The Amateur Radio Emergency Service/Radio Amateur Civil Emergency Service: Meeting the 9-1-1 Challenge

[
Experts at creating radio networks and moving information, organizations of trained emergency communications volunteers work through disasters around the world, providing communications where no other reliable means exist.
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ON AUGUST 14, 2003, THE NORTHeast blackout revealed a potential failure in the cellular infrastructure—many cellular sites do not have alternate power supplies for extended power outages. As the power outage exceeds the battery life at the site, cell phone users find larger areas without cellular coverage. More recently, and on a much smaller scale, the Verizon DSL outage in southeastern Pennsylvania left thousands without Internet for about 10 hours. If these users had relied on this service for VoIP, this nuisance may have become a serious issue.

Fast-forward 10 years. About half of your citizens—including businesses—have abandoned wireline phones and exclusively use wireless or VoIP. Now imagine a technological failure the scope and duration of the Northeast blackout. Since it is estimated that 50 million lost power in 2003, that means approximately 25 million citizens would not have phone service to call 9-1-1.

The question becomes: how will 9-1-1 centers receive emergency calls from citizens without the means to call? One solution is to use a resource that is currently underused and, for the most part, underappreciated: the Amateur Radio Emergency Service (ARES)/Radio Amateur Civil Emergency Service (RACES) have the equipment, personnel, and commitment to meet this challenge.

ARES/RACES

ARES and RACES are separate organizations with different chains of command and somewhat different rules of operation. ARES volunteers register their qualifications and equipment for public service during disaster. ARES has a very active national leadership and chain of command down to the local level. RACES volunteers are in reality a group-affiliated government for use during disaster. RACES leadership is generally strongest at the state and local levels. Both organizations consist of trained emergency communications volunteers who have amateur radio licenses issued by the FCC. Volunteers for ARES go through the field organization of the American Radio Relay League (ARRL)—the national association for amateur radio—while volunteers for RACES register with local emergency management agencies.

The two groups routinely work cooperatively. During a disaster, ARES operators may be provid-

Above, Left: Citizen reporting incident to field operator at local fire station. **Top, Right:** Field operator completing emergency call sheet during interrogation.
Bottom, Right: Incident information is relayed via radio from field operator to Net Control.

Photos courtesy of Kay Craigie.

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ing communications between citizens within the disaster area and family around the world. At the same time RACES operators may be providing radio communications between local and state emergency operations centers (EOCs). They may, as is the case in Chester County, PA, form a joint organization that is activated as either ARES or RACES, as appropriate to the circumstances of the incident.

Upon notification by the 9-1-1 center that communications are needed in an area of the county, the ARES/RACES emergency coordinator (EC) coordinates the alerting and deployment of field operators who will take in-person requests for emergency assistance from citizens. ARES/RACES volunteers are alerted via a combination of phone calls, pager messages, and announcements on amateur radio frequencies customarily used by ARES/RACES.

Field operators are dispatched to fire stations in the area affected by telephone outage because fire stations are well marked and seldom move. They are equipped with amateur radio gear, reflective vehicle signage—which enables citizens to locate the ARES/RACES operators even at night—

and call entry sheets. In addition to operations equipment, each field operator has enough personal items—food, water, medication, and clothing—to be self-sufficient for 12 to 72 hours.

When ARES/RACES has field operators in place, the 9-1-1 supervisor sends an emergency alert system (EAS) message directing citizens who cannot get through to 9-1-1 to go to their local fire station and report emergencies to the ARES/RACES field operators. As the field operators receive requests for assistance, they are transmitted to other ARES/RACES operators on duty in the ARES/RACES radio room adjacent to the 9-1-1 center. These operators copy each message and hand the call to a 9-1-1 call taker who is acting as a runner. The call is taken into the 9-1-1 center and entered into the CAD system for dispatch. The network controllers (Net Control) are responsible to maintain the availability of radio networks being used to assure that messages are being passed quickly and accurately and to maintain staffing at each site where field operators are assigned.

Training

In addition to FCC licensing examinations, ARES/RACES volunteers are expected to participate in on-the-air training exercises and are strongly encouraged to pass emergency communications certification courses offered by the ARRL.

ARES/RACES are experts at creating radio networks and moving information. They are trained to relay information in an exact method where accuracy is the only required outcome. Relaying accurate and timely emergency calls and having amateur radio operators receive emergency information directly from the public is a concern for all involved. To overcome the apprehension of field operators—and to bring speed to the same level as accuracy—a methodical, phased approach is used to gain the support and build the confidence of the amateur radio volunteers (**see Chester County [PA] ARES/RACES Training sidebar, page 42**).

The 9-1-1 training team performs basic training on interrogation, completing the call entry sheets, and incident relay. The ARES/RACES training coordinator develops and schedules exercises that test notifi-

Because more customers are moving toward non-traditional phone service as the only means of making a 9-1-1 call, **WE NEED TO BEGIN FOCUSING ON HOW TO PREPARE WHEN THE CALL CANNOT BE MADE.**

cation, response, and call relay. A major part of the basic training is practical scenarios, which train for speed. Two important messages are mentioned at each training session for field operators:

1. If this plan is ever used, every safety measure in the system has failed and this is the last means of reporting an emergency for many of our citizens.
2. Because this is the last resort, failure is not an option.

Practicing these scenarios with field operators can alleviate call takers' concerns about taking information from distraught citizens. At the recommendation of the CCAR training coordinator, field operators are provided additional practical time with the 9-1-1 trainer. The number of scenarios and time is dependent on the field operator's level of proficiency and desire for additional training. Each field operator has the opportunity to sit with a 9-1-1 call taker to observe the call taker's interrogation methods. By observing a 9-1-1 call taker, the field operators have the opportunity to hone their skills by listening to actual interrogations. This experience also reinforces the concepts learned during the emergency call training. Training is continued with updates about every six months.

Meeting Challenges

ARES/RACES operators have worked through disasters around the world to set up and staff radio networks to provide communications where no other reliable means existed. As with all resources, the availability and operational readiness of both organizations vary greatly throughout the U.S. In general, those areas that are affected by disaster most frequently have the most active groups. Their mobile nature and ability to move information during adverse conditions makes this group of highly trained, highly motivated professionals ready to meet the challenge regardless of adversity.

Technology must be balanced with the ability to cope with technology failure. There is alternate call routing, maintenance of redundant power supplies, and even backup PSAPs. Everything possible is done to make certain that when an emergency call is made, communications centers are able to receive it. Because more customers are moving toward non-traditional phone service as the only means of making a 9-1-1 call, we need to begin
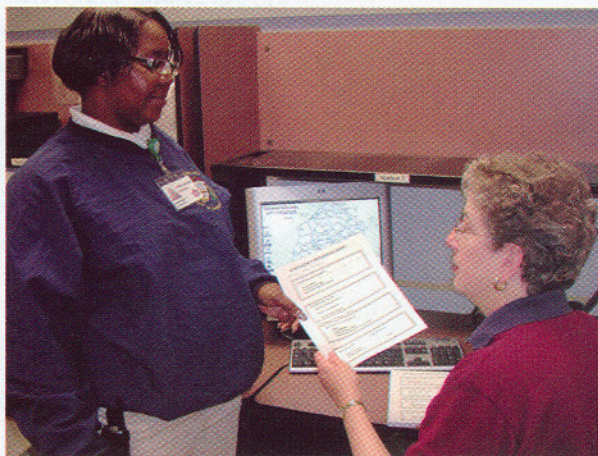
Left: Net Control receives incident information.
Top, Right: Call information is given to 9-1-1 staff for entry into the CAD system for dispatch.

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Chester County (PA) ARES/RACES TRAINING

CHESTER COUNTY HAS FOUND THAT PREPARING FOR AND PARTICIpating in annual nuclear power plant drills and the national weather exercise are not enough to maintain interest and operational readiness. By expanding the role of the amateur radio operators to include direct involvement with citizens during catastrophic phone outages, they have increased not only the awareness of the potential hazard, but also the activity and training level of the ARES/RACES organization.

For example, when instituting a phone outage plan, Chester County's first step was to bring the concept to a Tech Rally—a monthly meeting of the Chester County ARES/RACES (CCAR) group members. At this meeting the rationale and general concept of the phone outage plan were discussed. Since the major activity of CCAR has historically been to provide back-up communications from the county emergency operations center (EOC) to municipal EOCs during nuclear power plant drills, this presented a dramatic change in how many members of the group saw their mission. This rally was the first step in gathering comments and concerns to be used in developing the training program. The second step involved 9-1-1 and ARES/RACES staff developing a reporting form, which met the requirements of call taking and the reality of being completed in a vehicle in adverse conditions, by staff unaccustomed to doing emergency interrogations. The result is a one-page form with five separate sections:

- The incident number
- Incident location
- Incident type (at this point the incident is relayed to the ARES/RACES radio room)
- Reporting party information
- Time received and transmitted

To build support among the amateur radio operators, a systems test is conducted during which members are sent to fire stations and report in via radio to the Net Control.

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focusing on how to prepare when the call cannot be made. ENPM

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ARES is a local unit of the American Radio Relay League's (ARRL) national volunteer field organization. Contact information is available from the ARRL at (860) 594-0265 or emergency@arrl.org. RACES is sponsored by state and local emergency management and is governed by the FCC's Rules at CFR 97.407.