



INTERGOVERNMENTAL ADVISORY COMMITTEE

to the

FEDERAL COMMUNICATIONS COMMISSION

ADVISORY RECOMMENDATION No: 2019-3

In the Matter of Intergovernmental Disaster Response Coordination

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I. INTRODUCTION

The FCC's Intergovernmental Advisory Committee (IAC) met at Federal Communications Commission headquarters on October 4, 2018, March 22, 2019, and on June 14, 2019. The IAC is comprised of elected and appointed state, local and Tribal (SLTT) officials. At its October meeting, the IAC was tasked with developing recommendations for fine-tuning state, local, and Tribal coordination for disaster preparation, response, and restoration efforts. The recommendations herein include best practices to promote resilient communications during and after an incident to help ensure first responders and the public have access to reliable communications when disaster strikes. The importance of maintaining resilient communications during and after a disaster cannot be overstated. Sometimes, the ability to communicate during and after a disaster is a matter of life and death.

II. DISCUSSION

A. Intergovernmental Disaster Response Coordination

Communications lapses can cause significant delays in helping those in need and can contribute to loss of life and property. The inability to communicate diminishes understanding of what is happening across affected areas. For example, a lack of communications regarding road conditions could delay emergency services. Further, without resilient communications, damages to critical facilities, such as fire and police stations, power plants, hospitals, and water and wastewater facilities, cannot be quickly assessed and remediated.

In drafting these recommendations, this Committee has utilized several FCC hurricane "Communications Status Reports", as well as the knowledge and information of IAC committee members from states and territories prone to natural disasters, including Arizona, Colorado, North Carolina, South Carolina, Texas, Puerto Rico, the Virgin Islands, and certain Tribal territories.

1. Disaster Planning and Preparation

a. Emergency Management Planning

Disasters do happen, and contrary to popular belief, they do not always happen to others. With this in mind, there is a need to have an emergency management plan. Emergency management planning pertains to avoiding risks, particularly those with catastrophic consequences for communities. Effective emergency management planning prepares stakeholders to mitigate, respond to, and recover from emergencies. Thus, effective planning makes it possible to manage the entire life cycle of a potential emergency by establishing priorities, identifying expected levels of performance and capabilities, and helping stakeholders understand and learn their roles.

i. Hurricane Maria

The 2017 Atlantic hurricane season included Hurricanes Harvey, Irma, Maria, and Nate, but Maria had the greatest impact. Hurricane Maria caused not only significant loss to life and property, but also major damage to telecommunications and other critical infrastructures in both Puerto Rico and the U.S. Virgin Islands (USVI). This resulted in much longer recovery times compared to Hurricane Harvey's effect on Texas, Hurricane Irma's effect on Florida, or Hurricane Nate's effects along the Gulf Coast.

For Puerto Rico, 95.6 percent of the cell sites were out of service at its worst. Forty-eight out of 78 *municipios* had 100 percent of their cell sites out of service. Wireless service was restored gradually over a six-month period, considerably longer than for any other storm. After six months, 44 percent of cell sites remained out of service (i.e., completely inoperable) -- outages more typical of a few days after, not many months after, a significant hurricane.

ii. *Puerto Rico: Lessons Learned from Hurricane Maria on the Necessity of Emergency Management Planning*

Following the devastation of Hurricane Maria, Puerto Rico learned that effective emergency management planning is essential to protect and quickly restore its communications during disasters. Puerto Rico has now entered into a memorandum of understanding (MOU) between telecommunications providers, government, and other relevant stakeholders which establishes, among other things, the clear roles of each party and the obligations of the parties to meet at a previously designated, dedicated telecommunications emergency operations center (EOC), before and after the emergency, to deal with all matters relating to (and impacting) telecommunications.

From this single EOC, carriers, government, subcontractors, municipalities, and other industry participants may address telecommunication issues and coordinate a unified response. This response would be the official communications regarding telecommunications restoration efforts. The information would then be uploaded to a governmental dashboard to be disseminated to the public. The information would also be transmitted to the Governor's office for their daily briefings to the citizens and would also form the basis for press releases to the news media and updates on social media outlets.

Puerto Rico believes that the emergency management planning that will be facilitated by the MOU and EOC will in the future, save lives and property and prevent a repeat of the long communications outages experienced by the island during Hurricane Maria.

Major priorities should include removing all obstacles, whether from federal and state agencies or private owners, so that the telecommunications industry has access to critical communications facilities post-disaster. Other priorities should be GEO mapping for utilities' critical infrastructure, roaming agreements among providers, fuel supplies (particularly priority in fuel supply for carriers and their subcontractors), security for critical facilities, FCC waivers for experimental technology, acquisition of generators, EPA Waivers for noncompliant generators, municipal and state waivers from regular permitting processes for reconstruction and restoration, abeyance of taxes for materials coming for restoration, ports and airports prioritization of materials for telecom restoration, access to towers and finally, drafting of executive orders for access to private rights of ways. Where confidential or proprietary information is exchanged, all stakeholders should be required to sign non-disclosure agreements before exchanging such information.

Having a dedicated EOC located in a separate room is extremely effective since all players are within reach - carriers, government, tower owners, industries, etc. Also, having round-the-clock telecommunications emergency personnel committed to the EOC makes sure that any matter concerning telecommunications will be referred to the telecom EOC for a centralized resolution. Lastly, having regular interaction between the state emergency agency and the regulator ensures that their expertise is used in the state public safety communications plan.

iii. *Identifying and Mapping Critical Communications Facilities and Road Access to these Facilities*

Certain facilities are deemed critical because they provide services and functions that are essential to a community, especially during and after a disaster. When critical communications facilities are damaged or destroyed, they cause significant interruptions to telecommunications services. Therefore, the specific goal of every community during a disaster should be to protect these critical facilities. During emergency management planning, special attention should be given to identifying critical communications facilities and the risk to them during a disaster. Much of this risk can be reduced

through hazard mitigation, designing the facilities for resistance, and operating them with minimal exposure. Additional risk can be reduced by adding redundancy. The critical facility identification and mapping process should include the location of the facility, information necessary to receive support and spare parts on a timely basis, an understanding of the rationale as to why the asset is deemed critical, and an action plan to mitigate the criticality for each identified asset.¹

Plans to identify and map critical communications facilities must also address priority clearance of access roads to these facilities and identify who will be allowed to enter these roads. During a disaster, roads could be impassable due to flooding, downed trees and other debris, and damaged bridges and roadways. This may precipitate road closures due to unsafe conditions. An effective emergency management plan should address the prioritization of the clearance of critical facility roadways, who will be allowed access, who will manage access, and who will make the determination of when it is safe for restoration efforts to begin. The Wireless Network Resiliency Cooperative Framework, which was established by the CTIA – The Wireless Association,² recommends that during an emergency, local governments should consider streamlining permitting processes to allow critical infrastructure providers expeditious access to restore services.³ It further recommends credentialing programs to help ensure access to staging areas and affected locations for individuals participating in restoration efforts.⁴ It states that by standardizing these programs, local governments and providers can streamline efforts to ensure appropriate access during a disaster.⁵ In that regard, government agencies should, where possible, develop multi-jurisdictional credentialing templates and qualifications consistent with guidance from the Federal Emergency Management Agency.⁶ Further, if travel restrictions are activated, state and local governments should identify permissive or detour routes for certain vehicles, such as fuel trucks.⁷

The IAC believes that given differences in climate, weather and geographic conditions throughout the country, standardization efforts are best left to the states and local governments and should not be dictated from Washington.

iv. Identifying Critical Lines and Conduits

During the recovery phase of a disaster, critical communications network infrastructure, which oftentimes has survived the crisis, can be damaged by restoration crews who were either unaware of its location or unaware of its importance. This damage can occur repeatedly as the lines are repaired and new crews come in and make the same mistakes. An effective emergency management plan should address these issues and set out detailed instructions for how restoration crews will be made aware of critical communications network infrastructure and who will be responsible for notifying these crews.

¹ WBDG, *Critical Equipment Identification and Maintenance*, WBDG.ORG, <https://www.wbdg.org/resources/critical-equipment-identification-and-maintenance> (last visited Sep. 17, 2019).

² CTIA is a trade association representing the wireless communications industry in the United States. The association was established in 1984 and is headquartered in Washington, D.C. It represents wireless carriers and suppliers, and manufacturers and providers of wireless products and services.

³ CTIA, *Best Practices for Enhancing Emergency and Disaster Preparedness and Restoration*, CTIA.org, <https://api.ctia.org/docs/default-source/default-document-library/best-practices-for-enhancing-emergency-and-disaster-preparedness-and-restoration.pdf> (last visited Sep. 17, 2019).

⁴ *Id.*

⁵ *Id.*

⁶ *Id.*

⁷ *Id.*

The Common Ground Alliance (CGA) is an organization dedicated to preventing damage to underground utility infrastructure.⁸ Its goal is to develop information and analysis designed to enhance its members' ability to implement effective damage prevention processes and programs and to increase education of the industry, public and policymakers about the importance of the damage prevention process. CGA provides a forum where stakeholders can share information and perspectives and work together on all aspects of damage prevention issues. These member stakeholders represent the following industries and public entities: excavators, locators, road builders, electric, telecommunications, oil, gas distribution, gas transmission, railroad, One Call, public works, equipment manufacturing, state regulators, insurance, emergency services, and engineering and design. With participation in organizations like the CGA, states, local and Tribal governments can learn about best practices to minimize damage to critical lines and conduits during a disaster.

v. *Hurricane Michael*

Hurricane Michael was one of the most powerful storms to make landfall in the United States. Hurricane Michael inflicted over \$25 billion dollars in damage and resulted in 57 known deaths on the American mainland. Driven by high Category 5 winds, Hurricane Michael hit the Florida Panhandle on October 10, 2018. It was the strongest recorded storm to hit the Panhandle and the strongest to hit the continental United States since Hurricane Andrew in 1992. It caused severe damage to communications infrastructure in the State of Florida, particularly in Bay and Gulf Counties, as well as significant damage to Southeastern and Mid-Atlantic states.

vi. *Deploying Emergency Personnel and Prepositioning Portable Emergency Communications Equipment and Supplies*

On May 9, 2019, the FCC's Public Safety and Homeland Security Bureau released a report on its investigation into communications providers' preparation for and response to Hurricane Michael.⁹ Due to the timeliness of this Report, we have significant information on the extensive actions taken by providers prior to the storm, which will help inform our recommendations herein. These actions include deployment of emergency personnel and emergency communications equipment and supplies, including COWs (cell on wheels), COLTs (cell on light trucks), mobile command centers, device charging sites, refueling backup generators, and temporary microwave/satellite communications.

According to the report, AT&T deployed thirty-two COWs and COLTs, a Flying COW (much like a drone) in Mexico Beach, Florida, seven emergency communications vehicles and emergency Communications Portables, a hazardous material and mobile command center, and four device charging sites. Southern Linc deployed refueling backup generators, increased staffing, and prepositioned equipment, supplies, personnel and resources as close as possible to the storm's projected path.

Sprint utilized several staging locations near the potential impact area and T-Mobile pre-staged assets, including mobile generators and temporary microwave/satellite communications. At the same time, Verizon moved prepositioning equipment from the Carolinas. Its workers topped-off all generators with fuel and established refueling stations across six states. Verizon also maintained battery backup power at all cell sites and backup generators at approximately ninety percent of its permanent sites.

⁸ Common Ground Alliance, *About Us*, COMMONGROUNDALLIANCE.COM, <http://commongroundalliance.com/about-us> (last visited Sep. 17, 2019).

⁹ See FCC, Public Safety and Homeland Security Bureau, *October 2018 Hurricane Michael's Impact on Communications: Preparation, Effect, and Recovery - Report and Recommendations* (2018), <https://docs.fcc.gov/public/attachments/DOC-357387A1.pdf> (last visited Sep. 17, 2017).

Cable companies also prepositioned fuel, generators, and other materials at locations they expected to be just outside the disaster area and Comcast tested and refueled backup generators and staged fuel trucks nearby.

vii. *Roaming Agreements in Advance Set the Stage to Maximize Coverage for Consumers during Disasters*

Roaming allows mobile wireless customers to automatically receive service when they are outside of the area covered by their provider's network. Mobile wireless service providers enter into roaming agreements with each other, so that their customers will be able to roam and receive service automatically, regardless of their location. The Hurricane Michael Report pointed out that some wireless providers did not obtain and implement supplemental roaming agreements in advance of the storm and that providers would have greatly improved the availability of wireless service for their customers had they secured and activated such agreements. In one situation, a wireless service provider neglected to establish and implement roaming agreements prior to the storm, resulting in its customers being without cell service for several days, while neighboring customers on a different network received service. In Puerto Rico, during the recovery efforts after Hurricane Maria, an update from AT&T stated that roaming agreements were helping wireless customers access service.¹⁰ The FCC also noted that, “the four major wireless companies. . . opened up roaming on the islands so that they, collectively, can serve the maximum population of the islands with the current coverage available.”¹¹

viii. *Improving Interoperable Public Safety Communications*

Disasters, whether natural or man-made, rarely occur only in large cities, where all first responders communicate with the same equipment on the same frequencies. To be sure, the nation has come a long way since the Oklahoma City bombing in 1995¹² and the Columbine High School tragedy in 1999.¹³ Developing better and more reliable interoperable public safety communications has properly been a focus at the federal, state and local level. However, even a brief review of the materials available

¹⁰ AT&T, *Hurricane Maria: Response and Live Updates*, ATT.COM, https://about.att.com/inside_connections_blog/hurricane_maria (last visited Sep. 17, 2019). An AT&T update stated, “We have also been able to connect our customers through innovative new wireless roaming agreements. For example, we are working with a company called Vanu that currently has three satellite-based cell sites up and running in Puerto Rico and 30 more arrived October 11. Nine cell sites also arrived the same day in the U.S. Virgin Islands.”

¹¹ FCC, *Communications Status Report for Areas Impacted by Hurricane Maria October 15, 2017*, FCC.GOV, <https://docs.fcc.gov/public/attachments/DOC-348488A1.pdf> (last visited Sep. 17, 2017).

¹² Oklahoma Office of Homeland Security, *Interoperable Communications Planning in Oklahoma*, OK.GOV, https://www.ok.gov/homeland/Interoperable_Communications/index.html (last visited on Sep. 17, 2017). (“During the search and rescue efforts, critical information in the form of hand-written notes was passed between first responders via couriers equipped with golf carts due to the lack of seamless interoperable communications between responders.”).

¹³ Viktor Mayer-Schönberger, *Emergency Communications: The Quest for Interoperability in the United States and Europe*, HKS.HARVARD.EDU, <https://research.hks.harvard.edu/publications/getFile.aspx?Id=43>. (“Coordination was difficult not primarily because of turf wars or lack of crisis management . . . The real challenge was simpler—and much more serious. Responders from the various agencies had no communications system that would permit them to communicate with each other. Agencies used their own radio systems, which were incompatible with those of others.”). <https://research.hks.harvard.edu/publications/getFile.aspx?Id=43>.

from FirstNet,¹⁴ SAFECOM,¹⁵ state and local emergency management agencies, public safety associations, service providers, and manufacturers will demonstrate that there is still much work to be done. The IAC recognizes that the Commission has an advisory committee, the Communications Security, Reliability, and Interoperability Council, and that specific recommendations on interoperability are more likely to be placed within that committee’s scope of work. The IAC recommends that the Commission take a leadership role in the continuing work that needs to be done to improve interoperable public safety communications nationwide.

2. Disaster Mitigation During the Event

a. Hurricane Michael: Types of Damage

As noted previously, Hurricane Michael was one of the most powerful storms to make landfall in the United States. Hurricane Michael inflicted over \$25 billion dollars in damage and resulted in 57 known deaths on the American mainland. Driven by high Category 5 winds, Hurricane Michael hit the Florida Panhandle on October 10, 2018. It was the strongest recorded storm to hit the Panhandle and the strongest to hit the continental United States since Hurricane Andrew in 1992. It caused severe damage to communications infrastructure in the State of Florida, particularly in Bay and Gulf Counties, as well as significant damage to Southeastern and Mid-Atlantic states.

b. Hurricane Michael: Efforts to Mitigate the Damage

According to the Hurricane Michael Report, the leading cause of cell site outages on the first day of the storm were power outages, as high winds brought down overhead power lines. Gulf Power reported the need to essentially “rebuild” its electrical distribution network in its regional service area, which included replacing 7,000 distribution poles and 200 miles of distribution lines. AT&T, T-Mobile, Sprint, and Verizon all noted leveraging deployable assets to get their networks up and running prior to full fiber restoration in the area. Verizon also noted leveraging deployable assets to provide limited service for governments and first responders. T-Mobile used pre-staged microwave assets to reconfigure its microwave network in order to compensate for lost backhaul and route traffic to operational cell sites.

c. During the Event

During an event, life safety is the primary objective – both for the public and for the emergency responders and emergency communications recovery personnel whose job it is to protect the public. This primary objective will be compromised if emergency responders and emergency communications recovery personnel are lost due to being placed in dangerous situations during the event.

It is important during an event not to assume your community knows what you know. Therefore, during an event, a mass notification system to communicate protective actions, such as evacuation orders and safety shelter information, is important.¹⁶

“During an emergency, alert and warning officials need to provide the public with life-saving information quickly. IPAWS (Integrated Public Alert Warning System) is a modernization and integration

¹⁴ FirstNet, *About Us*, <http://www.firstnet.gov>, <https://www.firstnet.gov/about> (last visited Sep. 17, 2019).

¹⁵ Homeland Security, *Safecom, Assuring a Safer America through Effective Public Safety Communications*, DHS.GOV, <https://www.dhs.gov/safecom> (last visited Sep. 17, 2019).

¹⁶ Don Hall, *The Emergency Manager’s Guide to Hurricane Survival*, DRJ.COM (Aug. 3, 2017 9:32 PM), <https://www.drj.com/journal/fall-2017-volume-30-issue-3/the-emergency-manager-s-guide-to-hurricane-survival.html>.

of the nation's alert and warning infrastructure, and will save time when time matters most, protecting life and property."¹⁷

Federal, state, local, Tribal, and territorial alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure.¹⁸ IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.¹⁹

South Carolina currently has fifteen emergency management entities — including the State Emergency Management Division — authorized to use the IPAWS system,²⁰ and six emergency management entities in process to be authorized users.²¹ On April 2, 2019, at 1:00 pm ET, the state had a drill using the system within a ten-mile radius of the V. C. Summer Nuclear Power facility.²²

Communication among other emergency managers at the federal, state, and local levels is also important. A coordinated, consistent, and uniform message is important in order to prevent further confusion. This includes your local media partners, response partners, and stakeholders. If you use social media — and you should — emergency management entities must monitor social media to make sure no one is sharing incorrect information.²³

A quick Google search of what to do during a storm results in references that concern South Carolina. The first is from Horry County notifying citizens that if you have a life-threatening emergency during a disaster event to call 911. It further states that “operators will be available to answer your call and to dispatch assistance as conditions permit.” Such is the nature of trying to mitigate after the horse is out of the barn. As has been stated many times, emergency mitigation happens during blue skies, not during the storm. The second South Carolina reference brings you to the South Carolina Emergency Management Division website, where Operational Condition Levels and coordination is discussed.

Additional references are for survival measures that citizens can take if they are caught in an event. The important thing to remember is that there is nothing like being prepared before the event to be in the best position during and after it. This applies to communications as well.

¹⁷ FEMA, *Integrated Public Alert and Warning System*, FEMA.GOV, <https://www.fema.gov/integrated-public-alert-warning-system> (last visited Sep. 17, 2019). (Watch a video about IPAWS here: <https://www.fema.gov/media-library/assets/videos/77356>).

¹⁸ *Id.*

¹⁹ *Id.* (View a list of [IPAWS Organizations with Public Alerting Authority Completed](https://www.fema.gov/alerting-authorities) in each state here: <https://www.fema.gov/alerting-authorities>).

²⁰ FEMA, *Organizations with Alerting Authority Completed*, FEMA.GOV, https://www.fema.gov/media-library-data/1568229658188-b58335d0b5dbfd6558e19f284f8a2a2d/AA_Complete_09112019.pdf (last visited Sep. 17, 2019).

²¹ FEMA, *Organizations with Alerting Authority in Process*, FEMA.GOV, https://www.fema.gov/media-library-data/1568229800024-6d157fc8c5805fc0112e9636dd8bafa9/AA_InProcess_09112019.pdf (last visited Sep. 17, 2019).

²² Press Release, South Carolina Emergency Management Division, *Local Wireless Emergency Alert Test on April 2*, SCEMD.ORG (Mar. 25, 2019), <https://www.scmd.org/news/local-wireless-emergency-alert-test-on-april-2/>.

²³ Hall, *supra* note 16.

In certain parts of the country, the local government media operations are the best source to disseminate critical information to the public. For example, Durango is a rural town in Southwest Colorado of 18,000 residents, in a county of 55,000, and a regional area of 250,000. The city is three hours from the nearest interstate, surrounded by mountains and 1.5-million acres of National Forest. Durango has been in the Albuquerque Designated Market Area (DMA), so it receives very little coverage of Colorado news, weather and events via commercial television. It is what is commonly referred to as “an orphan community” when it comes to television. Durango’s government cable channel, DGOV, distributes local information via its PEG channel, which airs on Charter Cable within Durango, and is streamed live on the city’s website, as well as over the air via LPTV in Durango and Cortez Colorado, to the west. The city is among some of the first HD PEG channel communities in the country, and one of perhaps only a handful who have also found a need to expand its local government programming signal over the air.

On June 1, 2018, the 416 Wildfire broke out just north of Durango, burning for almost five months across 55-60,000 acres. For almost ten weeks, DGOV provided continuous information on the fire’s status, evacuations, damage, and the status of the San Juan National Forest areas not affected by the fire. The city created and aired more than 127 slide presentations, providing graphic information with the help of the fire management team. It aired thirty-four daily video updates from the Incident Command Team during the early and most aggressive stages of the fire, and even helped produce some of these reports after embedding staff at the incident command post. DGOV worked with the Forest Service in preparing and airing videos on fire mitigation, safety, and the closure of the San Juan National Forest. The city prepared forty-seven graphic information videos that were distributed over digital displays in place at the community recreation center and other city facilities. The city partnered with local emergency planning officials, La Plata County, Fire Incident Commanders, the health department, and countless others in getting vital information to the public and received significant acclaim from the agencies managing this event. The importance of coordination with local officials in distributing this kind of information cannot be overstated.

d. Disaster Recovery

Disasters always occur at the local level. The citizens in the area where the event occurs, their local governments, and voluntary agencies are the first to have to cope with the damage. States recognize that local governments have the first line of responsibility in the preparation for, response to, and recovery from most emergencies and disasters. Actions by the state are always in support of local government. Strengthening the capabilities of local government will help prevent the loss of life and property during disasters, deliver assistance to victims most expediently, and reduce costs.

During normal operations or during disaster response, life safety is the primary objective. However, in order to conduct lifesaving activities, other actions must be done first. For example, immediately following a hurricane, the first priority is to clear the roadways. This allows police and rescue personnel to perform search and rescue operations and transport victims to the hospital. It also allows the public to travel to hospitals or evacuate from the area. If all the streets are blocked, then no one moves, and the lifesaving activities cannot be conducted. The police cannot respond to residences, the fire department cannot drive to where the fires are occurring, and power crews cannot travel to repair downed powerlines.

This same priority can be applied to all aspects of disaster response. For power and communications restoration, police/fire departments, hospitals and nursing homes should receive top priority. There are numerous other critical infrastructure facilities that are competing for restoration to include water pumping stations, water treatment facilities, sewer treatment plants, telecommunications providers (cell towers, etc.), and private businesses. This is where consistent planning and coordination

between state, local, and Tribal government, as well as all community stakeholders, is critical to a successful response and recovery.

Local, state, and Tribal governments in their respective regions should have detailed plans in place that prioritize restoration of power, communication, and service, etc. This will require constant and consistent communication and coordination between, not only the various local governments, but all the community stakeholders.

As has been the experience in other areas of the United States, the tremendous responses to the recent disasters in South Carolina required a team effort to accomplish such a task, and the State is fortunate to have partners that are professional and work well together. Without them, South Carolina could not have responded as well. These great partners include the Governor's Office, the South Carolina National Guard, State Agencies, County Emergency Managers, FEMA, DHS, the media outlets, the communications industry, and social media platforms.

One of the mainstays for many decades in disaster communications in a recovery has been the use of Amateur Radio Operators, often referred to as HAM Operators. HAM radio's ability to operate when other telecommunications systems cannot is critical to understand in this discussion. "More Americans than ever have been licensed by the [FCC] as amateur operators, and those in the know say that emergency communications is driving their passion to be hams."²⁴ Citizen interest in emergency communications is a result of citizens who saw their cellular phones overwhelmed by excess traffic and system outages. This has resulted in over 30,000 licenses being issued for amateur radio operators by the FCC in 2016, 2015, and 2014.²⁵ Generally, amateur radio operators assist when other means of communications are down or overloaded.

HAM radio resources are available for emergency communications support to any public service agency and can bridge interoperability gaps between agencies on a local, Tribal, and/or state level. Potential HAM deployment locations include, but are not limited to, auxiliary command posts, emergency operations centers, emergency shelters, evacuation sites, fire stations, medical facilities, mobile disaster vehicles, police stations, public works sites, and volunteer intake centers.²⁶ They can also be deployed to provide links to:

- Create communications links between similar agencies across political boundaries, especially where there are misalignments in frequency bands and modes;
- Establish communications in locations outside the existing coverage areas of public service and commercial communications systems;
- "Shadow" critical public officials and emergency management personnel to facilitate constant and rapid contact;
- Monitor critical infrastructure (such as highways and bridges) and provide periodic situation reports;
- Staff operation posts (river levels, flooding, damaged areas) and provide periodic situation reports;

²⁴ James Careless, *Emergency Communications Driving Increase in Amateur Radio Operators*, GOVTECH.com (Apr. 11, 2017), . <https://www.govtech.com/em/disaster/Emergency-Communications-Driving-Increase-in-Amateur-Radio-Operators.html>.

²⁵ *Id.*

²⁶ Steve Aberle, *Ham Radio in Emergency Operations*, DOMESTICPREPAREDNESS.COM (Jun. 21, 2017), <https://www.domesticpreparedness.com/preparedness/ham-radio-in-emergency-operations/>.

- Every hospital has a HAM radio station on premises and there are volunteer HAMs ready to operate (they are generally not hospital employees). These systems are tested on a very regular basis. A typical emergency activity might be identifying which hospitals have the available capacity to accept the injured after an event; and
- Another overlooked HAM application is continuing communications support after an event. An example of this would be after a hurricane has blown through and fires are out etc. There is still no power or phone service. HAMs have provided on-going coordination to families outside the disaster area.²⁷

As a communications provider, HAM radio falls under the Emergency Support Function #2 umbrella. Planning for a “when all else fails” communications scenario is essential for all jurisdictions.

While having a reliable resource for filling in the communications gap during recovery is important, when planning for governmental resiliency, the most effective method for building a resilient government and public safety communication system is to build reliable relationships with other local, Tribal, and state governments. This is most commonly done through Mutual-Aid Agreements. South Carolina has a Statewide Mutual Aid Agreement with almost 400 signatories, including counties, municipalities, fire departments, and special purpose districts. Proper planning needs to address worst-case scenarios and how to survive and recover from them.

III. CONCLUSION

The best practice available to fine-tune coordination between state, local, and Tribal governments is to actually plan and coordinate with each other on a regular basis during “blue skies.” Blue Skies simply means during normal, non-emergency, working conditions. Most state, local, and Tribal governments do not communicate on a regular basis until an emergency or disaster occurs. It is highly unlikely that multiple agencies and organizations will have an efficient and effective working relationship with each other when they are contacting each other for the first time during an actual disaster. All stakeholders must expend the time, funding, and resources to regularly train and coordinate as a “whole community.”

Every day, we must all take steps to ensure that we are prepared to respond to and recover from emergencies and disasters. This preparedness must be conducted by the “whole community.” The whole community includes individuals, families, private and non-profit organizations, faith-based organizations, local, Tribal, state, and federal governments. In addition to all of these “stakeholders” conducting consistent preparedness activities, there must also be a certain level of communication and coordination between them to ensure an efficient and effective response when a disaster does strike. For example, South Carolina has a comprehensive planning, training, and exercising system, which includes individuals from all levels of government, voluntary organizations, and business and industry, and which conducts a state-level, full-scale exercise, as well as a Governor’s Hurricane Tabletop Exercise annually. In addition, communications checks with all systems are conducted weekly between the State and Counties.

IV. RECOMMENDATIONS

In summary, in order to fine-tune preparedness, response and recovery between state, local, and Tribal governments, the IAC recommends:

- Regular training, coordination, and communication is a must. It must be conducted during “blue skies.” When an emergency is occurring, it is too late to start coordinating.

²⁷ *Id.*

- In addition to training for government workers, Training, outreach, and coordination must be provided for the citizens and “stakeholders” that we are trying to protect. A properly trained and informed community is a resilient community.
- A formal infrastructure must be identified with representatives from all stakeholders, who meet throughout the year to familiarize themselves with each other, identify common threats, and coordinate training and response. For example, the South Carolina Emergency Operations Plan is reviewed annually to ensure state agencies and voluntary organizations understand each other’s responsibilities and capabilities. At least twice annually, the South Carolina Emergency Management Division hosts workshops for counties to discuss issues and concerns. Further, regional workshops are conducted quarterly throughout the state.
- All involved parties must have open and redundant lines of communication during normal operations, as well as during emergencies. In order to be efficient and effective, state, local, and Tribal government must know what each other is doing. They must also be aware of the general capabilities and the available resources that each agency involved can contribute.