



Arapahoe County Amateur Radio Emergency Service After Action Report

Date of activity: November 30, 2006

Statement of problem
Description of Exercise Scenario

Operation Armory Handshake was a communication exercise developed by the State EOC to simulate a blizzard situation and the need to set up communications net that covered multiple locations with practice radio traffic back to the State EOC. This also included multiple modes of operation to see how they all would work. Due to the wide area of coverage this involved most of the ARES districts in a cooperative effort.

Duration of activity: 2.5 hours

Serving amateur radio groups participating: Arapahoe County D22

Served agencies participating: Cunningham Fire/Arapahoe Sheriff's Office

Describe served agency participation: Provide use of the Mobile Command post to ARES District 22. This included the use of both amateur radio and the public safety 800 MHz radio system.

Number of Amateurs participating: 9

List of amateurs participating (optional): KC0VES DAVID
N0MYJ JERRY
N0NJM GEORGE
KC0LIX DICK
AG0S GEORGE
KC0VAU PETE
KC0VAQ PETER
N0POH WAYNE
W5VSI MIKE

Person-hours of Amateur service: 22.5 hours

Describe goals of activity, both for served agency and serving group. The Goals were as follows:

1. Use of Mobile Command Post to further test and verify amateur radios are operational.

2. Practice using IC-205
3. Practice using IC-214 Unit Log.
4. Practice with multi-district coordination.
5. Practice amateur radio communications on various frequencies and with various modes.
6. Practice Net control and radio discipline.

Pre-exercise Activities
 Did the event fulfill the goals?
 Explain:
 What went well:

N/A
 Yes

Things that went well:

1. Getting multiple districts together to practice communication skills.
2. Cooperation of Arapahoe County Sheriff's Office in allowing Arapahoe County ARES the use of the Mobile Command Post.
3. The turn out of 9, plus other additional members assisting at the State EOC, radio operators to assist on a communications exercise at mid day during business hours.
4. I was impressed with the ICS-205 form having repeater and simplex frequencies, VHF and HF digital frequencies, as well as, HF SSB frequencies. This well-rounded approach gives many opportunities for the message to get through.
5. With the exception of an antenna issue, the Mobile Command Post was functional on the requested amateur VHF and 800 MHz. frequencies.
6. George, N0NJM, was our Net Control Operator and he did a great job of talking on the radio and listening to 5 frequencies.
7. D22 members I believe had the

BEST HF signal reports around the state.

8. Dick, KC0LIX, was the fixed HF station at the Mobile Command Post. Dick set up his truck in near vicinity to the mobile command post and that worked very well.
9. We were able to establish a resource net quickly with N0MYX. At one point, we had antenna problems and Net Control was passed back to Jerry while we fixed the problem. This went very smoothly.
10. Dick, KC0LIX, has an excellent portable generator set up for his truck.
11. George, AG0S, was our mobile HF station. George seems to have a portable NVIS HF antenna design that we should study and copy. According to George's IC-214 report when he was talking on HF to Grand Junction on the vertical antenna his signal reports were about S4-S6. When George set up his portable NVIS the same contact on the same frequency reported to George that his signal was S9 to 20 over!
12. Pete, KC0VAQ, and Peter KC0VAU, were the roving VHF/UHF operators. I was very proud that they were able to deploy and make repeater contacts with us at the Mobile Command Post and the State EOC.

Areas needing improvement

1. The ICS-205 called out many frequencies as primary and secondary and six modes of operation. The ICS-205 serves as your guide to where you are

to communicate and what your back-up frequencies are. During a normal operation we would use the primary frequencies until some failure then switch to the secondary frequencies. I believe there may be some confusion about that and we should continue to practice making ICS-205 forms and implementing them.

2. There was a problem with the State EOC's digital mailbox. This prevented us from connecting and successfully sending digital communications. Dick, KC0LIX, was able to see others and communicate with them. Dick did report some volume/procedural issues with the users and beaconing stations on the cluster. So, we need to continue our practice with how to properly use the packet cluster, as it has great potential for ARES use.
3. One of the main goals was to try and get a communications on all frequencies and modes. We were not able to communicate from the field armory sites to the State EOC on simplex. I do not know why we couldn't, but suspect possible radio programming, antenna type, antenna height, power.... The State EOC did throw one oddity on the simplex frequency and that was a 100. Hz PL tone. This was done to eliminate possible interference issues. The use of simplex frequencies is important should be considered during every event/incident.
4. The State EOC set up the

exercise for everyone to communicate with them. In reality that span of control is way too high and based on the distances involved probably not practical. A more practical approach might look like this; the field units may be operating together on a simplex frequency reporting back to a unit leader. The unit leader may have HF/VHF/UHF that can reach back to the County EOC. The county EOC would then be in communications with the State EOC.

Lessons learned

1. We were operating two exercises simultaneously on multiple frequencies, both Public Safety and amateur. We found that having 4 public safety radios and 5 amateur radios frequencies operating at the same time can lead to some confusion as to who is talking to you on what frequency. I recommend that each person has a set of headphones that can be plugged into the D700 radios. This will isolate noise and make it easier have good radio discipline.
2. Assign two operators and possibly a scribe to the Mobile Command post. This will provide the minimum staffing to operate the two radios on multiple frequencies and modes. This also provides for a relief operator to be present to take over if one of the primary operators needs a break.
3. Knowledge of your radio's configuration is important. The Public Safety radio cabinets in the Mobile Command Post have

the radio programming chart listed on the upper cabinet doors (on the inside). This made finding the requested frequencies easy. I recommend that we do the same for the amateur radios. Randy Councell has given me the blessing to post our D700 programming or other items on the inside of the cabinet doors above the amateur radio positions. I will also follow-up with Greenwood Village and Aurora to see if ARES can do the same in their command posts.

4. When setting up your communications plan, include those home fixed operators as back-up Net Control Operators just in case you experience a problem and have to go off air to fix it.
5. We experienced an antenna problem with the D700 radios. When we began the communication exercises, we needed both D700 radios and noted they were on HIGH power. As George, N0NJM began to communicate the left VFO on the left radio began to squeal. The squeal got worst and that lead the shut down of one of the radio's VFOs. We were able to get the radio tech. over to the mobile command post and found that the D700 antennas were only 6 inches apart; and we were broadcasting at 50 watts. The radio tech. moved the antennas apart. George, N0NJM, lowered power to MEDIUM and everything began to work

normally. So, until we know that we have the proper separation; if you need both D700 radios operate them on MEDIUM power. The word also needs to get passed to the other 4 mobile command posts so they can fix the issue as well.

6. We need to consider adding to the programming of the D700 radios the CRA 447.575; simplex 446.025 100 PL; and 147.570 100 PL to the programming in all Mobile Command Posts, as I understand these will be the common State EOC utilized frequencies. The word also needs to get passed to the other 4 Mobile Command Posts so they can fix the issue as well.

Additional training needed

1. Dick, KC0LIX, has a great portable Honda generator setup. We should study that setup further, especially the generator. This could be an excellent type for folks to consider as these new Honda generators all billed to have the cleanest sine wave for power, and they operate very efficiently on the gasoline.
1. Practice setting up and using ICS within our own amateur group on exercises. This would give members practice and refresher on various ICS positions.
2. Practice assignment of 3 operators to a Command Post for proper staffing. This is dependent upon the served agency's need and available room in command post.

3. Practice D700 programming.
How many members know how to shut down a single side of the VFO? Also, place D700 instructions in cabinet above amateur operator position.
4. Practice good use of tactical call signs and radio discipline.
5. Practice proper use and radio discipline of 800 MHz. radio system, utilizing radios in command post.
6. Practice making IC-205 Communication plan forms with various frequencies and modes of operation, including nationally recognized emergencies frequencies. You never know when a repeater may just shut down.
7. Practice making and turning in proper completed IC-214 Log forms.
8. Practice packet operations with good discipline and patience. Packet is a slow mode. Knowing how to directly connect to a station, using the “connect” or “via” command, and routing through other digipeaters are important skills to know.
9. Practice setting up the internal packet mailbox on the D700's in the command post. Establish a mailbox naming system for each radio in the three command posts that we support.

Changes in the Emergency Plan
Other Corrective Actions
General comments
Ideas for future exercises

1. This type of exercise is so important and valuable that we need to do it again. Not only to fully test all the modes, but it is a great way to see how the many modes will work and try them out.

I think we should consider every time we roll out that we set up HF voice/digital and VHF/UHF voice/digital. This makes a very efficient and comprehensive communications net. Should one mode fail the other modes are already up and operational and switching over can be very smoothly accomplished.

2. We need to study George's (AGOS) portable NVIS antenna and have NVIS class/antenna party and try it out.
3. We may want to consider some information or class on generators and power. This may help members to determine best strategy for themselves and the district.
4. To accomplish the idea of rolling out more HF voice/digital we need more operators. We need to consider a "General" class and see if we can get some of our members to upgrade their license class.

Report submitted by:
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