Transcript of the Speech Delivered by FEMA Administrator Craig Fugate, KK4INZ at the ARRL Centennial Convention Hartford, Connecticut July 18, 2014

Well, good evening.

In 1987, I was a lieutenant with fire rescue. And I had been reassigned downtown to work on the county's disaster plan. And as part of that, I ended up moving full-time into something called emergency management. It's kind of this new thing; we used to call it civil defense. Some of the first people that came knocking on my door were the Gainesville Amateur Radio Society (GARS).

There is a gentleman that was part of GARS, still is, W4TKE, Walt Johnson. And Walt was talking to me about the role of Amateur Radio, and how, as ARES, they supported disaster response, they worked with (the American) Red Cross. And the last guys that were there weren't really user-friendly. And so they started showing me what Amateur Radio could do and how it was part of a backup communications system. So that was really where it got started. I started — pretty much, when it came to Amateur Radio — really looking at it as a resource, primarily (for) emergency services, but also (for) public service in general. And I had some experiences that reinforced that. As we got more advanced with technology, I think (the) government began to see Amateur Radio

less and less as a viable or critical part of emergency communications. Until it breaks.

And we had a situation in Alachua County in Gainesville, Florida, where it was a hub and spoke radio system. All of the dispatch for all of the volunteer fire departments and all the paid departments occurred in the city of Gainesville. And we had remotes going out across the county, to repeater sites — primarily VHF and UHF. We had pretty good coverage. You could walk around with a five-watt handi-talkie and hit the repeaters anywhere on the county radio frequencies. Centralized 911 system, calls came in, got dispatch, toned out to the fire stations, fire stations got dispatch, talked to dispatch, responded. System worked every day. Until somebody cut a cable.

And the cable went to the primary public safety answering point — the PSAP. That's where all your 911 calls are routed. Now, you're supposed to have a backup to that system that automatically rolls over to the backup site if you lose the primary. It didn't roll over. And then the generator had a transfer switch that was supposed to automatically switch; when the power went off you went on to the uninterruptable power supply to UPS to transfer the switch putting you on the generator, and it wasn't even supposed to flicker until the switch actually went about halfway and stuck.

Now, of course, in the Comm Center you don't realize this because you're on the UPS. But the UPS was never designed to carry the full thing at power while you're operating normally. So all of a sudden, it started to go down. Now this took about 5 minutes, to go from everything's working normal to you cannot

answer a 911 call, and you cannot dispatch or talk to anybody. Because all of your transmitters just went dark because you're connected to them by phone lines that have no power. And you have no connectivity. And, as the emergency manager, I was down there, and they say "Craig, something's going on." I was responsible for, you know, the backup plans.

So I called the hams; we had a telephone tree. And I started calling them, I got them, I said, "Look, I got Comm down. We need to stand up a net." We got hams to come to the primary dispatch center. We put hams out at every one of the fire stations throughout the county. And in about 35 minutes we had positive communications from the county dispatch center back out to all the fire stations. And we were able to start telling the fire departments, many of them volunteers, "We don't have any radios, we cannot page you out, and 911 is down. We need you to come to the station and we need the monitor."

We finally got the 911 system back up, because it finally did switch over. So for about half of the evening we were taking 911 calls, taking the information, relaying it to an Amateur Radio operator, who had called to the station that was set up at the fire station, to then tell the crew what the call was to send them out. And that taught me one of the most valuable lessons: No matter how much you test your systems, no matter how much they tell you that transfer switch will never fail, no matter how much BellSouth assured us that the PSAP would roll over automatically…if we build it, it can break.

Now, when I got to the state of Florida, we were dealing with the legacy of Hurricane Andrew. And part of that was about the time you really started to see

Amateur Radio before anybody else was thinking about it — building these elaborate networks, connecting computers across VHF and UHF, using this thing called packet radio. And before there was such a thing as an Internet, you could put an email into a packet system in Key West and get it to Tallahassee in the state EOC — faster than you could fax sometimes. And so we started experimenting again with (it). As we were in emergency management, thinking that fax machines were the latest revolution, turning to Amateur Radio, going, "Wait a minute, you've got statewide networks? You can send digital information across all these different areas? And you can actually sort it out and address it to people? We need to take advantage of that."

And so, throughout my career in Florida, we went through a lot of hurricanes, we went through a lot of disasters, we went through fires, floods — you name it. We had Amateur Radio in the state EOC, we had the North Florida section, and the South Florida section, of the ARES net. We had all this tied in; we were tied in across the state for a variety of issues.

When I come to FEMA, I started asking about Amateur Radio. And it was like, "Now, that's kind of an old technology." I'm like, "So how do we communicate, how do we work with them?"

"Eh. Somewhere in VHS is this office of Emergency Communication; they deal with that." So what's our plan? "Eh, somebody else is doing it." Well, I was kind of busy, I get to FEMA, I've got a lot of work to do. But I finally get to this point where they start talking about "cyber." And all of a sudden, cyber is the big bogeyman. Everything's about cyber in DC right now. And I'm like going,

“Okay, let me get this straight. We’re really worried about cyber. There’s been some very serious incidents that occurred. We’re starting to see more and more this is not just random hackers, or individuals, this is becoming fairly organized.”

I said, “Since I got started in the business, we pretty well have converted from copper wiring to almost anything that touches the public switch network is an IP addressable system, right?” So I said, “If our systems are becoming increasingly IP addressable systems running over these networks, and you think cyber is a big problem, what’s your backup?” So here’s a question: If you really want to short-circuit your local emergency manager or your state emergency manager — he says “Well, Amateur Radio is not really viable anymore.Iit’s kind of an old technology. We’ve got smartphones, we’ve got the Internet, we have iPads, whatever,” ask them this: Can you communicate across your jurisdiction or across your state without touching the public switch network? And they’ll whip out their satellite phones. And I’m like going, “You do know that goes back-hauls over to public switch network.”

“Oh. Well, we’ve got this 800 megahertz system that was sold to us by one of those brand names out there that we bonded out our children’s future to pay for.” [laughter] Well, how’s that working when the computers don’t work? “Oh. Well, we’ve got all of our handi-talkies and everything else.” I said, yeah, how many of you actually sit at your transmitter site? “Oh.” I said, Well, so, how would you operate, if you’re not connected to the public switch network, or it’s degraded, taken down, or —as we see in a lot of natural disasters — power out, overloaded, saturated. What’s your backup plan? And I’m like, don’t you

understand, when you talk about that last mile in the disaster, when you talk about when everything else has failed, you still have Amateur Radio.

And so for FEMA, I got the attention of my smart guys. Because I just said, “Here’s my problem to you. I want to be able to reach all 50 state capitals from a couple of key locations at FEMA, and you cannot touch the public switch network. Tell me how you’re going to do that.” And they got out their charts, and they started mapping out their systems, and we have quite a bit of HF capability, but it turns out that it only seems to work when it’s a scheduled test. [laughter] I did an exercise —we are going try to hit all of our HF nodes on a no-notice event. Turned out the person that operates it wasn’t at work that day, or the radio was in the closet and they didn’t have a key to it. And I pretty much put them back on their heels in going, “So how are you going to make that last mile of communication? Amateur Radio.”

So, as I talk about this from the public safety standpoint, I talk it about from disasters, I keep trying to remind people that the more sophisticated your systems become, the more fragile they become. This is the other term they talk about in Washington a lot: resiliency. You want resiliency? Base it upon individual nodes of communication, self-powered, of people who use it all the time in a variety of conditions, and know how to finesse systems to get through when nothing else can. Can fix stuff, have the passion of figuring out how to increase the propagation through just re-orienting or just doing a different type of antenna ray. You ask your average public safety guy? It’s just push-to-talk, if it ain’t working, somebody’s got to fix it, right? But when you talk about — think

about — a resilient system — that there is no single point of failure, that the ability to communicate across spectrums that most agencies can only dream about — think about it.

From 160 meters to almost daylight and everything in between, how many public safety agencies can even come close to that bandwidth? Or the various modes you can operate? And if there are such things as cyber wars, cyber attacks, natural disasters…degraded systems, single points of failure, Amateur Radio is the exact opposite of that. Just look at Field Day. Other than, "I can generally I can find where you're at by where the BBQ grills are smoking" [laughter, applause], but off the grid, emergency power making contacts all over the US and all over the world. Totally portable, self-contained operations. How many public safety agencies can do that? So, my argument is, the relevancy of Amateur Radio to emergency disasters and emergency services only grows. But there's another side to that. And that's the public service aspect and the hobby of Amateur Radio.

You can't perform in a disaster if you're not practicing. If you're not out there trying and experimenting and trying different things. The stuff that you use every day, it may go down. It's that ability to push envelopes, to have the skill to operate just something as routine as checking in on a net and have the radio discipline that everybody can't talk at the same time. Right? But to have a conversation with a half dozen or more folks over a net are the same skill sets we need when we've got to pass emergency information, and everybody can't be shouting, "Mine's the most important information."

The experimentation, the things we are doing with microwaves, point to

point, looking at everything from amateur television, airborne — this is one of the things we did in Florida — we put an airborne repeater up in a CAP aircraft. We flew them over Tampa at 5,000 feet — we could actually hit from Key West to Tallahassee on 2 meters — with an HT! Think about what you can do when everything else is out. And it's that whole background of, this isn't just about emergencies or disasters. It's about using the tools — using and learning about it, experimenting, and the constant questions of, "Can I get a little bit further?" Can I turn the power a little bit further down? Can I do something and get that one last station I need to get my contest results so I've got all counties worked, all states worked, all countries working — hit those random DXpeditions that are only there once in a while, and figure out how to get that signal when on a good day you only get static.

And then, when a Sandy hits, or a Loma Prieta earthquake, or whatever other catastrophe, that when people see me on TV, going, "Oh, it's gonna be bad" [laughter], then Amateur Radio takes that hobby and turns it into saving lives. So I am in Amateur Radio not because I am the emergency manager of FEMA. I am in Amateur Radio because I got bored and I live in the apartment and there's not a whole lot of hobbies you can do in an apartment. So I bought this book on electronics and it had a thing in there about building crystal radios. So I ordered the diodes, I ordered a veritable air capacitor, I took a spice bottle, and I started wrapping my coil around it, put it in. I didn't have a good ground in the apartment, so I did what you're not supposed to do — I clicked into the neutral on the wall outlet [laughter].

And the joke was I was the only apartment in Washington, DC that had a black wire about six stories up going up and down the side of the building. And I could get all the AM stations pretty good. Until I realized if I took a couple of coils off, I could get radio Havana. I'm like, this thing has a diode, a veritable air capacitor, and a coil made up around a spice bottle plugged into a ground and a wire hanging out a window, and I'm getting Radio Havana. Of course, don't tell anybody about my security clearance, they'll wonder why I am listening to Radio Havana [laughter]. But I'm thinking, if you can get Havana in Washington, DC, with nothing more than a piece of wire wrapped around something creating a coil for induction and you're using a veritable air capacitor to change that induction and that air capacitor and you can get -— this is cool.

So then I found out about regenitor radios. So I bought one of those kits. And then I was getting a lot of other interesting places. And I started finding out — there's these guys talking and I'm thinking, airplanes don't talk on HF, do they? Oh yeah, they do when they're crossing the Atlantic, so I listen to them coming into JFK and other places on their approach before they switch over to UHF and VHF on HF, with a wire hanging out my window. So that's when I decided, I have got to get my license.

And so again, I always maintain the balance between my job as FEMA administrator and the role that Amateur Radio plays in disasters as that last-mile, always-there, and when everything else fails communication. With just a fascination of how(a current moving through different devices can do all kinds of magical things and reach out. And I had my nephews in, and they're saying,

“Who is that?” And I’m going, “That’s Radio Havana.” “Well, where’s it coming from?” I said, “Cuba.” And they wanted to know where I was plugged into the Internet. [laughter] And the whole thing is running on a nine-volt battery.

So again, when I got my license and I joined this, it goes back to1987. It goes back to W4TKE, Walt Johnson, and the other hams in GARS who taught me a lot about Amateur Radio before I ever became a ham. And through a career seeing how Amateur Radio in a disaster, in a crisis, was oftentimes the one thing that was still up and running. From international disasters that oftentimes the only word we got out of Haiti was to hams down there that could transmit, o my experiences at FEMA and a growing understanding that as much as we think we’re sophisticated with technology, things break. And you’ve got to be prepared. And Amateur Radio is always that last-mile system when everything else fails. A ham transmitting can mean the difference between life and death. That’s why I’m proud to be a member of ARRL. I made sure I got my General before I came here. [laughter, applause]

And I’ve got to thank the Mount Vernon Amateur Radio club that offers every month free testing for any walk-in that wants to come in and challenge the test. To my hometown club, the Alexandria Amateur Radio Club, which every Thursday at 8 PM we do a net — that’s the first net I ever got on. They’re really friendly guys. Some people always talk about how some ham nets are closed and don’t like newcomers — Alexandria is a great club for newcomers. They made me welcome.I’m just introducing myself by my call sign and last name. They have no idea who I am and I’m not saying who I am. And so last night I got on

the net, there's usually about 8 – 10 people, there's four of us. The other four to five are here. We have a monthly — our weekly net, in Washington, DC. If you're ever there, Voices of America runs a net at 11AM on their repeater, and I can occasionally make that one, and every now and then I get back home to Gainesville and get on the Alachua County ARES on Wednesday and check in.

But I am proud to be a ham, I'm proud to be part of the organization, but most importantly, I'm fascinated by what's going to come next, what else I'm going to learn, how I can tweak a little bit more. And we need more kits out there. I like building. I don't like buying, I like building.

Thank you very much.

[applause]