.⁴³ However, licensees would be able to supplement the best estimate information to provide more precise approximate outage location when this information was received from the landing party.

2. The Interim Report Should be Required 72 Hours After Receipt of the Plan of Work for the Cable Repair

The proposed timeframe for the interim report to be filed within two hours of the scheduling of the cable repair fails to take account of the fact that licensees of consortium cables are frequently not the consortium parties who schedule cable repairs and therefore such scheduling is frequently outside their control.⁴⁴ See ¶ 38. As previously described, on consortium cables, each landing party is responsible for cable repairs for outages occurring on the cable segment served by the landing party's cable station. Thus, foreign landing parties are responsible for scheduling cable repairs for the outages on the foreign cable segments served by their cable stations and may schedule such repairs at any time of the day or night U.S. time without notice to other consortium parties.⁴⁵

⁴² McInerney Dec., ¶ 18.

⁴³ *Id.* This limitation would likely apply to outages on older cables without functioning line monitoring systems or lacking other relevant technology, and also would likely apply to certain types of failures involving cable branching units and certain optical failures on all cables.

⁴⁴ *Id.*, ¶ 19.

⁴⁵ *Id.* In contrast, filing parties have much more notice of each deadline for the second reports required by the Part 4 reporting requirements for domestic outages, which are Initial reports that are due 72 hours after the discovery of an outage. See 47 C.F.R. Sects. 4.9(a)(4), 4.9(c)(3), 4.9(d), 4.9(e)(5), & 4.9(f)(4).

The Notice inquires whether there are “better points” on the cable outage and repair timeline for the submission of an interim report. *See* ¶ 37. In fact, there are better points in this timeline that would allow licensees to submit interim reports that would provide more complete and useful information to enhance the Commission’s knowledge and assist in its analysis of these events. Consortium licensees generally have “significantly more information about expected repair times” not at the moment when the undersea repair is scheduled, as stated by the Notice (¶ 38), but rather when the landing party responsible for the repair distributes the Plan of Work for the repair to other consortium parties.⁴⁶ To allow the responsible licensee to review the Plan of Work, and to review and clarify any necessary issues with the landing party responsible for the repair, the interim report should be required to be filed within 72 hours of receiving the Plan of Work. This modification would more likely allow licensees to provide the “additional, useful information” that the Commission seeks to obtain from this report. *See* Notice, ¶ 36. The brief interval between the receipt of the information triggering the interim report and the filing deadline proposed by the Notice would be likely to lead to the submission of incomplete or preliminary information that would be much less useful to the Commission.⁴⁷

Additionally, the proposed requirement to provide a description of the “root cause” of the outage in the interim report again would be premature. As previously noted, in almost all instances, this information is not available until repair work is completed or even until

⁴⁶ *McInerney Dec.*, ¶ 19.

⁴⁷ *Id.*

subsequent analysis is undertaken. The interim report either should not include this request or should make clear that this information should be provided only if available.⁴⁸

3. The Final Report Should Allow the Extension of the Deadline Where Information is Not Available

The proposed requirement for a final report filed seven days after the completion of the repair generally would provide sufficient time for the submission of the required information.⁴⁹ Notice, ¶ 39. However, licensees should be able to supplement this information as necessary where the required information is not available within seven days. In some circumstances, such as a delay in the return of the repair ship, additional time may be required to provide certain information required by the report.⁵⁰ Additionally, the repair ship contracts for many U.S. landed cables allow the ship operator up to 30 days to provide a final completion report after finishing the repair.⁵¹ Thus, a licensee may need to supplement the final report to include additional information contained in the final completion report.

To enhance the value of the final report to the Commission's analysis of these events, AT&T also proposes that the Commission modify the final report to include the root cause of the outage only if this information is available at the time that the report is due. The root cause of an outage is generally known by the time a repair is completed, rather than at the earlier stages of the outage that are addressed by the proposed notification and interim reports. Because the identification of the root cause may sometimes require research or laboratory testing after the

⁴⁸ McInerney Dec., ¶ 19.

⁴⁹ *Id.*, ¶ 20.

⁵⁰ *Id.*

⁵¹ *Id.*

repair is complete, and sometimes even then there is no conclusive determination, licensees should be required to provide this information only if available and to supplement the final report as necessary to provide it once it becomes available.⁵²

VI. CABLE OUTAGE REPORTS SHOULD BE PRESUMPTIVELY CONFIDENTIAL

The Notice properly proposes (¶ 41) that cable outage reports will be treated as presumptively confidential pursuant to the Commission's existing rules governing outage reporting. Such treatment would be consistent with the treatment of the cable outage information that is currently provided on a voluntary basis by AT&T and other submarine cable licensees and is supported by compelling public interest concerns, as described by the Notice (¶ 41). The assurance of confidential treatment for this information would also be important for other consortium parties and could be helpful in obtaining their cooperation in providing the necessary information for these reports. A number of consortium agreements require such information to be treated as confidential, and also require consortium parties to request confidential treatment for this information when it is provided to regulators.⁵³ The proposed treatment is consistent with this approach.

VII. THE COMMISSION SHOULD WORK WITH FEDERAL, STATE AND LOCAL AGENCIES TO IMPROVE PROTECTIONS FOR SUBMARINE CABLES

AT&T shares the Commission's views regarding the importance of facilitating the timely deployment and maintenance of submarine cables, the need to address issues that may impede these objectives, and the benefits of encouraging interagency cooperation to assist their achievement. *See* Notice, ¶¶ 45-47. AT&T is also pleased to respond to the request for

⁵² McInerney Dec., ¶ 20.

⁵³ *Id.*, ¶ 21.

comment on further actions the Commission may take or encourage other agencies to take. *See* ¶ 46. In this regard, the CSRIC Report released in December 2014 makes a number of important recommendations to improve protections for submarine cables based on input from a working group and other participants representing both industry and government. The report observes that no federal agency thus far has sought to adopt or enforce standards or policies to protect submarine cables.⁵⁴ The report also notes that Australia, New Zealand, China, Denmark, Indonesia, Japan, Russia, Singapore and the UK have adopted measures such as corridors or protection zones around submarine cables to protect them from anchoring, pipeline installation, dredging, and the use of equipment on the seabed, and other activities that may cause damage to undersea cables.⁵⁵

The report recommends that the Commission and submarine cable operators should work with other U.S. Government agencies to address spatial requirements for submarine cables, and should promote the development and implementation of various measures to protect these cables.⁵⁶ The report urges the Commission to work with other federal, state and local government agencies to promote the creation of exclusions zones around existing cables that would apply to offshore energy facilities in addition to the other activities that may harm submarine cables.⁵⁷ Additional recommendations by the report include that the Commission also should endorse a default separation distance for specific activities in relation to submarine cables, and should recognize existing international standards relating to submarine cable

⁵⁴ CSRIC Report at 11.

⁵⁵ CSRIC Report at 50-53.

⁵⁶ *Id.* at 12.

⁵⁷ *Id.* at 12-13.

protection.⁵⁸ Additionally, the Commission should work with operators and other agencies to develop a standard approach to the dissemination of data concerning the location of submarine cables, and should press for increased civil and criminal penalties for damaging submarine cables.⁵⁹

AT&T supports all these recommendations. As the report emphasizes, the Commission is well-placed as the primary regulator of submarine cables to play a leading role in promoting the need for improved measures and processes to protect this critical infrastructure among other federal, state and local government agencies.⁶⁰ The report also demonstrates that there is a significant need for such improvement.

A further priority to ensure the proper protection of submarine cables is U.S. ratification of the Law of the Sea Convention. The ability to lay, maintain and repair submarine cables outside territorial seas, and particularly the ability to carry out these activities in a timely manner, depends on the effectiveness of international legal protections. Otherwise, for example, restrictions by coastal states may impede the timely repair and maintenance of undersea cables and also may delay the construction of new cables. The United States is one of a handful of countries that have signed, but not ratified, the Law of the Sea Convention, which entered into force in 1994 and currently has 153 nations as parties.

The Convention expands the right to lay and maintain submarine cables in the oceans of the world and provides stronger protections for cables against damage by other parties.⁶¹ In the

⁵⁸ *Id.* at 13.

⁵⁹ *Id.* at 14.

⁶⁰ CSRIC Report at 2.

⁶¹ Articles 58, 79, 100-101, 112-115 and 297 of the Convention have particular relevance to

negotiation of the Convention in the early 1980's, the U.S. was a major proponent of the expanded protections for submarine cables because of the concerns of the U.S. telecom industry. Ratification of the Convention would enable the U.S. to raise claims under the dispute resolution procedures of the Convention in response to actions like the March 2007 destruction of major segments of two submarine cables by fishermen off the coast of Vietnam, restrictions by coastal states impeding the timely maintenance and repair of undersea cables, and efforts by one country

(Footnote continued from previous page)

undersea cables. For example, Articles 58, 79 and 112 guarantee the rights of nations and private parties to lay and maintain submarine cables on the continental shelf, in the Exclusive Economic Zone ("EEZ"), and on the bed of the high seas. Under these provisions, submarine cables have protections equal to the freedom of navigation and superior to other laws which coastal states may seek to impose within their EEZ or upon their Continental Shelf.

to impose taxes on submarine cables transiting its claimed continental shelf. Thus, for example, the U.S. would be able to raise such claims in the event that a country required unreasonably extensive permitting procedures before allowing submarine cable repairs in its Exclusive Economic Zone. The U.S. has less ability to enforce its rights when it seeks to address an issue governed by the Convention and it is not a party to this treaty.

Respectfully submitted,

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Dated: December 3, 2015

ATTACHMENT A

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

In the Matter of)
Improving Outage Reporting for Submarine Cables) GN Docket No. 15-206
And Enhancing Submarine Cable Outage Data)

DECLARATION OF THOMAS K. MCINERNEY

1. My name is Thomas K. McInerney. I am Director, Network Services in the AT&T Technology Operations business unit of AT&T Corp. In this position, I am responsible for operating and maintaining AT&T's submarine cable network in the United States and throughout the world and I have had this responsibility since 2002. My work includes ensuring the proper operation and maintenance of AT&T's 16 cable landing stations in the United States, ensuring the proper operation, repair and maintenance of the 64 submarine cables that AT&T owns or in which AT&T has ownership interests, and the management of AT&T's relationships with the 35 cable consortiums in which AT&T has ownership interests. In my previous position, I spent eight years as responsible for negotiating AT&T consortium cable arrangements with foreign operators, including virtually all the consortium cables that are currently operational and land in AT&T's cable stations. My direct management responsibilities during my 41 years with AT&T have therefore covered all aspects of AT&T's submarine cable operations.

2. The information set forth in this declaration is based on my personal knowledge or provided by employees in my chain of command whom I believe have provided reliable and accurate information.

3. AT&T and other U.S. telecom carriers operate vast undersea cable networks providing

many alternative routes to virtually every country in the world. These cables carry virtually all U.S. Internet and voice and data telecommunications traffic outside North America, as well as government and military communications. AT&T has interests in over 80 submarine cable systems covering more than 425,000 fiber route miles. These include 18 submarine cables that link the US to foreign points or that serve domestic U.S. points.

4. *Consortium cables.* AT&T is a U.S. landing party and maintenance authority for eleven international consortium cables linking the United States with countries in Central and Latin America, Europe and Asia. Consortium cables are jointly-owned cables in which U.S. and foreign operators share the substantial costs of constructing and operating these cables and which therefore provide the lowest cost method for operators to own long-term capacity to provide services. As a U.S. landing party, AT&T manages and operates a U.S. cable station at which the undersea cable is linked to U.S. terrestrial networks. Other U.S. operators are also U.S. landing parties on several of these cables. On all of these consortium cables, foreign operators who are also members of these consortiums are the landing parties at the foreign landing points and perform similar functions. Many of these cables have multiple segments linking different foreign landing points. For example, on the MAYA-1 cable, which links U.S. points with various destinations in Central and Latin America, AT&T is the U.S. landing party operating the U.S. cable station for the cable in Florida, and foreign operator consortium members operate the landing stations in the Cayman Islands, Colombia, Costa Rica, Honduras, Mexico and Panama.

5. *Cable Faults and Outages.* Submarine cables are subject to damage by ship anchors, commercial fishing activities, natural events such as earthquakes, and other causes. Operators take numerous precautions in selecting cable routes and maximize diversity among cables to

minimize the risk of multiple failures, and maintain cable awareness programs, but despite these efforts the above threats may periodically result in cable failures. Industry data show that since 1990 there have been, on average, 120 faults each year in all operators' submarine cables worldwide. During this 25-year period, the average number of undersea faults each year occurring in submarine cables located within 200 nautical miles of the U.S. coastline, including U.S. territories, has been less than two.

6. Most submarine cable failures do not disrupt customer traffic. AT&T and other operators today generally use several methods to ensure service reliability, including "mesh" network restoration that uses connection between multiple cables to automatically and instantaneously re-route traffic to the next best path when a failure occurs. Additionally, some cables are constructed as "ring" systems that automatically switch traffic to the other side of the ring in the event of a failure. As a result, cable failures normally have no material impact on AT&T's services. There are some exceptions, as in March 2011 when earthquakes near Japan and Taiwan led to near-contemporaneous faults in six cable networks, but even in these instances most AT&T traffic was quickly restored by using other cable paths.

7. Since 2008, in response to a request by the FCC International Bureau, AT&T has voluntarily provided the FCC's Public Safety and Homeland Security Bureau and/or the International Bureau with copies of the system status and restoration reports that are sent to consortium partners in the normal course of business for those consortium cables with consortium agreements that allow such disclosure. This information has been provided subject to the understanding that all information is to be treated as confidential and exempt from disclosure.

8. *Consortium Cable Maintenance Responsibilities.* On consortium cables with a single landing in a country, the landing party in that country is normally designated as the maintenance authority responsible for operating and maintaining the undersea cable in the segment of the cable served by the cable station (usually to a designated point with the other portion of the segment being maintained by the landing party at other end of the segment). The landing party/maintenance authority (hereafter referred to as the “landing party”) has full visibility of the segment of the cable landing at the landing party’s station using a Network Management System (NMS) and is responsible for managing any necessary cable repairs in its designated portion of this segment. On identifying a fault in this section, the responsible landing party takes any necessary action to re-route or restore traffic as provided through consortium agreements or the cable system technology, provides notification to other cable owners, makes specific tests to determine additional information about the fault with the other maintenance authority on the affected segment of the cable, and proceeds to make or schedule the necessary repair depending on the location, severity, and availability of a repair ship if required. AT&T performs these functions as the U.S. maintenance authority on 13 of the consortium cables that land at AT&T’s cable stations.

9. Some consortium cables have a Network Operations Center (NOC) that provides the NOC operator with visibility into all segments of the cable and uses separate circuits external to the cable to maintain network visibility in the event of a major fault. However, older consortium cables, including the large majority of consortium cables for which AT&T is a U.S. landing party, which were built in the 1990’s, were not constructed with NOCs and lack the separate circuit arrangements and central control points that are required for NOC operations. In the event of an outage on a consortium cable segment linking two foreign points, the only segments

of the cable that are visible to a U.S. landing party without access to a NOC or other separate paths unaffected by the outage are the segments landing at the U.S. landing party's cable stations. In such circumstances, a U.S. landing party is dependent on the foreign landing parties for the relevant segment for all information concerning the outage.

10. Currently, most notifications of the occurrence of outages on consortium cables that AT&T receives from foreign consortium parties are not provided within two hours of the cable failure. Indeed, the average interval between the time of the cable failure and the receipt of these reports in recent years has been about eight hours. The reasons for this time period may include such factors as that few foreign landing parties operate cable stations on a seven-day, 24-hour basis, and that their personnel may initially focus on service rerouting or restoration rather than notifying consortium partners. In this regard, the longstanding priority of submarine cable operators in the event of a cable fault or failure has been to ensure the restoration of service to customers. As previously noted, AT&T's services are rarely affected by cable outages because they are automatically protected by AT&T's mesh network and other network redundancy. In the event of a disruption to AT&T's services as the result of a cable fault in a consortium cable segment managed by foreign consortium parties where AT&T does not receive sufficient information on a timely basis, AT&T takes immediate steps to contact those parties to obtain this information and ensure that all necessary action is being undertaken to address the issue. However, if an outage on a segment of a consortium cable managed by a foreign consortium party does not cause any disruption to AT&T's services, AT&T may not become aware of the cable outage until notification is received from the foreign consortium party.

11. *The Proposed Outage Notification.* The Notice proposes to require the notification of reportable outages within two hours regardless of whether the traffic on the cable is rerouted. This proposed reporting requirement is somewhat analogous to the current FCC reporting of simplex outages, where there is also no adverse impact on service to customer, but under a significantly shorter proposed timeframe, as FCC simplex reports are not due until five days after the outage occurs. In order to meet this proposed timeframe, consortium parties would need to undertake significant efforts. One approach would be to use reporting centers staffed on a seven day, 24 hour basis and linked to the network management system at each U.S. and foreign landing point of the relevant cable over separate circuits to provide continued connectivity in the event of an outage on the cable. Such reporting centers do not presently exist and would need to be designed and constructed and the required circuit links installed. Alternatively, manual procedures could be used to obtain information which would likely require significant staffing increases at cable stations. The small number of consortium cables with Network Operations Centers or other systems that may assist to some extent in providing information for these reports also likely would require the development of additional processes and procedures for this purpose.

12. Significant efforts therefore would be required to implement the proposed reporting requirements on the part of AT&T and the other licensees of consortium cables landing in the U.S. On each consortium cable, the licensees would need to work with the other consortium members and particularly the foreign landing parties to establish the systems or other procedures to provide the required information. This would require working with the relevant consortium committees to obtain agreement on the approach to be followed. Since the different cable

consortiums may include as many as fifty operators from countries throughout the world, the development of a consensus approach in all the relevant consortiums would likely be time-consuming. These efforts would be greatly assisted by the active participation of all licensees in addition to the licensee designated to make the outage reports. The other U.S. licensees in each consortium would potentially play an important role in this process by working to emphasize the importance of this issue with other consortium members. The licensees' joint efforts to obtain the agreement of the other consortium members to take the steps necessary to make these reports would also be supported by the provisions in consortium agreements requiring all consortium parties to take necessary actions to ensure the continuation of required licenses and the cost-sharing principles that underpin these agreements.

13. The period required for the licensees of consortium cables to undertake this work with the consortiums and to implement the necessary procedures and technology likely would be at least 15 months. Further, just for the consortium cables for which AT&T is a U.S. landing party and maintenance authority, the required expense to implement and operate the necessary procedures and technology to make these reports would likely be hundreds of times greater than the estimate set forth in the Notice of \$8000 per year for the entire industry.

14. Even following the implementation of new procedures or technologies to make these reports, it likely would be difficult for licensees on consortium cables to meet a requirement to file timely notifications as proposed by the Notice, especially if reportable outages were difficult to identify in the wide variety of capacity and facility arrangements that apply to these cables, or where cooperation between different landing parties or testing work by a landing party was required to obtain necessary information. The Commission accordingly should apply clear and

straightforward definitions of reportable outages and make other modifications in the proposed reports as described in the following paragraphs in order to facilitate the proposed reporting.

15. *Reportable Outages.* The proposed capacity reporting threshold of loss of 50 percent of a cable's capacity in the receive or transmit mode would be very difficult to calculate in many instances. Such a task may even require canvassing other owners of capacity on a cable to determine the total amount of lost capacity, which likely would be impossible to accomplish in the proposed two-hour timeframe for the filing of a Notification, particularly for outages occurring outside normal business hours when other capacity owners may not have staff available for this purpose. A consortium cable such as the Asia America Gateway Cable linking the U.S. to various destinations in Asia, for example, has different capacities on each segment and fiber pair, which would further complicate this task. Further, because service carrying capacity on cables is dynamic, with individual capacity owners activating and deactivating service on their capacity as required by their business needs, tracking current capacities on each cable to facilitate the identification of a 50 percent threshold would be highly burdensome.

16. The objective of ensuring the reporting of cable outages resulting in significant degradations of capacity instead may be accomplished by defining a reportable capacity loss as the loss of *any fiber pair on a cable segment*, regardless of the number of fiber pairs that comprise the total capacity of the cable segment. In many instances, since many cables are two fiber pair cables, the loss of one fiber pair would approximate the loss of 50 percent of the total capacity of the cable. For multi-fiber pair cables, the loss of one fiber pair would comprise much less than 50 percent of total capacity. In all instances, the adoption of this threshold would

facilitate the ready identification of reportable outages and would ensure that all significant cable outages were reported.

17. The Notice proposes to define a reportable connectivity loss as the loss of connectivity in the receive or transmit mode for at least 30 minutes, which should only require reporting of complete connectivity losses of this type. However, to facilitate the ready identification of reportable outages, reportable connectivity losses should be limited to losses of connectivity in the receive or transmit mode for at least 30 minutes caused by failures or breaks in the optical fiber pairs of the cable (*i.e.*, the undersea cable) or power failures. Reporting should not be required for card failures or other problems (apart from power failures) affecting terminal equipment at cable stations that in almost every case involve traffic degradations under 50 percent of the capacity of the cable, and all of which are more readily repaired, as such repairs do not involve the use of a repair ship. Requiring the reporting of all losses in connectivity however caused would require the reporting of large numbers of potential terminal equipment issues that normally do not significantly affect the operation of submarine cables and would greatly increase the difficulty of compliance with the reporting requirement. Requiring the reporting of “indications of potential problems” or “potential traffic-impacting/hazardous conditions/impairments” would also greatly increase the difficulty of compliance. Such vague criteria would be exceptionally difficult to apply to the variety of conditions that may arise on a cable, particularly in the proposed two-hour period allowed for the outage notification.

18. *Required Information.* The proposed outage reports include requirements for information that is not normally available or known to U.S. landing parties in the proposed timeframes for these reports. First, the “root cause” of an outage in an undersea cable can very rarely be

identified until the completion of the repair and sometimes requires further analysis and laboratory testing after then. The identification of a root cause therefore should not be required until the final report stage and even then the reporting party should be allowed to defer the provision of this information if it is still not available. Second, the calculation of an “approximate location of the event” in nautical miles or latitude and longitude may require testing work by one or both landing parties for the affected cable segment that frequently would not be completed within the proposed two-hour period for the submission of the outage notification. The licensee therefore should be allowed to report the location of the outage as a best estimate reflecting the information available to the licensee at the time of the notification, similar to the proposed requirement for a best estimate of the duration of the event. In many instances, the landing party nearest to the site of the outage would likely be able to provide a best estimate location comprising the relevant repeater segment on the cable (which generally are no more than 50 miles in length). For outages on older cables without functioning line monitoring systems or lacking other relevant technology, and for certain types of failures involving cable branching units, and certain optical failures on all cables, the identification of an outage location within the affected cable segment may require circuit testing by one or both landing parties. In such circumstances, the licensee likely would be unable to provide best estimate location information more precise than the relevant cable segment linking two landing stations. However, licensees would be able to supplement the notification to provide more precise outage location information when it was available.

19. *Interim Report.* The Notice proposes to require an interim report to be filed within two hours of the scheduling of the cable repair. However, licensees of consortium cables are frequently not the consortium parties who schedule cable repairs. On consortium cables, foreign

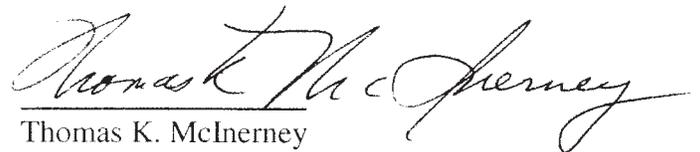
landing parties are responsible for scheduling cable repairs for the outages on the cable segments served by their cable stations and may schedule such repairs at any time of the day or night U.S. time without notice to other consortium parties. Moreover, the time when licensees generally have significantly more information about expected repair times is not when the repair is scheduled, but when the landing party responsible for the repair distributes the Plan of Work for the repair to other consortium parties. In some instances, this information is not available until the repair process is well underway. In addition, to provide more useful information in the proposed interim report, the reporting licensee should be given 72 hours to review the Plan of Work and to review and clarify any necessary issues with the landing party responsible for the repair before filing the interim report. If the Commission allows only a very brief interval after the receipt of the information triggering the interim report before the filing would be due, as proposed by the Notice, the reporting licensee likely would be unable to review and clarify the information contained in the Plan of Work in this way and the information included in the report likely would be much less accurate.

20. *Final Report.* The information that would be required by the proposed final report is generally available by seven days after the completion of the repair, but in some circumstances, such as a delay in the return of the repair ship, additional time may be required to provide some information. Also, the repair ship contracts for many U.S. landed cables allow the ship operator up to 30 days to provide a final completion report after finishing the repair. As previously noted, the root cause of an outage is generally known by the time a repair is completed, but may sometimes require further research or laboratory testing after the repair is complete. In some instances, the root cause is never determined.

sometimes require further research or laboratory testing after the repair is complete. In some instances, the root cause is never determined.

21. The assurance of confidential treatment for all outage information reported to the FCC would likely be an important concern by consortium parties and may be helpful in obtaining their cooperation in providing information for these reports. A number of consortium agreements require such information to be treated as confidential, and also require consortium parties to request confidential treatment for this information when it is provided to regulators.

The foregoing is true and correct to the best of my knowledge and belief.


Thomas K. McInerney

Dated: December 3, 2015