

Building the Amateur Radio Emergency Network (AREN) for Central Virginia Hospitals

In the first article I pointed out the three linked-repeaters that give us the 10,000 square-mile (26,000 square-kilometer) coverage we need to connect all seventeen hospitals and the area blood service. This is how we put it together.

Finding the Need

On a pleasant spring morning after church, my friend Carleen Penny asked what I knew about using ham radio for emergency communications in hospitals. “Not much”, I said, “but I’ll see what I can find out”. Mrs. Penny was a member of the emergency preparedness committee and the expert on the HEICS organization for the region’s “Level One Trauma Center”. She’d heard about using hams at meetings with other hospitals in areas that deal with lots of tornado and hurricanes. Around here we had the occasional leftovers from hurricanes, but ice storms and mass casualties from I-95 and the heavily used railroad lines are the major worry. Her question led to the ham radio demonstration described in the first article.

Making the Connection

In our case, the hospitals found us. Most of us hams see emergency communications as serving government emergency operations centers (EOCs). We didn’t know the hospitals needed us! Here there are a lot more hospitals with command centers (17 and growing) than government centers.

If you want to find hospitals for your ham organization, find the “Level One Trauma Center” in your area. Work your way to the emergency committee. From there you’ll usually find a multi-hospital disaster planning group. In our case it’s in the Virginia Hospital & Healthcare Association.

Tony Amato, KR4UQ, the head of our AREN ham organization (the non-profit Virginia RACES, Inc.) and Don Shindel, the coordinator of the disaster planning group for the hospital association, got together. That’s where “ICS” enters the picture.

Organizing with ICS

It’s nearly universal; emergency organizations in North America use ICS, the Incident Command System. You can learn more about it at <http://www.nwcg.gov/pms/forms/compan/history.pdf> and take free online training from FEMA at <http://www.training.fema.gov/emiweb/is/is195.asp>. It has been so successful that hospitals developed their own version called HEICS (Hospital Environment ICS). For more on it see <http://www.heics.com/download.htm>.

If you’re going to get hospital support and funding, you need to show your organization follows the ICS structure. Whether yours is an independent AREN organization like our non-profit Virginia RACES, Inc. or an AREST™ group, you need an ICS structure, not a loose group of interested hams.

The diagram (Amateur Radio Emergency Network for Central Virginia Hospitals How Built Chart) shows the HEICS structure. Notice that ham radio is three levels down. That’s where we hams report during a drill or an emergency.

Your ham radio organization needs an organization very similar to the diagram with the “chiefs” and “leaders”. You need names assigned and assurance that they have some training and/or experience to do those jobs. The hospitals need to know that yours is a tight organization and not just a bunch of hobbyists.

Proper Forms and Messaging

If you've been a ham for a while, you know about radiograms. Forget them; hospitals don't want you to use them. It's strictly ICS form 203 or a close derivative like that shown in (203-form photo). It's plain text with the signature and title of the sender but we adapted it to added a kind of word count to make resending quicker. In the first article I noted that “Packet is King”. To put it all together, we made the packet message form for our modified JNOS look like the ICS 203 form. (Screen shot.)

Voice (phone) is still important. Sometimes an official at one hospital needs to have a “meeting” via radio with officials at other hospitals. Much ham logistics takes place with voice. Although UHF packet is pretty reliable, VHF voice is backup for those propagation situations when digital can't get through. Hams with hand-helds can serve as shadows to hospital staff outside the command center. Hams with their personal transceivers can ride ambulance duty. We can stand near the emergency room entrance when internal communications are overloaded or damaged. It all contributes to our reputation as hams getting through no matter what.

Getting the Money

To start, \$300,000. We didn't buy the equipment, the hospitals did. When you're dealing with that much money, you need the pros who can pass government audits. That's hospital finance staff, not hams having fun.

We did the experiments to understand the propagation challenges, we got a member with professional radio skills to put together the design, we supplied the specifications, we helped fill out the purchase orders, and we tracked the equipment as it arrived. See why the hospitals needed for us to have an ICS structure? We need planning, finance, and logistics chiefs just like the hospitals.

We started before the September 11th terrorist attack on the Twin Towers and the Pentagon. That disaster caused a year's delay but in the end it provided a more direct way to get funding. The Virginia Department of Health used grants from the Bioterrorism Hospital Preparedness Program (BHPP). The hospitals own the ham gear and Virginia RACES holds the FCC licenses as the official trustees, much like a repeater association.

Building the Network

What do you know about pliable roof membranes? Can you run emergency power, telephone lines, and Internet links past all the elevator equipment to the top of the hospital and meet all the codes? Do you have the skilled hams with the spare time to install nearly 80 heavy commercial antennas on top of the hospitals? Did you get the grounding right? How's your liability insurance if an antenna falls or the roof leaks?

For all the antennas we found, and the hospital association hired, professionals to do that work. The repeaters were built to our design by Pacific Research (<http://www.pacres.com/>). They build

commercial repeater systems. Hams volunteered their time to install the repeaters, controllers, and power supplies in the racks and connect the antennas. Then the engineers from Pacific Research came to town, applied power (no smoke ensued!), and trained us to use them.

We hams installed the transceivers in the radios rooms, connected the antennas, and ran the tests.

Getting to the Hospital

It seems simple enough; get in your car and drive to the hospital when you're deployed. Then you hit your first checkpoint. How do you convince the policeman that you should cross the cordon to the hospital? My hospital ID gets me through. Those certified as trained in our program get the appropriate picture ID. The reality is that in a major disaster we'll need "untrained" hams to assist those with official training to handle all the days and shifts. As our Emergency Radio Officers deploy them, we tell them to bring their best picture ID and their wallet FCC license. Then we put them on a list that we give the the HEICS security chief in the hospital's command center so he or she can tell the police officers at the checkpoints who to let in. The security officers tell us there's no way to talk your way in.

Training Hospitals and Hams

"Net control, this is W4VCU". Most hams aren't experienced in using net control, we're a little rusty on phonetics, and we certainly don't know how to protect ourselves in a medical environment. Those are what we teach in the class. It's a mixed ham and hospital staff class. Therein lies a problem. Hospital emergency staff work Monday through Friday during the day. Most hams are available on Saturday mornings or Sunday afternoons. Although we got large and enthusiastic groups of hams to our classes, we couldn't get all the hospital staff we needed.

To solve the class attendance problem we've developed videos and computer slide shows for the training. Both ham experts and hospital emergency staffs contribute to the contents of the videos just as they did to the classes. Both groups take the classes. We've developed tests to make sure we all "got it".

For the hams we also run communications drills once or twice a year so we remain current on using net control. As with the classes, it tough to get hospital-run drills that go into the night so hams can participate. We have retired or otherwise-independent hams participate in the daytime drills. We do what we can.

The Payoff

We finished the drill. I asked the our lead ham volunteer at one of the hospitals what he thought of it. "Great! When's the next class"? Even if it's only a drill, the feeling of accomplishment is very satisfying. For me, at least, the opportunity to be part of the solution in a medical emergency is especially rewarding.

How to Do It Yourself

We'd like to see more groups form to serve hospitals. To learn more, contact the head of our AREN, Virginia RACES, Inc., at sero@varaces.net (SERO is State Emergency Radio Officer). We have

accumulated so much information that we need to know just what you need and, if we have it, we'll share it. Where the information is available from a hospital, the hospital association, or the Virginia Department of Health, we'll help you contact them.

Author

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