

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

In the Matter of)	
)	
Reliability and continuity of)	PS Docket No. 11-60
Communications Networks, Including)	
Broadband technologies effects on)	
Broadband Communications Networks of)	
Damage or Failure of Network equipment or)	
severe overload)	
)	

**COMMENTS OF THE ALLIANCE FOR
TELECOMMUNICATIONS INDUSTRY SOLUTIONS**

The Alliance for Telecommunications Industry Solutions (ATIS) hereby submits these comments in response to the *Public Notice* released January 3, 2019, in the above-referenced docket. As one of the key forums where the communications industry discusses network reliability and resiliency issues, ATIS is pleased to have the opportunity to respond to the *Public Notice*.

I. BACKGROUND

ATIS is a global standards development and technical planning organization that develops and promotes worldwide technical and operations standards for information, entertainment, and communications technologies. ATIS’ diverse membership includes key stakeholders from the Information and Communications Technologies (ICT) industry – wireless and wireline service providers, equipment manufacturers, broadband providers, software developers, consumer electronics companies, public safety agencies, and internet service

providers. ATIS is also a founding partner and the North American Organizational Partner of the Third Generation Partnership Project (3GPP), the global collaborative effort that has developed the Long Term Evolution (LTE) and LTE-Advanced wireless specifications. Nearly 600 industry subject matter experts work collaboratively in ATIS' open industry committees and incubator solutions programs.

ATIS' Network Reliability Steering Committee (NRSC) was formed in 1993 at the recommendation of the first Network Reliability and Interoperability Council. The NRSC strives to improve network reliability by providing timely consensus-based technical and operational expert guidance to all segments of the public communications industry. The NRSC addresses network reliability improvement opportunities in an open environment and advises the communications industry through the development of standards, technical requirements, reports, bulletins, Best Practices, and annual reports. The NRSC is comprised of industry experts with primary responsibility for examining, responding to, and mitigating service disruptions for communications companies. NRSC participants are the industry subject matter experts on communications network reliability and outage reporting

II. COMMENTS

The *Public Notice* asks the availability and use of industry Best Practices on disaster coordination, preparation and restoration between the communications sector and power companies.¹ As noted above, ATIS NRSC has been working to identify, develop and enhance industry Best Practices to promote network resiliency and reliability. The industry has been diligently working on the new *Emergency Preparedness and Response Checklist*, which builds upon and expands the previously-developed *NRSC Hurricane Preparedness Checklist* to provide

¹ *Public Notice* at p. 2.

proactive guidance for service providers in preparation for natural disasters and other events beyond just hurricanes. The new, expanded checklist is pending final approval by NRSC and will be published in the near future.

ATIS NRSC has noted that there are a significant number of existing industry Best Practices, ranging from restoration priority and resiliency to safety recommendations and backup power practices. Based on the existing body of relevant Best Practices (attached to these comments as Appendix A), ATIS NRSC does not believe any new Best Practices are required.² ATIS also noted that its NRSC is also working to update existing industry Best Practices, including those related to power-related issues, to provide further clarity about these practices and to remove unnecessary or obsolete language. The NRSC Best Practices Subcommittee will be submitting its recommendations on this matter in the near future.

The Commission seeks input in the *Public Notice* on efforts by the communications sector and power companies to coordinate and plan to sustain and restore commercial power to provide continued communications services during commercial power failures.³ ATIS NRSC notes that the power and communications industry do collaborate through existing forums such as:

- National Coordinating Center for Communications (NCC). Part of the Department of Homeland Security's (DHS) National Cybersecurity and Communications Integration Center (NCCIC), the NCC monitors national and international manmade and natural events that may impact emergency communications. NCC Watch leads emergency communications response and recovery efforts under Emergency Support Function #2 of the National Response Framework. ATIS NRSC notes that power companies have shared industry Best Practices relative to service restoration efforts with the NCC.
- Communications Information Sharing and Analysis Center (ISAC). Also known as the DHS National Coordinating Center, the ISAC's goal is to avert or mitigate impacts upon telecommunications infrastructure so that networks can remain operational. Comm ISAC also acts as a clearinghouse for physical and cyber alerts to the telecommunications industry, collecting, analyzing and disseminating information on vulnerabilities, threats,

² The industry Best Practices are available on ATIS website at <http://www.atis.org/bestpractices/>.

³ *Public Notice* at p. 2.

intrusions and anomalies to carriers, ISPs, satellite providers, broadcasters, vendors and other stakeholders.

With respect to the steps taken by power companies and the communications sector to coordinate recovery efforts, ATIS notes that service providers understand the need to coordinate with power companies without interfering with their efforts, to aid in overall restoration. Moreover, in some cases, providers are restricted by first responders in entering areas with downed power lines. ATIS NRSC is aware that there are existing state and local activities (e.g. Emergency Operations Center (EOC)) that provide for collaboration between power companies and local authorities with regard to clearing and restoration efforts. ATIS NRSC recommends that this communication include the communications sector. ATIS NRSC supports efforts to ensure better and more effective coordination between power companies and the communications sector, noting that effective coordination and prioritization efforts requires daily dialogue between communications providers and power companies.

III. CONCLUSION

ATIS appreciates the opportunity to provide its input to the *Public Notice* and urges the Commission to consider the recommendations above.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Thomas Goode".

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February 8, 2019

Power-Related Best Practices

The following Best Practices are categorized under the key word “power” in the industry Best Practices database. While Best Practices have been widely adopted and implemented by the communications sector, they are not universally applicable to all situations. Decisions regarding the applicability and use of specific Best Practices are may by providers based on expert evaluations, risk assessments, and/or other considerations.

11-7-0497 Network Operators and Property Managers should consider connecting the power load to portable generators stored at critical sites, and configuring them for auto-engage in the event of a failover.

11-7-0549 Network Operators should develop an engineering design for critical network elements and inter-office facilities that addresses diversity, and utilize management systems to provision, track and maintain that inter-office and intra- office diversity.

11-7-0676 Network Operators and Service Providers should not use low voltage disconnects or battery disconnects at central office battery plants.

11-7-0677 Network Operators, Service Providers and Property Managers should only use rectifier sequence controllers where necessary to limit load on the backup power generator.

11-7-5076 Network Operators and Service Providers should ensure and periodically review intra-office diversity of critical resources including power, timing source and signaling leads (e.g., SS7).

11-9-0622 Network Operators, Service Providers, Property Managers and Public Safety should use approved industry standards for Telecommunications Environmental Protection, DC Power Systems for key equipment locations (e.g., routers, central office switches, and other critical network elements) to reduce fires associated with DC power equipment.

11-9-0635 Network Operators, Service Providers, Property Managers and Public Safety should ensure that AC surge protection is provided at the power service entrance to minimize the effects caused by lightning or extremely high voltages.

11-9-0644 Network Operators, Service Providers, Property Managers and Public Safety should use over-current protection devices and fusing.

11-9-0655 Network Operators, Service Providers, Property Managers and Public Safety should coordinate hurricane and other disaster restoration work with electrical and other utilities as appropriate.

11-9-0657 Network Operators, Service Providers, Property Managers and Public Safety should design standby generator systems for fully automatic operation and for ease of manual operation, when required.

11-9-0658 Network Operators, Service Providers, Property Managers and Public Safety should ensure generator life support systems (e.g., radiator fan, oil cooler fan, water transfer pumps, fuel pumps, engine start battery chargers) are on the essential Alternating Current (AC) buss of the generator they serve.

11-9-0660 Network Operators, Service Providers, Property Managers and Public Safety should have a plan that is periodically verified for providing portable generators to offices with and without stationary engines.

11-9-0662 Network Operators, Service Providers, Property Managers and Public Safety should exercise power generators on a routine schedule in accordance with manufacturer's specifications. For example, a monthly 1-hour engine run on load, and a 5-hour annual run.

11-9-0664 Network Operators, Service Providers and Equipment Suppliers should provide indicating type control fuses on the front of the power panels, including smaller distribution panels.

11-9-0668 Network Operators, Service Providers, Equipment Suppliers, Property Managers and Public Safety should clearly label the equipment served by each circuit breaker and fuse.

11-9-0669 Network Operators, Service Providers, Property Managers and Public Safety should develop and/or provide appropriate emergency procedures for Alternating Current (AC) transfer.

11-9-0671 Network Operators, Service Providers, Property Managers and Public Safety should design and implement a preventive maintenance and inspection program for electrical systems.

11-9-0674 Network Operators, Service Providers, Property Managers, and Public Safety should initiate or continue a modernization program to ensure that outdated power equipment is phased out of plant considering capabilities of smart controllers, local and remote monitoring and control, alarm systems when updating power equipment, and being integrated into engineering and operational strategies.

11-9-0689 Network Operators, Service Providers and Public Safety should provide a separate "battery discharge" alarm for all critical infrastructure facilities, and where feasible, periodically (e.g., every 15 minutes) repeat the alarm as long as the condition exists.

11-9-0690 Network Operators, Property Managers and Public Safety should consider providing power alarm redundancy so that no single point alarm system failure will lead to a network power outage.

11-9-0694 Network Operators and Service Providers should check for current flow in cables with AC/DC clamp-on ammeters before removing the associated fuses or opening the circuits during removal projects.

11-9-0695 Network Operators, Service Providers, Property Managers and Public Safety should develop and test plans to address situations where normal power backup does not work (e.g., commercial AC power fails, the standby generator fails to start, automatic transfer switch fails).

11-9-0697 Network Operators, Service Providers, Equipment Suppliers and Public Safety should employ an "Ask Yourself" program as part of core training and daily operations.

- 11-9-0699 Network Operators, Service Providers, Equipment Suppliers, Property Managers and Public Safety should design standby systems (e.g., power) to withstand harsh environmental conditions.
- 11-9-0701 Network Operators, Service Providers, Property Managers, and Public Safety should provide security for portable generators.
- 11-9-0760 Network Operators, Service Providers and Public Safety should maintain records that accurately track the diversity of internal wiring for office synchronization, including timing leads and power.
- 11-9-0773 Network Operators, Service Providers, Property Managers, and Public Safety should perform annual capacity evaluation of power equipment, and perform periodic scheduled maintenance, including power alarm testing.
- 11-9-0774 Network Operators, Service Providers, Equipment Suppliers, and Public Safety should provide warning signs to indicate precautions to be taken when powering on circuits that require special procedures
- 11-9-1028 Network Operators, Service Providers, Public Safety and Property Managers should engage in preventative maintenance programs for network site support systems including emergency power generators, UPS, DC plant (including batteries), HVAC units, and fire suppression systems.
- 11-9-1029 Network Operators, Public Safety and Service Providers should periodically review their portable power generator needs to address changes to the business.
- 11-9-1067 Network Operators, Public Safety, Service Providers and Property Managers should consider, in preparation for predicted natural events, placing standby generators on line and verifying proper operation of all subsystems (e.g., ice, snow, flood, hurricanes).
- 11-9-5131 Network Operators and Public Safety should provide appropriate security for emergency mobile units (both pre- and post-deployment) in order to protect against a coordinated terrorist attack on emergency communications capabilities.
- 11-9-5133 Network Operators and Public Safety should minimize availability of information to a need to know basis regarding locations where emergency mobile units and equipment are stored.
- 11-9-5204 Service Providers, Network Operators, Public Safety and Property Managers should ensure availability of emergency/backup power (e.g., batteries, generators, fuel cells) to maintain critical communications services during times of commercial power failures, including natural and manmade occurrences (e.g., earthquakes, floods, fires, power brown/black outs, terrorism). The emergency/backup power generators should be located onsite, when appropriate.
- 11-9-5206 Network Operators, Service Providers, Public Safety and Property Managers should maintain sufficient fuel supplies for emergency/backup power generators running at full load and ensure contracted refueling is in place.

11-9-5207 Network Operators, Service Providers, Public Safety and Property Managers should take appropriate precautions to ensure that fuel supplies and alternate sources of power are available for critical installations in the event of major disruptions in a geographic area (e.g., hurricane, earthquake, pipeline disruption). Consider contingency contracts in advance with clear terms and conditions (e.g., Delivery time commitments, T&Cs).

11-9-5208 Network Operators, Service Providers, Equipment Suppliers, Public Safety and Property Managers should ensure that electrical work (e.g., AC and high current DC power distribution) is performed by licensed technicians.

11-9-5231 Network Operators, Service Providers, Public Safety, and Equipment Suppliers and Property Managers should develop documentation for the restoration of power for areas of critical infrastructure including such things as contact information, escalation procedures, restoration steps and alternate means of communication. This documentation should be maintained both on-site and at centralized control centers.

11-9-5232 Network Operators, Service Providers, Public Safety and Property Managers should test fuel reserves used for standby or backup power for contamination at least once a year or after any event (e.g., earth tremor, flood) that could compromise the integrity of the tank housing, fill pipe or supply pipe.

11-9-5241 Network Operators, Service Providers, Public Safety and Equipment Suppliers should consider placing access and facility alarm points to critical or sensitive areas on backup power.

11-9-5281 Network Operators, Service Providers, Public Safety and Property Managers with buildings serviced by more than one emergency generator, should design, install and maintain each generator as a standalone unit that is not dependent on the operation of another generator for proper functioning, including fuel supply path.

11-10-0464 Network Operators and Government should cooperate on zoning issues that affect reliability of communication networks serving the public good.

11-10-0492 Network Operators, Property Managers, and Public Safety should provide back-up power (e.g., some combination of batteries, generator, fuel cells) at cell sites and remote equipment locations, consistent with the site specific constraints, criticality of the site, the expected load and reliability of primary power.

11-10-0493 Network Operators, Property Managers, and Public Safety should consider placing fixed power generators at cell sites, where feasible.

11-10-0494 Network Operators, Property Managers, and Public Safety should consider including a provision in cell-site contracts for back-up power.

11-10-0495 Network Operators, Property Managers, and Public Safety should consider pre-arranging contact information and access to restoral information with local power companies.

11-10-0496 Network Operators, Property Managers, and Public Safety should consider storing their portable generators at critical sites that are not otherwise equipped with stationary generators.

11-10-0498 Network Operators, Property Managers, and Public Safety should consider alternative measures for cooling network equipment facilities (e.g., powering HVAC on generator, deploying mobile HVAC units) in the event of a power outage.

11-10-0499 Network Operators, Service Providers, and Public Safety should consider ensuring that the back-haul facility equipment located at the cell site is provided with backup power duration equal to that provided for the other equipment at the cell site.

11-10-0543 Network Operators and Service Providers should establish agreements with Property Managers for both regular and emergency power.

11-10-0623 Network Operators and Service Providers using Valve Regulated Lead Acid (VRLA) batteries should perform annual maintenance by performing a discharge test or by using an ohmic test instrument.

11-10-0624 Network Operators, Service Providers, and Property Managers are encouraged to establish rectifier case history files, by equipment category to facilitate decisions to replace equipment with more efficient equipment based on failure trends.

11-10-0625 Network Operators, Service Providers, Public Safety, and Property Managers should consider placing electric utility transformers external to buildings.

11-10-0627 Network Operators, Service Providers, Public Safety, and Property Managers should exercise, service, and calibrate AC circuit breakers per manufacturers' recommendations.

11-10-0634 Network Operators, Service Providers, Public Safety, and Property Managers together with the Power Company should verify that aerial power lines are not in conflict with hazards that could produce a loss of service during high winds or icy conditions.

11-10-0648 Network Operators, Service Providers, Public Safety, and Property Managers should ensure certified inspection of boilers & fuel storage units.

11-10-0650 Network Operators, Service Providers, Public Safety, and Property Managers should place strong emphasis on activities related to the operation of power systems (e.g., maintenance procedures, alarm system operation, response procedures, and training).

11-10-0651 Network Operators, Service Providers, Public Safety, and Property Managers should consider providing diversity within power supply and distribution systems so that a single point of failure (SPOF) is not catastrophic in critical network locations.

11-10-0652 Network Operators, Service Providers, Equipment Suppliers and Property Managers should adhere to applicable power engineering design standards.

11-10-0653 Network Operators, Service Providers, Public Safety, and Property Managers should retain complete control concerning when to transfer from the electric utility and operate standby generators.

11-10-0654 Network Operators, Service Providers and Property Managers should generally avoid entering into power curtailment or load shedding contracts with electric utilities.

11-10-0656 Network Operators, Service Providers, and Public Safety should establish a requirement for power conditioning, monitoring and protection for sensitive equipment.

11-10-0663 Network Operators, Service Providers, Public Safety, and Property Managers should coordinate scheduled power generator tests with all building occupants to avoid interruptions.

11-10-0665 Network Operators, Service Providers and Property Managers should provide and maintain accurate single line drawings of AC switch equipment on-site.

11-10-0667 Network Operators, Service Providers, Public Safety, and Property Managers should keep circuit breaker racking/ratchet tools, spare fuses, fuse pullers, etc. readily available.

11-10-0672 Network Operators and Service Providers should provide a minimum of 3 hours battery reserve for central offices equipped with fully automatic standby systems.

11-10-0673 Network Operators and Service Providers should provide some method to detect/prevent thermal runaway on rectifiers when valve regulated batteries are used.

11-10-0675 Network Operators, Service Providers and Property Managers should, for new installations, consider using multiple small battery plants in place of single very large plants, and consider using multiple battery strings in each plant.

11-10-0679 Network Operators, Service Providers and Equipment Suppliers should provide diverse power feeds for all redundant links (e.g., SS7, BITS clocks) and any components identified as critical single points of failure (SPOF) in the network.

11-10-0680 Network Operators, Service Providers, Equipment Suppliers, Public Safety, and Property Managers should provide protective covers on vulnerable circuit breakers which power critical equipment.

11-10-0681 Network Operators, Service Provider, Equipment Suppliers and Property Managers should ensure that fuses and breakers meet quality reliability standards.

11-10-0682 Network Operators, Service Providers, Equipment Suppliers, Public Safety, and Property Managers should ensure that power wire, cable, and signaling cables used in communications locations meet Network Equipment Building Systems (NEBS) compliance.

11-10-0683 Network Operators, Service Providers, Property Managers, Public Safety, and Equipment Suppliers should not mix Direct Current (DC) power cables, Alternating Current (AC) power cables and telecommunications cables wherever possible.

11-10-0684 Network Operators, Service Providers, Equipment Suppliers, and Property Managers should verify DC fusing levels throughout the power supply and distribution system, especially at the main primary distribution board, to ensure that fuses and breakers are not loaded at more than 80% of their rated ampacity.

- 11-10-0685 Network Operators and Service Providers should have detailed methods and procedures to identify the protection required for energized DC buses.
- 11-10-0692 Network Operators, Service Providers, Public Safety, and Equipment Suppliers should consider using fail-safe alarm points (i.e., alarm point that does not require power to operate) for critical alarms.
- 11-10-0696 Network Operators and Service Providers should use infrared thermography to check power connections and cabling in central offices when trouble shooting, during installation test and acceptance, and as otherwise appropriate.
- 11-10-0700 Network Operators, Service Providers, Public Safety, and Equipment Suppliers should consider the use of power expertise/power teams.\
- 11-10-0702 Network Operators and Service Providers should minimize dependence on equipment requiring AC power feeds in favor of DC-powered components.
- 11-10-0703 Network Operators, Service Providers, Public Safety, and Property Managers should secure remote power maintenance systems to prevent unauthorized use.
- 11-10-0761 Network Operators, Service Providers, and Public Safety should conduct periodic verification of the office synchronization plan and the diversity of timing links, power feeds and alarms.
- 11-10-0787 Network Operators, Service Providers, and Property Managers should consider the use of fixed alternate fuel generators (e.g., natural gas) connected to public utility supplies to reduce the strain on refueling.
- 11-10-0799 Service Providers, Network Operators and Property Managers should periodically evaluate the need for and feasibility of providing back up power at cell sites and broadband network equipment, at remote locations where economically and technically practical taking into consideration the criticality of the site or location, as well as local zoning laws, statutes, and contractual obligations.
- 11-10-0819 Service Providers, Network Operators and Property Managers should periodically evaluate the need for and feasibility of providing back up power at cell sites and broadband network equipment, at remote locations where economically and technically practical taking into consideration the criticality of the site or location, as well as local zoning laws, statutes, and contractual obligations.
- 11-10-1033 Network Operators should develop a strategy for deployment of emergency mobile assets such as Cell on Wheels (COWs), cellular repeaters, Switch on Wheels (SOWs), transportable satellite terminals, microwave equipment, power generators, HVAC units, etc. for emergency use or service augmentation for planned events (e.g., National Special Security Event (NSSE)).
- 11-10-1068 Network Operators, Service Providers and Property Managers should utilize Transfer Switch Equipment that conforms to industry standards.

11-10-1069 Network Operators, Equipment Suppliers and Property Managers should consider marking or modifying copper bars and cable to deter theft, to make them easier to identify at scrap yards, and/or to reduce their value.

11-10-1070 Network Operators, Service Providers, Public Safety, and Property Managers should utilize a UL standard for Transfer Switch Equipment.

11-10-1071 Network Operators, Service Providers, Public Safety, and Property Managers should mechanically and electrically interlock transfer breaker systems when they are utilized.

11-10-1072 Network Operators, Service Providers, Public Safety, and Property Managers should verify that protector size does not exceed cable rated current capacity.

11-10-5041 Network Operators, Service Providers, Equipment Suppliers, Public Safety, and Property Managers should establish and implement policies and procedures to secure and restrict access to power, environmental, security, and fire protection systems.

11-10-5042 Network Operators, Service Providers, Public Safety, and Property Managers should establish and implement policies and procedures to secure and restrict access to fuel supplies.

11-10-5058 Network Operators, Service Providers, Equipment Suppliers, Public Safety, and Property Managers should ensure that all critical infrastructure facilities, including the security equipment, devices and appliances protecting it, are supported by backup power systems (e.g., batteries, generators, fuel cells).

11-10-5197 Network Operators, Service Providers, Public Safety, and Property Managers should periodically inspect, or test as appropriate, the grounding systems in critical network facilities.

11-10-5203 Network Operators, Service Providers, Public Safety, and Property Managers should develop, maintain and administer a comprehensive program to sustain a reliable power infrastructure.

11-10-5209 Network Operators, Service Providers, Public Safety, and Property Managers should restrict access to the AC transfer switch housing area, ensure that scheduled maintenance of the transfer switch is performed, and ensure that spare parts are available.

11-10-5210 Network Operators, Service Providers and Property Managers should discourage use of Emergency Power Off (EPO) switches between the primary battery supplies and the main power distribution board. EPO switches are not recommended for use in traditional -48V DC battery plants.

11-10-5211 Network Operators, Service Providers, Public Safety, and Property Managers should, under normal conditions, disable power equipment features that allow switching off of power equipment from a remote location (i.e. dial up modem), but may consider activating such features during severe service conditions, to allow a degree of remote control.

11-10-5212 Network Operators, Service Providers, Public Safety, and Property Managers should consider placing generator sets and fuel supplies for critical sites within a secured area to

prevent unauthorized access, reduce the likelihood of damage and/or theft, and to provide protection from explosions and weather.

11-10-5213 Network Operators, Service Providers, Public Safety, and Property Managers should, where feasible, place fuel tanks in a secured and protected area restrict access to fill pipes, fuel lines, vents, manways, to reduce the possibility of unauthorized access.

11-10-5214 Network Operators, Service Providers, Public Safety, and Property Managers should consider placing all power and network equipment in a location that affords physical protection from potential vulnerabilities based on risk of the location.

11-10-5216 Network Operators, Service Providers, Public Safety, and Property Managers should consider providing secure pre-constructed exterior wall pathways for mobile generator connections or tap box connections.

11-10-5229 Network Operators, Service Providers, Public Safety, and Property Managers should have controlled access to comprehensive facility cabling documentation (e.g., equipment installation plans, network connections, power, grounding and bonding) and keep a backup copy of this documentation at a secured off-site location.

11-10-5250 Network Operators and Service Providers should develop an engineering design for critical network elements and inter-office facilities that addresses diversity, and utilize management systems to provision, track, and maintain and restore that inter-office and intra-office diversity.

11-10-5275 Network Operators, Service Providers, Public Safety, and Equipment Suppliers should consider backup power capabilities for Command and Control (Crisis Teams) so that communications and access to critical systems can be maintained in the event of a significant disruption to commercial power.