999—Officer Needs Assistance

800 MHz Radio—A Public Safety Perspective

SUMMARY

*"999!"— **Officer needs urgent assistance. Emergency!***

Since the inception of mobile communications for law enforcement nearly 80 years ago, this has been the most feared and dreaded radio call by police officers.

What if an officer put out a "999" call and no one responded? Could an officer be seriously injured or worse? Could members of the community be in jeopardy or life-threatening danger?

As the implementation of the new 800 MHz Countywide Coordinated Communications System (CCCS, System or the Radio System) in Orange County began in April 2000, stories and newspaper accounts began to circulate concerning the inability of Tustin and Irvine police officers to communicate within certain buildings, parking structures, and numerous other "dead spots" in their cities. Firefighters reported that, on occasion, while inside a burning building it has been necessary to move to a window to communicate with personnel operating the fire equipment outside. These situations place public safety officers, police officers and firefighters alike at risk of serious injury or death.

After an extensive study, the following report has been generated to review the chain of events that led the County of Orange and all participating agencies to the new 800 MHz Radio System. This new System is being implemented in every law enforcement agency, fire department, public works agency and government communications venue in the County. It is a sophisticated and complicated system that manages emergency and non-emergency communications. It is a very costly project that will bring Orange County public safety and public works communications up-to-date.

While this report enumerates the difficulties that are still encountered during each agency implementation, it should be noted that the entire team involved with CCCS is dedicated to resolution of problems. Working with line officers will help to identify and resolve the issues.

The Findings of this report include significant public safety issues and technical concerns such as: antenna sites, reception and equipment problems, and training. The Recommendations in this report address solutions for these concerns, including an independent evaluation for resolution of perceived problems and issues.

PURPOSE/INTRODUCTION

It became apparent to the 2000–2001 Orange County Grand Jury that the implementation of a new 800 MHz digital radio system in our County was a subject for immediate attention. Published reports in the local press were drawing attention to problems in the first two municipalities that began using the new system. Why were police officers going to the press? What problems were they encountering? What is the history of the conversion? How much money has been and will be spent on the conversion? Are there viable solutions that would assure the users and the public of safe, reliable communications during times of ordinary and extraordinary service?

These questions and other issues generated serious concern for the current Grand Jury. The purpose of this study was to examine the process and outcome of updating radio communications in Orange County.

HISTORY/BACKGROUND

The County law enforcement radio system had been in service since 1973. In the mid 1980s, law enforcement and county communications officials realized that the radio system in Orange County had reached its maximum capacity.

Inception and Planning

In 1985 the Orange County Chiefs of Police and Sheriff's Association (OCCOPSA) requested that county communications develop a plan to remedy the situation by obtaining new radio frequencies granted through the Federal Communications Commission (FCC).

Two years later, in 1987, a proposal developed by a joint subcommittee was accepted by OCCOPSA. The subcommittee consisted of members from OCCOPSA and county communications. They formed a team to survey government users of the radio system in Orange County and developed a plan for the future. No independent consultant was utilized for this project.

The County and cities began to set aside funds designated for purchasing a new system. By 1991 a survey of all law enforcement agencies had been conducted and as a result a preliminary Request For Proposal (RFP) was drafted and made available for purchase to contractors. Five companies purchased the RFP but only two, Motorola Inc. and Harris Corp. responded with proposals. A contract

was developed with Motorola and submitted to the Board of Supervisors shortly after the County declared bankruptcy in December 1994.

The original proposal was for approximately $100 million. It included communications for all law enforcement, fire departments, other public safety agencies, and public works. An $82 million proposal was presented after the elimination of two of the proposed tower sites and the reduction of power penetration from 20db (decibel) to 15db. In January 1996 a scaled-down contract was signed for approximately $70 million that included the elimination of Public Works and mobile data terminals for law enforcement. That same year, to oversee implementation of the system, a Governance Committee (a decision-making body) was formed consisting of four city managers and three county representatives with ultimate oversight by the Orange County Board of Supervisors.

Today, wireless communications are commonplace. The competition for radio frequencies has become a critical issue. Orange County was granted a license by the FCC to operate within the 800 MHz frequency band. This band is shared with several wireless communications companies. Neighboring county government agencies have also been granted licenses within the same frequency range. As Orange County and its cities began planning and utilizing the new frequencies, there were many problems to consider.

Planning to Implementation

The original proposal submitted by Motorola was for an analog radio system, but technology in the 1990s had overtaken the market. The County asked Motorola to provide a plan for the newest technology—digital radio.

There were many advantages to the new technology, not the least of which was encrypted communications. Historically, criminals have had access to communications between officers and their dispatch centers. Knowledge of tactics and police activities by the criminal element was something to eliminate.

The 800 MHz band offers an increased number of talk channels allowing field officers to communicate more easily with other officers. The need to communicate among County and city entities is also vital to the County for coordination of mutual aid situations. Mutual aid between fire, police and local government agencies is imperative. The 1993 destructive fire in Laguna Beach highlighted this critical need.

Reliable countywide coverage by the new system was essential. Existing county sites and some private locations have been utilized for transmission equipment. Currently there are 21 antenna sites countywide. There are more antenna sites in the North part of the county than in the South. The County is divided into “cells”, North, South, Northwest, Southwest and Laguna Beach. In the past ten years,

there has been tremendous growth in South County, both commercial and residential. As transmission problems became known, the number of antenna sites has become a costly issue for the new system. The County has a radio transmission coverage expectation based on contract guarantees between the County and the contractor. Recently the County of San Diego implemented an 800 MHz radio system. To reach their system reliability goal, the number of antenna sites increased from 21 on initial survey, to 43 before the system was complete. Additional sites in Orange County may be part of the solution.

Irvine and Tustin, as well as large portions of the southernmost County, have been high growth areas. New areas have opened up to residential and commercial construction in the rural parts of the County. Because of earthquake requirements and other architectural design changes, building structures have more density and/or reflective surfaces that do not allow radio signals to penetrate or pass through. Equipment that can amplify radio penetration is available for these situations (bi-directional amplifiers [BDA]). BDA installations are expensive and not included in the approved contract. This may, however, be a more cost-effective approach to improve reception in these situations.

County Communications supervised the placement of transmission equipment at the antenna sites. The vendor provided a catalog of available equipment for use with the new system. Individual user agencies chose from existing lists of vehicle, handheld, and dispatch apparatus. Custom designs were not available.

In November 1998 an updated contract reinstated the public works component that had been removed in the 1996 contract.

Preparation for the system took until April 2000. County Communications staff conducted some startup testing of the System and field officers received an initial technical training session. Irvine was the first police agency to implement the new System. Problems began to surface immediately. Police officers found that their training was not specifically focused on the use of the new equipment. In addition, they found:

- Dead spots (no reception) and transmission difficulties within underground locations and large dense buildings
- Garbled transmissions
- Difficulty stabilizing the voice volume received from different users. (i.e., loud from a dispatcher and very low from another field officer)
- Excessive power drain of motorcycle batteries
- 10–15 second warm-up activation time for the radio equipment
- Visibility problems with motorcycle console displays—very difficult to read in daylight
- Problems with pushbutton size and configuration on motorcycle units making it difficult to use when wearing gloves

- Location of the red channel selector button (emergency) on the handheld radios causes frequent accidental activation

These are some of the problems encountered. Law enforcement officers expected better support to resolve these problems from the providers of the System. Better pretesting of the System could have identified some of these problems before implementation with law enforcement. In fact, further system implementation was delayed for several months and some of these issues were remedied. Training of subsequent agencies and officers has been modified and improved. There have been adjustments made to the antenna transmission power output and some changes made to mobile and motorcycle equipment. But it is anticipated that additional problems will surface as other cities in the County are switched to the new System.

Implementation into the Future

Future funding and development of new policies and procedures will be a major consideration in the continued operation and maintenance of the 800 MHz CCCS. The System must be funded for on-going maintenance. Currently, there are no agreements among user entities to ensure continued funding of the System. There is a warranty period but modifications or improvements will be necessary and must be funded by participating agencies. There are monthly meetings available to participants from all of the agencies in the County for the exchange and resolution of technical issues (800 MHz Technical Liaison Committee). Problems have been addressed and some resolutions provided.

Although the Governance Committee has served its original purpose well, consideration should be given to creating a Joint Powers Authority (JPA) thus granting legal control over the CCCS. A Joint Powers Authority, pursuant to California Government Code Sections 6500–6528, provides for a legal entity capable of assessing taxes and issuing bonds. A JPA would be able to contract for services or products independently and not depend on the County or any other entity. The JPA would be responsible for maintaining the CCCS after implementation of the currently contracted-for system.

A JPA provides some insulation from extraordinary influences of any one of the participating entities and discourages secession from the group.

METHOD OF STUDY

Interviews were conducted with Sheriff-Coroner’s Communications staff, Motorola staff, Sheriff-Coroner 's personnel and municipal law enforcement officers and their management. Members of the Grand Jury toured radio antenna tower sites by helicopter, visited the communications center at the Loma Ridge facility several times, and attended Governance Committee and 800 MHz Technical Liaison meetings. Interviews were conducted with outside

communications consultants. Grand Jury members rode with on-duty law enforcement officers, reviewed contract documents, and reviewed the San Diego 800 MHz system. In addition, published media reports were used for initial information.

FINDINGS

Under California Penal Code Sections 933 and 933.05, responses are required to all findings. The 2000–2001 Orange County Grand Jury has arrived at the following thirteen findings:

1. For the first time ever, the County of Orange and its 34 cities worked together with a common focus toward a state-of-the-art $100 million countywide communications system for public safety.

2. During implementation of the new 800 MHz Countywide Coordinated Communications System (CCCS), deficiencies existed in the System for the police agencies in the County of Orange, particularly in the cities of Irvine and Tustin. This reduced level of communications performance has put public safety officers and the communities they serve at risk.

3. There have been fewer implementation problems in the north county area of the CCCS than in the south.

4. There has been no recent (5 or more years) countywide survey for 800 MHz radio reception coverage. (The county made no initial survey.)

5. Prior to implementing the CCCS with law enforcement, the system should have been thoroughly tested by agencies in the County not involved with public safety.

6. The reduction of the decibel (db) level penetration from 20db to 15db inside buildings has had a detrimental effect on the overall efficiency of the CCCS.

7. Existing CCCS antenna sites, particularly in the south county area, do not provide adequate, dependable area-wide communications.

8. Commercial wireless communication antenna sites that utilize the 800 MHz radio frequencies within the County create interference with the CCCS and can completely block transmission in the immediate area surrounding these sites.

9. The handheld radios and motorcycle radio head/consoles were not designed specifically for local law enforcement use, nor was local law enforcement consulted for design input prior to initial implementation.

10. The County did not adequately provide initial training and realistic expectations of the CCCS to public safety users.

11. There is no government agency with binding legal authority over the CCCS. Presently, no contractual commitment for future funding of the CCCS exists.

12. Public safety agencies are forced to compete with commercial communications providers (i.e., television, wireless, etc.) for federally assigned frequencies without preference or priority.

13. The close proximity of private and public sector radio frequency assignments within the 800 MHz range is detrimental to public safety.

Responses to Findings 1–13 are required from the Orange County Sheriff-Coroner.

RECOMMENDATIONS

In accordance with California Penal Code Sections 933 and 933.05, each recommendation requires a response from the government entity to which it is addressed. These responses are submitted to the Presiding Judge of the Superior Court. Based upon the findings, the 2000–2001 Orange County Grand Jury recommends that:

1. The CCCS staff should utilize an outside consultant to evaluate the need for corrective action to improve the communications system. (Findings 2–4)

A response to Recommendation 1 is required from the Orange County Sheriff-Coroner and the Board of Supervisors.

2. A countywide survey should be conducted to evaluate the radio coverage area. (Finding 4)

3. Additional CCCS tower sites must be considered to ensure adequate coverage in areas of known deficiency. (Finding 7)

4. The CCCS staff should study the feasibility of developing partnerships with commercial wireless communications providers for the joint use of tower sites and facilities as radio antenna locations. (Finding 8)

5. The CCCS staff should make a recommendation to the equipment manufacturer for the development and/or replacement of motorcycle consoles and handheld radios with user-friendly equipment that does not create a safety problem for the user. (Finding 9)

6. Recurrent and ongoing training of CCCS users should continue to be emphasized. (Finding 10)

Responses to Recommendations 2 thru 6 are required from the Orange County Sheriff-Coroner.

7. The County and cities, along with the CCCS staff, should coordinate future installation of commercial wireless communications antenna sites to mitigate interference with public safety communications. (Finding 13)

8. County and city governments should consider the enactment of ordinances requiring that new commercial construction include bi-directional amplifier (BDA) installations for public safety communications within new structures. Retrofitting of existing commercial structures should be included. (Finding 6)

9. Participating agencies should consider a Joint Powers Authority (JPA) having the legal authority to manage and maintain the CCCS. The JPA would replace the Governance Committee. (Finding 11)

10. Governmental entities and public safety agencies in the County should develop a strategy to elevate public safety communications and frequency acquisition to the highest priority and encourage their respective professional organizations to assist and participate in a national endeavor. (Finding 12 and 13)

Responses to Recommendations 7–10 are requested from the County Executive Office and the Public Facilities and Resources Department.

Responses to Recommendations 7–10 are required from the city councils of cities represented on the CCCS Governance Committee (Costa Mesa, Fullerton, Lake Forest and Tustin), the Orange County Sheriff-Coroner and the Board of Supervisors.

Commendations

The 2000–2001 Orange County Grand Jury commends personnel of the Orange County Sheriff-Coroner Department, the Governance Committee, members of various law enforcement agencies and representatives of Motorola Inc., for their courteous and candid support. Their professionalism, technical expertise and candor proved to be invaluable in the completion of this study. We were particularly energized by the Irvine Police Association.

Appendix

Information Sources

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- Davidson, Paul, *USA Today,* "Cellphones drowning out police radios. Mobile communications explosion interferes with signals—and the results can be deadly" and "Bad things can happen if agencies can't talk, March 12, 2001

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- *Assessment Study of San Diego County—Imperial County Regional Communications System,* July 9, 1999, Deloitte and Touche

- *Orange County Request for Proposal SLL-379650*, revised digital proposal, September 1, 1994

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- City of San Diego, *System Overview of 800 MHz Trunked Radio Network,* February 1995, prepared for Orange County Communications

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- *County of Orange CCCS, Standard Operating Procedures*, March 2000

- *Recommendations for Implementation of a New Orange County Coordinated Law Enforcement Communications System, Communications Committee,* Orange County Chiefs of Police and Sheriff's Association, May 1987

- *Joint Agreement for the Implementation and Operation of the Orange County 800 MHz Countywide Coordinated System,* January 30, 1996

- Comparison of 1990–91 and 2000–01 Assessment Roll Component *"Assessor's Parcels by Property Types"*, January 2001, Orange County Assessor Department

- Previous Grand Jury Report, *Orange County Fire Communications,* 1985 and responses

- Complaints from various police agencies regarding 800 MHz usage

- Various intra- and inter-county communications dating to 1985 regarding radio communications

- Various agencies training outlines and procedures