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Project 25

General Consensus of Panel Discussion:

Move the Project Forward as Quickly as Possible

The general consensus of the Project 25 panel discussion at the APCO Annual Conference was that the project team should attempt to move the entire project forward as quickly as possible so public safety agency telecommunications managers can go on about the business of meeting public safety telecommunications needs in the near future.

Attendees at the Conference had an opportunity to participate in a number of Project 25 meetings and discussions. The Project 25 panel discussion was well-attended and included a cross section of the user and manufacturing communities. The panel members spent more than three hours laying out the basic assumptions they considered when they began making their critical Project 25 decisions.

Moderator Craig M. Jorgensen, co-chair of the project, introduced the panel and gave a brief history of the project, pointing out that it began on the federal side under the auspices of proposed federal standard 1016. On the Association side, it began as a conflict between APCO and the National Association of State Telecommunications Directors (NASTD) and a private group called the Open Architecture Radio for Public Safety (OARPS), founded by Gary Hampton and Dale Hatfield.

OARPS and NASTD wanted standards in the newly allocated 800 MHz spectrum, and APCO did not.

In This Issue:

Contributing Editors in This Issue:

- **Robert M. Gurss, APCO Legal Counsel**
- **Craig M. Jorgensen, Co-Chair, Project 25**

The debate ended in the fall of 1989 in Sparks, Nevada, when all concerned agreed that standards in the "New Technology" environment were necessary to ensure fair competition would exist in the public safety land mobile market. Later that year, the two associations and representative agencies from the federal government met in Washington, D.C., and Project 25 was formed.

At the first organizational meeting, it was decided the project needed to be managed by a Steering Committee comprised primarily of users and user representatives who had insight and knowledge of the needs and problems of the public safety community. This Committee agreed that it would consider only technologies that were presented in a public forum which allowed the full participation of all those who chose to be involved.

The Committee made it very clear that it would select only the technologies that in its opinion met the needs of the users and offered the manufacturing community access to individual Intellectual Property Rights (IPRs) on "fair and reasonable" terms. The process was and is blind to who owns a technology because the Project's objective is to obtain what is best for public safety, and not attempt to control free trade.

Doug Stonebarger of the Department of Defense stressed how important Project 25 is to the defense agencies. He reminded the

attendees how difficult a decision it was for the federal government participants to select technology and standards outside the original proposed federal standards, 1016 (CELP) and 1024.

He went on to provide a detailed description of the critical test platforms the federal government has helped establish to test the proposed Common Air Interface (CAI) data rate, coding and VoCoder hardware implementations. He also described the VoCoder tests that were conducted by the Telecommunications Industry Association (TIA). Those tests were carefully considered in the Committee's selection of the DVSI IMBE VoCoder.

Cost of Conducting VoCoder Test Borne by TIA and its Members

APCO members were told also that the total cost of conducting the VoCoder test was borne by TIA and its members, which include the federal government. Stonebarger then reviewed the proposed Project 25 encryption standards which are based on the federal government's security needs. These standards will no doubt be enhanced as the Steering Committee gives further consideration to recommendations from manufacturers such as GEC Marconi.

Robert Fenichel of the National Communications System (NCS) gave his perspective on the importance of system interoperability within the federal government arena. He reemphasized the need for selecting technologies and standards that provide backward and forward compatibility, as well as horizontal and vertical hardware and software integration.

Fenichel also described in detail the complex federal standards process. He said NCS' primary concern is to provide standards that meet the needs of the government.

Don Speights of the National Telecommunications and Information Administration (NTIA) gave an overview of NTIA plans and policies, emphasizing the need for broad-based technology standards. He pointed out that the Project 25 effort was just one of many standards efforts going on within the federal government. He also made it very clear that the federal agencies have a pressing need to be able to acquire 12.5 kHz radios by 1995 so they can meet NTIA's mandate to start using 12.5 kHz slots by 1995. Speights told the audience he strongly supported the Project 25 effort, while not seeing it inconceivable that NTIA could, and no doubt would, also support other evolving standards in the future.

Proposed Standard Should Embody Maximum Flexibility for Interoperability

APCO Past President Gary David Gray of Orange, California, expressed his desire to ensure the proposed standard embodies maximum flexibility to provide for multi-agency and multi-disciplinary interoperability. He said the interdependence of cities, counties, police, fire, medical and other public safety services can be seen in government systems throughout the nation. Gray reminded the attendees that the need for interoperability permeates the fiber of public safety daily activities. Therefore, it is critical that we have a clear migration path providing both forward and backward compatibility. This will ensure agencies can acquire hardware on a piecemeal basis, without jeopardizing their organizational or operational efficiencies or interdependencies.

Glen Nash of the State of California General Administrative Services gave an overview to the conference attendees of the NASTD perspective of the Project 25 standards process.

He said it was critical that the project adopt technology that could be used in both a large- and small-system environment. He pointed out that California, which has an economy and land mass larger than many countries of the world, uses both large and small systems to accommodate the needs of its users. In fact, the state is a patchwork of small systems tied into one network.

Nash said states have a need to acquire technology that allows large and small state users the ability to take advantage of a graceful migration path, have full interoperability, and to fully utilize the spectrum allocation now available on an ubiquitous basis. These systems need to be able to take advantage of multi-site transmitter and receiver technology that provides both simulcast and satellite receiver functionality.

He believes the proposed Project 25 standards will provide that ability.

Canadian Government Thought to Be In Conceptual Support of Proposals

Paul Derynck of Alberta, Canada, then expressed APCO Canada's support of the Project 25 standards process. Although he spoke only for APCO Canada, he said he thinks the Canadian government is in conceptual support of the existing proposals. While APCO Canada supports the existing processes and proposed standards, it would like to see the standards include stronger transmitter and receiver specifications.

In APCO Canada's opinion, the transmitter and receiver specifications discussed to date are written for base-line equipment that would not serve most of the needs of Canadian public safety agencies. However, since the transmitter and receiver standards specifications review is some weeks away, Derynck encouraged fellow APCO members to join him on a Project 25 Transmitter and Receiver Specification Task Force to review those issues.

Memorandum of Understanding Offers Unique Opportunity for Industry, Consumers

APCO Legal Counsel Robert Gurss provided an overview of the Memorandum of Understanding (MOU) and the Intellectual Property Rights (IPR) agreements. In his opinion, the MOU between the Steering Committee and TIA represents the foundation of the formal working standards relationship and offers a unique opportunity for industry and its consumers to work together for a common good.

The MOU among manufacturing companies defines their relationship to each other and requires each company to license its technology to others on "fair and reasonable" terms. The IPR defines terms and the conditions by which technology assets will be exchanged, used or otherwise exploited.

These documents represent the core of the Project 25 working relationship with the TIA members.

However, Gurss cautioned the audience to avoid misunderstanding APCO's role and, in turn, the Project 25 Steering Committee's role in resolving IPR and MOU disagreements. Those are issues and problems that are clearly outside the scope and intention of the Steering Committee. In addition, the Steering Committee has no legal or moral obligation to become involved in disagreements that may occur among manufacturers.

Art McDole of the Northern California Chapter of APCO reviewed some of the issues that were considered in the Steering Committee's deliberations over adopting a proposed standard for QPSK-C modulation. Although none of the manufacturers origi-

nally proposed QPSK-C, it became a non-proposal when the Steering Committee began to insist on forward and backward compatibility. Motorola and E.F. Johnson originally wanted 4-PSK and Ericsson GE, and later GEC Marconi, wanted pi/4 DQPSK. Bendix-King and others were uncommitted.

McDole chaired a task force that voted unanimously for QPSK-C even though the Adjacent Channel Interference Protection Rate (ACIPR) was 2 dB less than some of the other proposals under consideration. His task force felt the advantages offered by the technological flexibility of this modulation scheme far outweighed the slight difference in protection.

The task group carefully considered all options and felt this approach would allow the best opportunity to provide public safety users a stable migration path through forward and backward compatibility.

Large, Small Users Should Be Able To Phase In Digital Despite Budget Limits

This ensures both the large and small users can phase out their old analog radios and begin to replace them with new digital radios and still remain within their current severe budget limitations. McDole said this decision was clearly supported by tests conducted at Motorola's test lab in the presence of those TIA members who chose to participate.

Those tests showed that QPSK-C receiver will receive FM, analog, 12.5 kHz and 6.25 pi/4 DQPSK without modification. Finally, he reminded the group that the modulation decision was unanimously supported by the Modulation Task Group, supported by the majority of the "New Technology" Task Group, where the vote was 14 in favor, two opposed and two abstained.

In light of that overwhelming support, the Steering Committee unanimously adopted QPSK-C in its March 1992 Steering Committee meeting.

APCO President John Powell then discussed APCO's perspective of the proposed Project 25 standards and the importance of interoperability to those standards. He cited the Oakland, California, hills fire and the San Francisco earthquake as just two examples he has faced recently that required a high level of interoperability.

FDMA to Provide Greatest Improvement In Spectrum Use Within Current Allocations

In his presentation, he emphasized that based on an APCO frequency coordination office study of existing FCC licenses, he is more convinced than ever that the FDMA solution will provide the greatest improvement in spectrum utilization within our existing allocations, while concurrently providing the highest level of interoperability.

Powell went on to say that between 40 and 80 percent of the public safety users are now using only a single frequency. The earlier proposal to adopt TDMA would have required these users to use both slots of the 25 kHz channel, even though they need only one, thereby increasing the amount of spectrum being wasted instead of reducing it.

In fact, he said that about 59,000 public safety licensees in the United States do not meet today's minimum channel-loading requirements of 70 mobiles to qualify them for a second frequency, and 48,000 of the 59,000 licensees have fewer than 25 mobiles.

He also questioned if the real-world problems of simulcast and satellite receivers could be easily adapted in the TDMA environment within the time frames required to meet existing and projected demands.

Powell also expressed his appreciation to Ralph Haller, Chief of the FCC Private Radio Bureau, for his words of encouragement about the Project 25 process and proposed standards and masking tables. Finally, he indicated that the Project 25 standard was intended as a base-line standard and that users should decide on technology and equipment that best fits their needs for features, technology and, of course, interoperability and price performance.

Dr. Gregory Stone, representing the Immigration and Naturalization Service, told the audience how the federal user agencies strongly support the Project 25 process and proposed standards, even though there are still a few backward compatibility issues he strongly believes the Steering Committee must work out.

Ray Ginman of the United Kingdom also offered his continued support of Project 25. He indicated that when the time came for the United Kingdom to make its decision on maximum spectrum efficiency vs. what is best for the officers on the street, there is no doubt in his mind he will come down hard on ensuring that the officers in the field have the technology they need.

Don Pfohl of the Arizona Chapter of APCO expressed concern that the process is taking too long, and he wants to make sure the Project is providing a level playing field which will meet the end objective.

He indicated the Arizona Chapter has met on several occasions to discuss this issue because they have a lot of users with older systems that need replacement in a timely manner. He concluded that they would like to see this process completed so the committee can move on to other issues.

Mike Borrego of the Colorado Chapter of APCO admonished the Steering Committee to move for conclusion of the 12.5 kHz standards as quickly as possible so public safety agencies across the nation can begin the long, drawn-out process of replacing systems and hardware.

Primary Objective to Obtain 400% Increase In Spectrum Is "Seriously Questioned"

Carl Noack of Manatee County, Florida, said he seriously questioned if the Committee could meet its primary objective to obtain a 400 percent increase in spectrum. In his opinion, the current technology would improve spectrum utilization by only 17 percent instead of the primary objective of 200 to 400 percent.

He further said that if APCO published Common Air Interface standards, it would lead to agencies' purchasing technology that didn't meet their operational or technological needs. The Steering Committee members agree improvement in spectrum utilization is one of its objectives, but certainly not the primary objective.

Moderator Jorgensen also pointed out that arriving at any figure of merit for spectrum improvement is more of a theoretical exercise than a practical one because the results obtained are predicated on the assumption used for the base. He noted that the Steering Committee has seen reports on spectrum improvement that now range from 17 percent to around 140 percent.

In reality, the improvement gained will be based on what is there now, who is using it, how are they using it and the coverage and adjacent-channel and user problems faced.

He said, "If we were dealing with fallow spectrum with no current users and a defined need for multiple channels assigned to the same user in the same coverage area, further spectrum utilization improvements would no doubt be possible."

Jorgensen said he believes "public safety telecommunications managers would be remiss in their responsibilities if they took the Project 25 standards, in isolation of their own defined user and technology requirements, and used them as their complete equipment specifications."

The Project 25 proposed standards are intended as base-line standards, and cannot and should not be written to embody every user's actual or potential needs. Therefore, the user will always find exceptions to the rule. Agencies that must buy non-standard or other standard equipment to meet their own very specific needs can and will do so, he said.

The Project 25 Steering Committee has no interest, he said, in attempting to replace an agency manager's knowledge and experience with the Project 25 standard. ■

Congress Requires FCC to Study, Respond to Current and Future Spectrum Needs

The entire nation watched this past August as Congress passed President Clinton's budget bill by the narrowest of margins. What few outside of the communications industry noticed, however, was that hidden among all the tax and spending provisions was some of the most important radio spectrum legislation ever adopted by Congress, including provisions that will have a dramatic long-term benefit for public safety communications.

Title VI of the Omnibus Budget Reconciliation Act of 1993 incorporates legislation to require the federal government to release up to 200 megahertz of federal radio spectrum for non-federal uses. This found its way into the Budget Act because the bill also authorizes the FCC to assign radio frequencies through auctions, the revenue from which will go into the U.S. Treasury.

Fortunately, the legislation includes key language (recommended by APCO) intended to ensure that state and local government public safety spectrum needs will be protected. For example, the FCC and NTIA are required to meet, "at least biannually, to conduct joint spectrum planning with respect to ... the future spectrum requirements for public and private uses, including state and local government public safety agencies." The FCC must also develop a plan for allocating the released spectrum and such plan "shall ... contain appropriate provisions to ensure ... the safety of life and property ..."

Radio frequencies allocated to public safety (and to other "non-subscriber" services) are exempt from auctions. Moreover, the Commission is prohibited from allocating spectrum to particular services based upon "the expectation of federal revenues."

Nor may auctions "alter spectrum allocation criteria and procedures established by other provisions" of the Communications Act, including the requirement that priority be given to the safety of life and property.

Most importantly, the Commission's authority to issue licenses through auctions will cease to be effective if "the Commission has failed to complete and submit to Congress, not later than 18 months after the date of enactment of this subsection (i.e., when the President signed the bill), a study of current and future spectrum needs of state and local government public safety agencies through the year 2010, and a specific plan to ensure that adequate frequencies are made available to public safety licensees."

The congressionally mandated study provides APCO and others in public safety both an opportunity, and an obligation, to demonstrate the extent of current spectrum shortages and future needs. APCO cannot allow the Commission to pursue the study and develop a "specific plan" on its own. There must be direct input from public safety users, which will require a significant commitment of time and resources by APCO and its members. A final section of the bill imposes new annual "regulatory fees" on licensees other than governmental and non-profit entities, and amateur radio operators (except for a nominal $7 fee for "vanity" amateur call signs).

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The FCC has modified its public safety exemption from mandatory relocation out of the 2 GHz microwave bands. A separate article in this issue of the APCO Bulletin (on the next page) discusses the FCC's action, and provides guidance for state and local government microwave licensees contemplating negotiated relocation to alternative frequencies. ■

For further information, contact Robert M. Gurss at (202) 457-7329.

A Guide for 2 GHz Microwave Licensees

Many licensees of 2 GHz fixed microwave facilities are likely to be approached in upcoming months by new personal communications service (PCS) providers seeking to pay for the relocation of their microwave operations to alternative frequency bands. FCC guidelines will allow most public safety microwave licensees to say "no" and remain on the 2 GHz band indefinitely.

Nevertheless, all 2 GHz microwave licensees should consider the advantages or disadvantages of a voluntary negotiated relocation in their particular circumstances. For some users, this process may provide an opportunity to replace outmoded microwave equipment with state-of-the-art facilities at little or no cost. Indeed, pursuant to the FCC's latest ruling, some state and local government licensees will be subject to mandatory negotiated relocation.

The following is an overview of the Commission's rulings in this area, the negotiating process and some recommended strategies.

The FCC's Actions

A year ago, in October 1992, the Commission reallocated the 2 GHz band for "new emerging technologies" that include, but are not limited to, Personal Communications Services (PCS). The band had been allocated for private operational fixed microwave facilities. Many of the current licensees on the band are state and local governments using microwave to provide the backbone for their wide-area mobile radio systems. Other microwave licensees in the 2 GHz band include utilities, railroads and petroleum companies.

As a result of efforts by APCO and other public safety groups, the Commission's October 1992 ruling indicated that state and local government licensees would be allowed to stay on the 2 GHz band indefinitely, though they were encouraged to negotiate with PCS providers to move to other frequency bands. Other microwave users (utilities, railroads, etc.) were made subject to a

mandatory negotiation process, and, if negotiations fail, to FCC-forced relocation. However, the FCC said that it will not require relocation unless the new service provider finds alternative frequencies for the microwave licensee and pays all costs related to the construction of comparable facilities using the new frequencies.

More recently, in August of this year, the Commission narrowed the exemption from mandatory relocation (which had applied to all state and local governments), limiting it to public safety facilities on which a "majority of communications" is for "operations that protect the safety of life and property." The apparent intent was to exclude systems used by municipal utilities and other non-emergency government agencies. However, the Commission did not define what services would meet the "safety of life and property's" test, and does not intend to do so except on a case-by-case basis.

The Commission also imposed an arbitrary distinction between various government microwave systems, though the practical impact of the distinction is unclear. Microwave systems licensed based upon eligibility in the Part 90 Police, Fire, EMS and Special Emergency Services are now exempt from mandatory relocation only if a majority of their facilities are used for operations that protect the safety of life and property.

Microwave systems licensed based on eligibility in other Part 90, Subpart B, services (Local Government, Forestry-Conservation and Highway Maintenance) do not automatically qualify for the exemption. Rather, they must demonstrate that a majority of communication on their facilities are for operations that protect the safety of life and property.

This distinction among Part 90, Subpart B, Public Safety services, while perhaps elevating form over substance, is unprecedented and fails to recognize the true public safety nature of forestry-conservation, highway maintenance and other local government operations. As a result, some local government microwave systems, especially those heavily used by agencies not obviously involved with protecting the safety of life and property, may be forced to relocate.

APCO will be working with other public safety groups to seek FCC reconsideration of this latest ruling. Fortunately, even the latest FCC action guarantees that no microwave licensee will be required to move out of the 2 GHz band unless the new service provider finds alternative frequencies and pays all costs related to the move.

The Mandatory Negotiation Process for Non-Exempt Licensees

Microwave users that do not qualify for the public safety exemption (which, as noted above, may include some state and local government systems) are subject to a two-year voluntary negotiation period, commencing when the FCC accepts applications for new emerging technology services in the 2 GHz band (the first PCS applications are likely to be accepted within the next six months).

Microwave licensees are encouraged to reach relocation agreements with new providers during that time period.

At the expiration of the two-year period, and if no agreement is reached, the new service provider may initiate a one-year mandatory negotiation period in which the parties are expected to negotiate in "good faith." The Commission also has encouraged parties to use mediation and arbitration procedures if negotiations fail.

After the one-year mandatory negotiation period expires, and if an agreement is still not reached, the new service provider may petition the FCC to force relocation. However, the Commission will impose mandatory relocation only if the new service provider demonstrates that alternative frequencies are available and is willing to pay all costs related to construction of facilities "equal to or superior to" the microwave licensee's existing facilities.

Special Rules for Bands Allocated for Unlicensed Devices

There are special rules for frequencies allocated for unlicensed devices, such as the 1910-1930 MHz band which has been proposed for unlicensed PCS (e.g., wireless LANs and PBXs). A provider of unlicensed services may initiate a mandatory one-year negotiation process at any time (there is no voluntary two-year negotiation period). If negotiations fail, the new service provider may petition the FCC to force relocation, subject, of course, to the new service provider agreeing to pay all expenses related to the relocation.

An unlicensed service provider cannot force an exempt public safety licensee to move out of the 2 GHz bands. However, even an exempt public safety microwave licensee can be forced by an unlicensed service provider to move to other 2 GHz frequencies (e.g., outside of 1910-1930 MHz). Of course, the unlicensed service provider must assume all costs of the move (which should be far less than a move to a higher frequency band).

Recommendations for State and Local Government 2 GHz Licensees

First, state and local government microwave licensees should evaluate their situation, and determine whether they can claim an exemption from mandatory relocation negotiations. The exemption is intended to be self-executing. In other words, a public safety licensee that believes it is exempt from relocation under the FCC's criteria simply asserts the exemption when approached by a new service provider seeking to initiate negotiations. The FCC will enter the picture only if the PCS provider challenges the exemption and seeks a ruling from the Commission.

Second, all microwave licensees, even those that are exempt, should explore the possible benefits of a negotiated move out of 2 GHz. There is likely to be considerable demand for 2 GHz frequencies, at least in and around major metropolitan areas with little or no vacant 2 GHz spectrum. Initially, the demand will be in the 1850-1990 MHz frequencies set aside for PCS.

Some microwave licensees will be well-situated to negotiate very favorable terms with PCS providers regarding the quality of replacement of facilities and, in a few cases, may even be able to negotiate creative agreements that include payments and/or other benefits that go beyond the cost of building a new facility. Others, especially those in rural and other areas with abundant 2 GHz spectrum, will be in a less-favorable bargaining position. Still others may be in a position to impose stiff demands, but are exempt from mandatory relocation and have relatively new microwave facilities and/or would prefer to avoid the disruption of a relocation.

Every relocation agreement will be different, based on the relative circumstances of the microwave licensee and new service provider. However, there are certain minimum provisions that should be in every agreement. These provisions, which are set forth below, are essentially the requirements that the FCC itself will impose on a new service provider before approving a forced relocation. The FCC will require that the new provider:

1) Guarantee payment of all costs of relocation to a compa-

rable facility. In determining comparability, the Commission will consider system reliability, capability, speed, bandwidth, throughput, overall efficiency, bands authorized for such services and interference protection. Relocation costs include all engineering, equipment and site costs and FCC fees, as well as any reasonable additional costs.

2) Complete all activities necessary for placing the new facilities into operation, including engineering and frequency coordination.

3) Build and test the new microwave system.

These constitute the minimum requirements for any relocation agreement. Other more stringent requirements should be added to negotiated agreements where feasible.

Finally, relocation negotiations should be entered into with great care, and where possible, with support from engineering consultants and attorneys familiar with microwave relocation issues. Keep in mind that relocation agreements can, and should, provide that the costs for such professional services be covered by the new service provider as reasonable costs related to the relocation. ■

Silent Key ... Roanne Rubin Tall

Roanne Rubin Tall, the 9-1-1 Coordinator for Seminole County, Florida, who chaired several APCO committees and assisted with establishing the APCO Institute, died September 1 in Fish Memorial Hospital, New Smyrna Beach, Florida. She was the wife of retired APCO Executive Director Robert E. Tall, founding editor of the APCO Reports and an APCO Life Member.

In a message to APCO members, Bob Tall wrote:

I want you all to know the deep sorrow that came on me with the death of my wife, Roanne Rubin Tall, on September 1, 1993, was lessened at least in part by the outpouring of sympathy from APCO members and Chapters everywhere, expressed in various ways as you became aware of Roanne's passing.

As many of you know, ours was an APCO marriage, following years of participation in the organization by both of us, although we really didn't come together until the 1984 Annual Conference in Cincinnati.

My retirement from APCO last year and my work in other areas did not dim in any respect Roanne's enthusiasm for or dedication to the work of the APCO Institute. She gave liberally of her talent and advice as we first established the Institute, and she contributed as much of herself to it as she could, at personal, Chapter and International levels, particularly to enhance 9-1-1 services.

There are those who are asking what they can do to remember Roanne. I can think of nothing that would please her more than monetary contributions -- in any affordable amounts -- to the Institute, earmarked for 9-1-1 training and educational activities.

I hope I will have the opportunity to see each of you again in the future. God keep you all. ■

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