After Action Report
Communications Outage Exercise

Cupertino
ARES/RACES

1. Overview

Description: Communications Outage, Packet Edition
Event Date: 7 May 2016
Report Date: 31 May 2016
CARES Event: CUP-16-40T
RACES Event: CUP-16-40T
Control: Cupertino ARES/RACES
Report Revision: 1.0, **IN REVIEW**
Submitted by: Jim Oberhofer KN6PE

Requirements for Reporting[1]
Completing an After Action Report is part of the required SEMS reporting process. The Emergency Services Act, Section 8607 (f) mandates that the Office of Emergency Services (OES) in cooperation with involved state and local agencies complete an After Action Report within 120 days after each declared disaster. Section 2450 (a) of the SEMS Regulations states that, "Any city, city and county, or county declaring a local emergency for which the governor proclaims a state of emergency, and any state agency responding to that emergency shall complete and transmit an after action report to OES within ninety (90) days of the close of the incident period as specified in the California Code of Regulations, Title 19, s2900(q)."

CARES will follow this requirement for reporting the results and recommendations for this Training Event.

i. Introduction and Background

Terms

CARES:	Cupertino Amateur Radio Emergency Service, ARES/RACES organization supporting the City of Cupertino.
CCC:	Cupertino Citizen Corps; the City's umbrella organization for CARES, CERT, and MRC.
CERT:	Community Emergency Response Team; trained members who can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help.
DOC:	Department Operations Center. Manages the overall field CCC deployment; aggregates data to be passed to the EOC. Advises EOC Staff on CCC capabilities, readiness, and activities.
MRC:	Medical Reserve Corps; volunteers who are practicing or and retired physicians, nurses and other health professionals, as well as other citizens interested in health issues, who are eager to volunteer to address their community's ongoing public health needs and to help their community during large-scale emergency situations.
NCO/NCS:	Net Control Operator / Net Control Station. The control function that ensures the efficient passing of messages between stations on the frequency.

[1] http://www.caloes.ca.gov/cal-oes-divisions/planning-preparedness/after-action-corrective-action-reporting; http://temp.caloes.ca.gov/PlanningPreparednessSite/Documents/01%202450.pdf

PSAP:	Public Safety Access Point; a call center responsible for answering calls to an emergency telephone number for police, firefighting, and ambulance services. Trained telephone operators are also usually responsible for dispatching these emergency services.
RRO:	Radio Room Operator. The position that originates and receives messages for exchange with field responders.
Served Agency:	An agency, special district, or other recognized organization with which CARES has a signed Memorandum of Understanding to assist in time of need.

Introduction

The City of Cupertino supports testing the community emergency response plans and ongoing disaster preparedness readiness as an essential component to a successful community disaster response. One aspect of disaster preparedness is the on-going evaluation of risks that the City may encounter, and the plans and processes that are developed to respond to and mitigate the risks. This report describes the exercise results in response to one such risk.

In October 2015, the *Cupertino Communications Risk Report*[2] was developed and delivered to the City that outlined several risks to city communications, one being the loss of telephone service and the inability for city residences to dial County 911 Emergency Services. This problem is complicated for Cupertino given the City contracts with Santa Clara County for its dispatch (PSAP) and public safety services, and County Communications facility is outside the jurisdictional boundaries of the City making access difficult for City Responders. While the probability of events leading to such a communications loss is low, it is still a plausible risk that warrants a plan on how to deal with it in the event it does occur.

In November 2015, CARES held a Communication Outage Exercise to test some of the initial ideas on processes and procedures on how Cupertino Citizen Corps and the City's Public Safety partners would respond to and handle an extended loss of two-way public communication services including commercial telephone service (POTS), cellular phone, and/or Internet connection to public safety services by way of 9-1-1. While that exercise confirmed that emergency 911 handoffs from the City to Santa Clara County Communications works, passing messages by voice was time-consuming and inefficient, in particular when there was a backlog of 911 traffic to pass.

The May 2016 exercise was a repeat of the communications outage scenario, but this time 911 traffic was passed digitally by Amateur packet radio. The City of Cupertino authorized this drill with training activation number CUP-16-40T. This report covers the activities undertaken by CARES and the findings from that drill.

ii. Type / Location of Event / Drill / Exercise

Event Type:	City of Cupertino, CARES Training Activation
Event Identifier:	CUP-16-40T
Event Name:	Communications Outage, Packet Edition
Location:	City of Cupertino

iii. Description of the Event / Drill / Exercise

CARES drill objectives:

1. Exercise packet message passing procedures.
2. Exercise message passing and message net procedures.
3. Exercise the amateur radio packet equipment at the SCC Fire Stations located in the City.
4. Exercise full end to end (Field to Dispatch) emergency packet message delivery.
5. Exercise Comm Van to DOC information handoffs.

[2] http://www.cupertinoares.org/docs/CupertinoCommRiskReport.pdf

Event resources came from the following organizations:

1. Cupertino ARES/RACES: Responsible for staffing the EOC, DOC, Communications Van, and Field Responder locations. Twenty-five (25) CARES members participated in the exercise.
2. CERT: Responsible for staffing the Field Responder locations. Eight (8) Cupertino CERT members participated in the exercise.

Volunteer Responders

Name	Call Sign	Assignment	Organization
Aberg, Fari	KF6UVS	Field Responder, Blackberry Farm	CERT/MRC
Ataee,Iris	--	Field Responder, City Hall	CERT
Blaine, Dick	K6ODK	Field Responder, Main Street	CARES
Blaine, Sharon	--	Field Responder, Main Street	CERT
Bluhm-Stieber, Hella	KJ6OHF	Field Responder, Senior Center	CARES
Capener, Chris	AI6CC	Field Responder, Lawson ARK	CARES
Cascone, Bob	KJ6WBF	DOC	CCC/CARES
Eschelbeck, Gerhard	N6ESC	Field Responder, City Hall	CARES
Eschelbeck, Lisa	N6EEL	Field Responder, City Hall	CARES
Frieson, Doug	KJ6LLY	Field Responder, Sears	CARES
Goette, Gerd	KI6WEJ	DOC	CCC/CARES
Gontang, Allan	KD6QPP	Net Control Operator	CARES
Halchin, Judy	KK6EWQ	Shift Supervisor	CARES
Hill, Steve	KK6FPI	Field Responder, Seven Springs Fire	CARES
Leung, Ho-Ming	KK6YUT	Field Responder, Seven Springs Fire	CARES
Levine, Rick	KK6WHJ	Field Responder, Quinlan Center	CARES
Levine, Sue	KK6WHI	Field Responder, Cali Plaza	CARES
Oberhofer, Jim	KN6PE	Radio Room Operator	CARES
Presley, Darryl	KI6LDM	Field Responder, Cali Plaza	CARES
Rajaram, Sidharth	KJ6ZKU	Field Responder, Sears	CARES
Rajaram, Soundararajan	KJ6ZKT	Field Responder, Sears	CARES
Ramakrishnan, Kala	--	Field Responder, Blackberry Farm	CERT
Ross, Betsy	--	Field Responder, Senior Center	CERT
Sherman, Dick	N6IK	Field Responder, Blackberry Farm	CARES
Stephens, Skip	WA6VFD	Field Responder, Main Street	CARES
Swann, Anu	--	Field Responder, Lawson ARK	CERT
Tallinger, Beverly	--	Field Responder, Quinlan Center	CERT
Tallinger, Jerry	--	Field Responder, Post Office	CERT
Tanner, Brian	AG6GX	Field Responder, Cupertino Fire	CARES
Tanner, Mary	KI6GCX	Field Responder, Cupertino Fire	CARES
Trollman, John	K6HVJ	Field Responder, Post Office	CARES
Wang, Judy	KI6WEF	Field Responder, City Hall	CARES
Woodmansee, Peter	WB6POT	Field Responder, Senior Center	CARES

3. City Staff: Additionally, City Staff members were present and responsible for the following:
    a. OES Logistics. One staff member performed logistical support for deployed field teams.

The drill was initiated as a pre-announced event with Citizens Corps members knowing to respond to the EOC at the appointed time.

Performance against Objectives:

1. Exercise packet message passing procedures.

Results: **SATISFACTORY**. Packet operations resulted in 51 messages passed to Simulated County Comm over a 90 minute period. This is almost twice the number of 911 messages (26) passed on a voice on the 911 voice net during the November 2015 exercise.

On average, one packet message was passed to County Comm every 1.7 minutes. No backlog of messages developed, and there were no reports of contention with accessing the BBS.

2. Exercise message passing and message net procedures.
Results: **SATISFACTORY**. The Exercise scenario heavily weighted message traffic to packet with only 25% of the planned messages to be passed over the message net. Message Net Control procedures were in place and handled about 16 messages passed over 2 hours.

This drill also allowed us to test a method for the Radio Room Operator to capture messages directly into an application (Ics213mm v3.2) that would automatically route the message to the DOC for their disposition (see Objective #5 below). This worked well and is worth further exploring as a means for improving message handling.

3. Exercise the amateur radio packet equipment at the SCC Fire Stations located in the City.
Results: **UNSATISFACTORY**. SCC Fire Station communications equipment packs were on line at 2 of the 3 city fire stations. For these 2 stations, Voice operations worked effectively. However, packet operations were not possible due to a missing TNC power connector. This appears to be the result of an incomplete build and must be rectified immediately.

4. Exercise full end to end (Field to Dispatch) emergency packet message delivery.
Results: **UNSATISFACTORY**. CARES was not able to complete arrangements with County Comm to deploy RACES resources to receive and process 911 messages at the County Comm facility in San Jose. As a result, CARES simulated a County Comm packet station to receive and acknowledge 911 packet messages.

Results: **SATISFACTORY**. One of the key elements of this exercise was the receipt of a message from a community member, creating a 911 packet message, and then getting it addressed and sent correctly. From this perspective, it was successful. Messages were correctly addressed to XSCCCC with a copy to CUPCCC. Only one 911 message was received at Cupertino EOC, and this was subsequently forwarded to XSCCCC.

5. Exercise Comm Van to DOC information handoffs.
Results: **SATISFACTORY**. The Van-to-DOC network was brought up and made operational. Telephony service was established between all available VoIP phone locations. Additionally, BETA versions of the programs Ics213mm v3.2 and Outpost v3.2 were deployed to evaluate a more efficient means for handing off information from the Van to the DOC. Requests and replies were processed and exchanged between these two locations. Overall, this was reported to have worked very well.

iv. Chronological Summary of Event / Drill / Exercise
The following is a very high level summary of the main activities that were submitted after the test. All times listed here are in local time.

Time	Description, Notes, Comments
0715	Retrieve the Comm Van, Drive to City Hall.
0730	Comm Van at City Hall.
0805	Field responders at City Hall, start exercise briefing, assignment handouts.
0845	Message Net on CARES TAC-3.
0845	DOC is on line
0854	Arrived at Cali Plaza
0857	Arrived at Main Street
0902	DOC to Van message comm link verified
0903	Arrived at Senior Center
0907	Arrived at Seven Springs Fire
0910	Arrived at Blackberry Farm (est time)
0910	Arrived at Cupertino Fire, reported it was locked; no vehicles present
0910	Arrived at Lawson ARK
0910	Arrived at Post Office (est time)
0910	Arrived at Sears Parking

Time	Description, Notes, Comments
0911	Arrived at City Hall
0914	Arrived at Quinlan (est time)
0923	CCC Logistics dropped off generator at Senior Center
0941	CCC Logistics at BBF, setting up
1050	First Station completed all drill messages
1105	Requested all stations return to EOC for debrief
1139	NCS closed. Started debrief

v. Response at SEMS Levels (as appropriate):
Include a summary, conclusions, the field response, and other local, operational area, regional, state or federal response.

Interaction with Santa Clara County Comm
The 911 NCS operations will ultimately require RACES MACs to deploy and staff an amateur radio system at County Comm. This drill simulated that the 911 NCS was co-located at County Comm. No actual hand-off of 911 messages were made to County Comm dispatch for their action (simulated or otherwise).

vi. Interacting Systems, Agencies, and Programs:
Include mutual aid systems (law enforcement, fire/rescue, medical, etc.); cooperating entities (utilities, American Red Cross, Sheriff's Office, City Departments, etc.); telecommunications and media interactions.

Field Operations Teams
Eleven Field Operations teams were deployed for this drill, each team consisting of at least one CARES member and one ore more CERT members. This partnership allowed us to deploy more field teams with communications capability than if we had to double-up with communicators. The role of each member was a follows:

1. CARES: radio facing; maintained radio contact with the EOC; was control operator for all packet operations; made all required communications log entries as necessary.
2. CERT: community facing. Was the first point of contact with an approaching community member to take their report; engaged the public as necessary. SIMULATED community request scenarios were scripted and the CERT team member evaluated the immediacy of the request and determined the essential elements of the request to be conveyed by formal radio messages to SIMULATED served public safety agencies.

Additionally, both CARES and CERT responders had an opportunity to create packet messages to be sent to the EOC or County Comm.

This pairing of CARES and CERT allowed each individual to bring specific strengths and skills to the assignment. In some cases, in-field conversations were held on clarifying the roles that each performed.

911 Packet Process
One of the key tests of this exercise was to pass all 911 messages to (a SIMULATED) County Comm as a packet message. Unlike the November Comm Outage exercise, this process worked well since the Field Operators were always on the same voice channel as the Cupertino Emergency Net and Packet Operations could be easily shared by both CARES and CERT members.

This 911 NCS process must be fully developed, reviewed, tested and evaluated before final adoption. Not too much of a surprise, the performance against a preliminary list of critical success factors points to plenty of room for improvement. For this drill, the following was concluded:

1. Field Teams can differentiate a 911 request from a general request.
   Results: Inconclusive for this drill; scripted scenarios were presented to the Field Operations teams with guidance as to whether the message should go to the 911 net or on the city's message net.
2. Field Teams can summarize community requests into succinct messages to be passed to County Comm.
   Results: Good. Some training was provided on how to glean the relevant elements of the request and develop an effective message that can result in a successful Public Safety dispatch event. All passed packet messages will be reviewed by County Comm for completeness and usability to support a dispatch event.

3. The 911 packet system received and recorded all incoming 911 requests.
   Results: Very Good. The County Comm packet station was simulated, and polled for incoming messages every 3 minutes. The actual poll time must be agreed to by County RACES to balance timely delivery of critical 911 messages to County Comm with channel utilization.

4. 911 message hand-off of all incoming 911 requests to County Comm for dispatch.
   Results: Out of scope for this drill. This aspect of the process will be tested once the process is defined and validated.

Communications Systems

1. As learned from the November drill, CARES activated the message net on UHF TAC-3, W6TDM Repeater. Contact was maintained with all stations throughout the drill. Coverage and use was reported as satisfactory.

2. The VAN-to-DOC network was activated and worked as planned. The network applications used were the VoIP telephone service, Ics213mm formal message exchange, and local web page hosting. A secure and anonymous file sharing was also available, but not used.

CCC Department Operation Center

The CCC DOC was staffed. The following specifics are noted here:

- The DOC originated and passed messages to the Comm Van for transmission to the Field.
- Interactions with the EOC: received messages were passed by paper hardcopy net and telephone to the DOC.

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vii. Improvements, Conclusions, Recommendations:

As applicable, include a description of actions taken, assignments, associated costs or budget, timetable for completion or correction, and follow-up responsibility.

The following is a summary of the key observations and recommendations.

What worked

- Good W6TDM UHF repeater coverage throughout the City.
- Interactions and teamwork between CARES and CERT field members.
- Terrific Exercise.
- Brought chairs and table, worked well. Also, used the back of an SUV as the work area.
- Personal packet kits worked great!
- Packet messaging was efficient; some receipts took time to get back an acknowledgement.
- Great teamwork!
- Rotated positions so everyone got a chance to work Packet.
- Went smooth, operated on battery.
- Very happy with the DOC message passing; 20 message passed.
- DOC used a large tracking map to record reported conditions, events.
- Ics213mm worked great by the DOC and RRO to directly enter and send messages.

What didn't work / needs improvement

- Difficulty setting up a field site due to lack of familiarity with the system.
- Packet antenna problem when located behind a building. Raised/moved the antenna to resolve the problem.
- Missing TNC power cable at Seven Springs, Cupertino Fire Stations.
- Field team was locked out of one fire station due to all fire crews on assignment.
- It was bright outside; could not see the laptop well.

Recommendations

See Section A: Improvement Plan

viii. Logs, attachments:
As applicable, include a description of actions taken, assignments, associated costs or budget, timetable for completion or correction, and follow-up responsibility.

The following reports are attached:

1. Corrective Action Plan

End of Report.

A. Improvement Plan

This IP has been developed specifically for CARES as a result of 2016 Communications Outage Drill, *Packet Edition* (CUP-16-40T) conducted on 16 May 2016. These recommendations draw on the After Action Debrief. The IP has been formatted to align with the Corrective Action Program System.

Capability	Observation Title	Recommendation	Description	Capability Element	Responsible Agency	POC	Start Date	End Date
1. 911 Message Process	911 Plan	1.2 Refine the Plan	1.2.1. Review drill findings with County Comm.			Jim		
			1.2.2. Review the state of the County Comm amateur radio equipment.		SCC RACES	Logan Z.		
			1.2.3. Define relevant elements of a 911 request and modify form 213 or create a custom field form to list these elements.		County Comm			
		1.3 Training Plan	1.3.1. Develop and deliver 911 message creation training.		CARES	County Comm		
	Packet Ops	1.4 Application Settings	1.4.1. On starting a new packet message, add default text in the message body to include From: xx, To: xx, then the signature line.		CARES	Jim		
			1.4.2. Change procedure: Uncheck send immediate on message completion		CARES	Jim		
		1.5 Equipment	1.5.1. Find and purchase PC equipment / sun shades for field ops		CARES	Logistics		
			1.5.2. investigate field mast kits for packet, voice ops when operating away from the ARKs		CARES	Judy		
			1.5.3. Purchase and build up battery packs for use with packet and other field deployments.		CARES	Logistics		
2. Field Operations	Field Readiness	2.1 Confirm organization readiness for field deployment	2.1.1. Go-Kit Reviews; include Forms, mag mounts	Planning	CARES	Allan, Judy		
		2.2 Message Handling	2.2.1. Develop, deliver training on creating messages from unstructured incoming information.		CARES	Judy		

Capability	Observation Title	Recommendation	Description	Capability Element	Responsible Agency	POC	Start Date	End Date
		2.3 Packet Operations	2.3.1. Plan a field Packet Practice Party.		CARES	Jim		
3. Comm Van Operations	Networking	3.1 Network applications	3.1.1. Define information requirements; buy/build VAN/DOC network apps (Message passing, SitStat tracking, Field Coordination, etc).	Planning	DOC	Gerd, Jim		
		3.2 Application Enhancements	3.2.1. Ics213mm, on Browse, point to the last message first.		Outpost Dev't	Jim		
			3.2.2. Outpost, implement convert packet message to Ics213mm message		Outpost Dev't	Jim		
4. SCCFD Ops	Buildout	4.1 Packet Kits	4.1.1. Resolve missing TNC Power Cable, all SCCFD Packet Stations	Planning	CARES	Jim		
	Buildout	4.2 Monta Vista Station Buildout	4.2.1. Complete station work: antenna cabling, radio programming		SCCFD, CARES	TimM		
		4.3 Volunteer Program	4.3.1 Complete the volunteer program definition. Develop training plan.		SCCFD	Tony		
			4.3.2 Hold SCCFD training. Certify responders.		SCCFD, CARES	Tony		