

Emergency Radio Communications Drill

October 17

2009

Twenty-six City of Berkeley neighborhood groups participated in the city-wide emergency radio communications drill on October 17, 2009. The drill was intended to allow participants to practice emergency radio communications in an exercise setting and to evaluate expectations on the use of handheld FRS/GMRS two-way radios in a disaster.

**After
Action
Report**

Executive Summary

Radio communications can become an important alternate method of communication if traditional telephone and cell phone lines are disrupted. The City of Berkeley Office of Emergency Services (OES) held an emergency radio communications drill on October 17, 2009 in Berkeley, California. The scenario involved a city-wide emergency that included the loss of regular emergency communications through telephone or cell phone systems. This exercise allowed the OES to determine how effectively alternative communications to the City's Emergency Operations Center (EOC) through low-powered portable radios, through volunteer HAM radio operations, and through runners to fire stations could be implemented.

Strengths

Key strengths identified during this exercise include the following:

- Participants were able to react and adjust to shortfalls in the effectiveness of communications over the radio to the EOC.
- Messages delivered by runner to fire stations and relayed by HAM radio were effectively transmitted to the Emergency Operations Center.
- Participants developed a clear understanding of the limitations of low-powered handheld radio communications as a means of emergency communications.

Areas for Improvement

Throughout the exercise, several opportunities for improvement in the implementation of radio communications as an alternative means of emergency communications in the City of Berkeley were identified. Major recommendations include the following:

- Because firefighters will not likely be in stations in a large scale earthquake scenario plans for access to fire stations should be clarified.
- Radio channel Band Plan should be clarified.
- Expansion of exercise participation to include Fire Department station personnel should be implemented to broaden the awareness of possible emergency communications procedures for the public and for first responders.
- Improved advertising of the drill to solicit broader neighborhood and community organization participation should be implemented.
- Radio Communications education should be made available to facilitate appropriate use of equipment and proper communications procedures over the radio.
- Radio 1610AM may not have sufficient strength to reach many in-home radio receivers.

The results of this exercise should be used to frame expectations on the most effective use of alternative emergency communications needs within the City. Subsequent exercises should test specific improvements instituted as a result of this exercise and should include a focus on localized use of low-powered radios at the neighborhood level.

Chapter 1: Exercise Overview

Exercise Name: 2009 City of Berkeley Emergency Radio Communications Drill

Duration: 2 hours

Exercise Date: October 17, 2009

Sponsor: City of Berkeley Office of Emergency Services

Type of Exercise: Drill

Funding Source: N/A

Program: Community Emergency Response Training

Focus: Response

Classification: Unclassified

Scenario: Other: Earthquake

Location: Berkeley, CA

Participating Organizations:

City of Berkeley neighborhood residents

City of Berkeley Office of Emergency Services

Berkeley Fire Department

NALCO ARES

Number of Participants:

26 neighborhood representatives

2 City of Berkeley Office of Emergency Services staff

7 Northern Alameda County Amateur Radio Service (NALCO ARES) volunteer ham radio operators

7 Berkeley Fire Department Fire Station personnel

Exercise Overview:

The City of Berkeley Emergency Radio Communications Drill was a 2 hour city-wide drill designed for neighborhood Community Emergency Response Training participants. The drill was advertised via mass emails and at presentations and CERT classes leading up to the exercise. The drill was open to any participant within Berkeley who obtained a two-way FRS/GMRS radio. Participants were provided with a participants

guide detailing the drill timelines and providing basic radio communications basics via email prior to the exercise. There were no pre-drill meetings and all participation was coordinated through email.

Twenty-six neighborhood groups registered and participated. Office of Emergency Services staff coordinated roll call and the exercise timeline. Northern Alameda County Amateur Radio Service (NALCO ARES) volunteers provided HAM Radio communications support from each of the 7 Berkeley fire stations. On-duty fire suppression staff tested communications from the fire stations through FRS/GMRS radios.

Exercise Evaluation:

The drill was a three part exercise. Goals included evaluating radio transmission and reception from the City's Emergency Operations Center location to locations throughout the city, familiarizing participants with their local fire station's possible role in emergency communications in a disaster and to provide an opportunity for participants to practice localized communications over the radio within their neighborhood fire districts.

A post exercise evaluation survey was utilized to obtain feedback from neighborhood participants and to analyze drill effectiveness. OES and Fire Station personnel involved in the exercise at the EOC and at Fire Stations provided exercise evaluation and observations to be integrated into the after action report.

Chapter 2: Exercise Goals and Objectives

The exercise goals established for the City of Berkeley Emergency Communications Drill were met during drill play. Through completion of the objectives, participants demonstrated effective understanding of scenario events.

The following design objectives were used in the drill:

1. Evaluation of radio transmission and reception from the City EOC. Although reception and transmission success from the City EOC was not strong, the discovery of this deficiency satisfied the evaluation objective.
2. Familiarization with local fire stations and its role in alternative emergency communications.
3. Exposure to localized neighborhood emergency communications over the radio.

Chapter 3: Exercise Event Synopsis

Scenario

A large scale earthquake or other city-wide emergency that eliminates regular emergency communications by telephone impacts the city. The scenario necessitates alternative emergency communications through low-powered hand-held radios, through local volunteer HAM radio operators at fire stations and through messenger runners. On October 17 at 9am, the City's Emergency Operations Center broadcasts on a pre-designated emergency call channel on the FRS radio band to obtain situation and status reports from neighborhoods throughout the city.

Drill Timeline

0900hrs	Welcome from "Fire Control", located at the City's Emergency Operations Center (EOC) at 2100 Martin Luther King Jr. Way "This is a drill."
0905hrs	Fire Control begins Roll Call on Channel 9 PL 9
0915 hrs	Roll Call repeated for groups that did not respond originally. Fire Control I initiates relay messaging, if necessary.
0930hrs	Communication or delivery message to local fire station / Ham Radio operator will be at the station for receipt of message. Ham Radio operator transmits message to Net Control at the EOC.
1000 hrs	Participants change to a designated radio channel based on Fire District to communicate with other participants in the same Fire District.
1015hrs	Fire Control begins Roll Call for status check on Channel 9 PL 9
1030 hrs	Fire Control signs off. "End of Drill."

Chapter 4: Analysis of Mission Outcomes

OES staff was unable to copy most of the incoming radio transmissions from drill participants from the City's EOC. During the 9:05am Roll Call, only six of the twenty-six participant communications were received at Fire Control. Of those six, only two were of relative clarity; others were broken or had considerable static. Line of sight necessary for use of FRS/GMRS technology was determined to be less than effective from the EOC location.

Due to previous radio drill exercises and past practices on the assignment of radio channels, some participants expressed confusion regarding specific plans that the City has for utilizing FRS/GMRS technology in a disaster or emergency. A Radio Band Plan that is specific and that combines stability with flexibility should be developed and education on this topic disseminated.

During the exercise, a directive from Fire Control to participants to listen to Radio 1610AM was communicated via relay from the Panoramic neighborhood participant. This action was not pre-scripted and most participants successfully completed this objective. Reports from participants made it evident that the broadcast reception strength for this AM station was insufficient to many parts of the city. The output strength from this broadcast is regulated and cannot be increased and therefore, education on this limitation will be necessary to inform residents.

Conclusion

This drill was successful in furthering an understanding of the limitations of FRS/GMRS radio communications for use in emergency communications within the City of Berkeley. The exercise also served as a valuable training opportunity for participants on the basics of radio communication. Additionally, exercise participants were able to:

- Gain awareness of local fire stations and fire districts
- Gain an understanding of the function of HAM radio operators in emergency communications.
- Benefit from practice of radio operation and communication on the radio.
- Learn about the limitations regarding transmission, reception and interference inherent in emergency radio communications in a disaster.
- Connect and communicate with other participant neighborhoods in their local area.

Exercise participants met all the planned drill objectives.

Exercise participants and evaluators identified several areas for improvement in planning for emergency radio communications on the radio. Among the most critical were the clarification of expectations on use of this technology for emergency communications and the clarification of a Radio Band Plan designating call channels. These improvements are essential in coping with the inherent limitations of radio communications as an alternative in a disaster.

Improvement Plan Matrix

Task	Recommendation	Improvement Action	Responsible Party/Agency	Completion Date
Education on Radio Communications and Radio use	Radio communications protocol and equipment education would improve user proficiency.	OES is planning on adding a Radio Communications curriculum to its CERT classes	Berkeley Fire Department/ OES CERT Program	Spring, 2010
Education on Radio 1610AM as a source of Emergency Information	Radio 1610AM as a source of emergency information and the limitations of this media should be reinforced.	Provide education on Radio 1610AM to the public through CERT public safety presentations and community contacts.	Berkeley Fire Department/ OES Staff	Ongoing
Increase Participation in Future City-Wide Drills	Advanced lead time and broader publicity should be utilized to increase participation in future drills.	Targeted and broad notice to interested parties will be provided with more advanced notice for future events.	Berkeley Fire Department/ OES Staff	Ongoing
Specify Basic Plan for Emergency Communications	A Radio Band Plan, a plan for fire station access, and/or appropriate expectations should be communicated to the community.	Develop a stable basic outline of expectations to provide to the community regarding alternative emergency communications in a disaster.	Berkeley Fire Department/ OES Staff	Summer, 2010