The Role of Amateur Radio in Local Government Energy Assurance

pti Public Technology Institute

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Since 2006, PTI has offered assistance to local governments regarding energy assurance. During this time, with financial and technical assistance from the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability, PTI has produced two pioneering publications: *Local Government Energy Assurance Guidelines,* version 1.0 (2009); and version 2.0 (2011).

As PTI continues to better understand energy assurance at the local level, it will bring newly discovered options, strategies and opportunities to the attention of interested stakeholders. Both of the aforementioned documents highlighted communications as being one of the most--if not the most-- important aspects of planning for, responding to, and recovering from energy related emergencies or disasters. It is in this context that PTI now offers *The Role of Amateur Radio in Local Government Energy Assurance.*

Radio amateurs (also known as "amateur radio operators" or "hams") can be the backbone of local government energy assurance plans. Craig Fugate, Administrator of the Federal Emergency Management Agency (FEMA), called Amateur Radio "the ultimate backup, the originators of what we call social media. ...Amateur Radio oftentimes is our last line of defense."[1]

At this writing there are approximately 700,000 licensed U.S. radio amateurs. Most, but not all, are technical hobbyists and many of them are also part of local disaster communications support teams. They comprise a resilient, reliable option for mitigating communication losses during emergencies, including energy emergencies, particularly when telephone networks are damaged or jammed with calls. Federal regulations require amateurs at all times to give priority to emergency communications.[2]

Background

The Amateur Radio Service (often called simply "Amateur Radio") is allocated a share of frequencies by a world body, the International Telecommunication Union (ITU), part of the United Nations. According to the ITU, Amateur Radio "provides communications during natural disasters and other catastrophic events when normal communications are temporarily interrupted or inadequate for the needs of human relief operations."[3]

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[1] "FEMA Administrator Calls Amateur Radio 'The Last Line of Defense'," *ARRL News,* May 25, 2011, http://www.arrl.org/news/fema-administrator-calls-amateur-radio-the-last-line-of-defense

[2] 47 C.F.R. 97.101(c).

[3] "Techniques and frequency usage in the amateur service and amateur-satellite service," *International Telecommunication Union Question ITU-R 48-6/5,* 1978-2007.

The U.S. Federal Communications Commission (FCC) defines Amateur Radio as a "radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.[4] ... When normal communication systems are overloaded, damaged or disrupted because a disaster has occurred, or is likely to occur, in an area where the amateur service is regulated by the FCC, an amateur station may make transmissions necessary to meet essential communication needs and facilitate relief actions."[5]

The FCC supervises organizations of test proctors, known as Volunteer Examiner Coordinators (VECs), through which one can earn the license required to operate an amateur station. VEC-sponsored examination sessions are held year-round at hundreds of locations such as community centers, schools and conventions.[6]

A Non-Commercial Service

The Amateur Radio Service is resolutely non-commercial. With few exceptions, amateurs may not provide "communications for hire or for material compensation, direct or indirect, paid or promised."[7] During training, public events or emergencies, their participation must be as volunteers.

Amateur radio stations may not legally be used as a regular substitute for business radios or the public safety radios of government agencies.[8] "Regular" in this context is usually construed as routine, for example daily or weekly. Disasters and emergencies are by definition, non-routine.

One longstanding issue concerned whether hams employed by local governments or hospitals could be paid their regular salaries while operating amateur radio stations during emergency drills. In 2010 the FCC clarified that a radio amateur "may participate on behalf of an employer in an emergency preparedness or disaster readiness test or drill, limited to the duration and scope of such test or drill, and operational testing immediately

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[4] 47 C.F.R. 97.3(a)(4).

[5] 47 C.F.R. 97.401(a)

[6] The ARRL VEC exam session search is available at http://www.arrl.org/exam_sessions/search . Volunteer examiners associated with the W5YI VEC are listed at this link: http://www.w5yi.org/exam_locations_ama.php

[7] 47 C.F.R. 97 (a)(2).

[8] 47 C.F.R. 97.113(a)(4).

prior to such test or drill." It placed limitations on participation by amateurs—during their paid employment—in tests or drills that are not sponsored by government agencies.[9] [10]

Preemption of Local Antenna Regulation

Under the doctrine of federal preemption, the FCC *Station Antenna Structures* rule limits the extent to which local authorities may control the height or placement of amateur radio antennas.[11] "Since amateur radio is an activity that is foreign to many people, including those who serve on municipal councils and zoning boards, this regulation is rarely considered when antenna structure ordinances are created," a law review article observed.[12]

In view of significant litigation concerning zoning disputes over amateur radio antennas, the FCC ruled that "[L]ocal regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and to represent the minimum practicable regulation to accomplish the local authority's legitimate purpose."[13]

Licenses and Callsigns

The FCC assigns each amateur licensee a callsign that indicates the country, region and class of license. U.S. callsigns must start with the letters A, K, N or W. Because each callsign is globally unique, many state governments will issue callsigns on auto license plates in lieu of randomly assigned plate numbers or "vanity" plates.

Radio amateurs are not required to carry license documents, although each receives a wallet card license from the FCC. Unlicensed operation of a station exposes the operator to penalties that can include fines and, in egregious cases, seizure of radio equipment by FCC agents accompanied by U.S. Marshals.

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[9] 47 C.F.R. 97(a)(i).

[10] An excellent web resource on this subject is the Hospital Disaster Support Communications System, http://www.hdscs.org.

[11] 47 C.F.R. 97.15(b). This preemption is often called "PRB-1" from the designator of the FCC proceeding that developed it.

[12] "Reasonable Accommodation of Amateur Radio Communications by Zoning Authorities: The FCC's PRB-1 Preemption," Brennan T. Price, *Connecticut Law Review* 37:321, 2004.

[13] "Federal Preemption of State and Local Regulations Pertaining to Amateur Radio Facilities," 101 F.C.C.2d 952, 1985.

Local agencies that utilize ham volunteers are under no formal obligation, however, to determine whether each operator is in fact licensed. The national database of amateur licensees is public data and is easily searched on the FCC.gov website. Amateur radio clubs may verify an individual's license when he or she applies for membership.

Emergency Support Organizations

Most communities have amateur radio clubs. Although club members view their involvement as a hobby (they reach out and talk to fellow amateur radio operators from their community, around the state, nation and yes, even internationally), most are also available upon request to provide communication services during emergencies and at community events. Amateur radio clubs and communications teams typically do not "self-activate," but wait for a request for assistance from the agencies they support.

Today, the principal amateur radio organizations involved in emergency response are the Amateur Radio Emergency Service (ARES) of the American Radio Relay League (ARRL); Skywarn, a storm-spotter network supporting the National Weather Service; the Citizens Emergency Response Teams (CERT); SATERN of the Salvation Army; and the Radio Amateur Civil Emergency Service (RACES).

ARES is the most widely recognized such organization. It "consists of licensed amateurs who have voluntarily registered their qualifications and equipment, with their local ARES leadership, for communications duty in the public service when disaster strikes," according to ARRL. ARES operates according to a Public Service Communications Manual, published online.[14]

Many amateurs who participate with ARES and the other listed groups are trained in the National Incident Management System (NIMS). It provides a consistent, nationwide template to enable governments, nongovernmental organizations, and the private sector to protect against, respond to, recover from, and mitigate the effects of incidents.

Some amateur radio volunteer positions require more extensive knowledge. For example, in addition to passing the radio license exam, an amateur radio volunteer in Brookline, MA must "also become a student of weather, fire and police operations, and search and rescue teams, as well as develop a keen sense for detecting hazardous situations. All this while working at the scene of the disaster. Volunteers must also be prepared to work for

[14] http://www.arrl.org/public-service-communications-manual

up to 72 hours continuously, and maintain auxiliary power to the Operations Center in case of a failure."[15]

Equipment, Response Capability and Examples

Various forms of communication and types of equipment are necessary in order for amateur radio operators to pursue their hobby. This equipment generally falls into three categories. These are: 1) home-based communications equipment; 2) low-powered mobile or handheld radios, sometimes incorporating location tracking capability; and 3) repeater stations at elevated sites that increase the range of low-power radios.

Based on individual investment in amateur radio equipment and personal interest, operational capabilities and involvement varies. In addition to local on-air roundtable discussions on the VHF and UHF bands, many hams participate in statewide, regional, national and international "traffic nets" on the longer-range, HF (high frequency) bands. These operators practice uniform procedures that would be used to communicate health and welfare messages and information critical to saving lives or property.

Each year in late June, hams participate in Field Day, a nationwide event in which amateur stations operate off the power grid – using batteries, solar power, portable generators and temporary antennas – at campsites, emergency operations centers and other away-from-home locations. Field Day is "a competition in which amateur radio operators go to semi-remote locations and simulate emergency situations, then put their skills to the test."[16]

Such preparation was evident in May 2011 when a 200 MPH tornado hit Joplin, Missouri, and its regional medical center. A radio amateur on his honeymoon took the first emergency call from a Joplin hospital, deploying additional hams who relayed information for medical personnel involved in moving patients from an overwhelmed hospital to centers elsewhere.[17] Hams belonging to local Skywarn, ARES and SATERN

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[15] "Volunteers Prepare for Category-5 Hurricane to Hit, in a Drill," *Brookline Patch*, August 10, 2011, http://brookline.patch.com/articles/volunteers-prepare-for-category-5-hurricane-to-hit-in-a-drill

[16] "Local radio club puts emergency skills to test," *Leesville, LA Daily Leader*, July 19, 2011, http://www.leesvilledailyleader.com/news/education/x121483246/Local-radio-club-puts-emergency-skills-to-test

[17] "Amateur radio operators played valuable role in providing communication during Joplin rescue efforts," Patti Flowers-Palmer, *MyMissourian.com*, June 22, 2011, http://mymissourian.com/2011/06/22/amateur-radio-operators-played-valuable-role-in-providing-communication-during-joplin-rescue-efforts/

groups devoted hundreds of hours to hospital and Red Cross communications in the destructive tornado's aftermath.[18]

During Hurricane Katrina of 2005, "Hundreds of volunteer amateur radio operators made up the largest Amateur Radio Emergency Service army in history to provide critical emergency communications support," according to Gregory Sarratt, in a post-incident review submitted to the FCC.[19] "Our army included amateurs of all genders, ages, types and backgrounds. Many worked from home, supporting field operations; and others were field deployed in the devastated region. When needed, amateurs provided many services in addition to communications, working long hours, living in terrible conditions, contending with heat, bugs, ants and in many cases much worse. ... There should be permanent amateur radio stations built in to Federal, State and local emergency management operation centers, select public service, Red Cross chapters and other served agencies," he recommended.

Partnerships

Partnerships are vital in addressing public sector activities such as emergency response especially in this time of dwindling resources. Amateur radio clubs and allied agencies across the U.S. mutually benefit from such partnerships, some of which involve formal Memoranda of Understanding (MOU) that establish the scope of amateur participation.

At a national level, some of these partnerships and understandings are with the American Red Cross, National Hurricane Center, National Volunteer Organizations Active in Disaster, Department of Homeland Security Citizen Corps, Salvation Army and Civil Air Patrol. It is very common for club-operated amateur radio stations and repeaters to be located in city and county facilities, Emergency Operations Centers, fire stations, hospitals, and in Red Cross chapters and National Weather Service forecast offices.

Summary

Clearly, the Amateur Radio Service plays a significant, but quiet role in emergency response. It remains a resource to many public entities and communities. As the need for communication expertise during natural and manmade incidents continues, local

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[18] "ARES Stands Down After Joplin Storms, CERT Volunteers Needed," *ARRL.org*, 05/31/2011, http://www.arrl.org/news/view/ares-stands-down-after-joplin-storms-cert-volunteers-needed

[19] Operations Review Summary, Hurricane Katrina Amateur Radio Emergency Communications Relief Effort, Gregory Sarratt, W4OZK, American Radio Relay League, March 7, 2006, http://www.fcc.gov/pshs/docs/advisory/hkip/GSpeakers060306/ACT1045.pdf

governments would be well-served to access this decentralized network of established, accomplished citizen responders.

PTI encourages all communities to make contact with their local amateur radio operators and clubs[20] and set up a partnership that enhances their joint effectiveness. PTI will continue to provide meaningful information regarding this invaluable resource and offer suggestions as to how governments and emergency responders of all types can work together to plan for, respond to and recover from energy emergencies and events.

Steven J. Foute and Bennett Kobb

Public Technology Institute
1426 Prince Street
Alexandria, VA 22314
www.pti.org

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For information on local government energy assurance planning, visit PTI's LEAP website at www.energyassurance.us.

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[20] http://www.arrl.org/find-a-club