

APCO REPORTS



ASSOCIATED PUBLIC-SAFETY COMMUNICATIONS OFFICERS, INC.

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APCO Project 25 - new technology standards project ... setting the issues straight

The Steering Committee believes this open letter is necessary to answer a number of questions and allegations being raised by APCO members and public safety users as the result of an advertising campaign by Ericsson GE. EGE is unhappy with a nearly three-year-old decision by Project 25 to select FDMA instead of TDMA for channel access.

We hope this letter will help settle this matter as a follow-on to the "Project 25 Q&A" published last month. We want to stress that EGE has supported Project 25 from the beginning. EGE personnel have been valuable participants in Project 25 activities. There is simply disagreement between EGE and Project 25 on this major issue.

In the mid-1980s, there was a call to establish trunking standards for 800 MHz analog trunked systems (you may remember Over the Air Radio for Public Safety - OARPS). EGE was a major proponent of OARPS. After close examination by APCO and by the FCC, agreement was reached that the large embedded equipment base made it impossible to establish such a standard.

However, there was also agreement that when digital radios came to the forefront, such a standard would be mandatory. In 1988, the FCC issued Docket 88-441 on Advanced Technology for the Public Safety Radio Services. Project 25 began in October 1989 as a direct result of that Notice.

Project 25 is the first-ever standard-setting effort involving public safety agencies at the local, state and federal level. Its activities are governed by a Steering Committee composed of representatives from each branch of government. APCO represents communications at the local level, the National Association of State Telecommunications Directors (NASTD) represents state government, and the federal government is represented by members of the Department of Defense (DoD), National Communications System (NCS), and the National

Telecommunications and Information Administration (NTIA).

Project 25 has developed a Memorandum of Understanding (MOU) with the Telecommunications Industry Association, the major trade association for land mobile radio and a telecommunications standards-setting arm of the American National Standards Institute (ANSI). Through this MOU, an industry advisory group, TIA-25, has assumed a key role in Project 25.

At the Boston Annual Conference in August 1990, the Project 25 Steering Committee, along with a group of manufacturers including EGE, began debate on the access method to be used for Project 25. There were three contenders (CDMA: Code Division Multiple Access, FDMA: Frequency Division Multiple Access, and TDMA: Time Division Multiple Access). After reviewing the alternatives, the Advanced Technology Subcommittee voted to select FDMA for Project 25. This recommendation was adopted by a unanimous vote of the Project 25 Steering Committee in October 1990.

All equipment technical standards proposed for Project 25 have been carefully evaluated and, in most cases, field-tested. They have been subjected to review and comment by the entire TIA-25 committee in open meetings. Project 25's FDMA proposal has undergone this scrutiny. The one TDMA proposal presented by EGE was marked proprietary and was given exclusively to the Steering Committee with no mechanism for TIA-25 review or comment.

We want to make it clear that we are not trying to lock out any potential technologies. In fact, as we study very narrow-band designs (less than 12.5 kHz) and technologies of equivalent spectral efficiency, it is probable that TDMA could prove to be a viable contender. However, the issue of very narrow-band (or equivalent spectral efficiency) technologies has yet to be addressed by Project 25.

We have invited Ericsson GE to actively participate in, if not lead, the TIA task group that will shortly form to discuss standards for Project 25's very narrowband (or equivalent spectral efficiency) technologies.

In the opinion of the Steering Committee, the reasons for the FDMA decision are as valid today as they were at the time the vote was taken. They include:

Equipment Availability Time-Frame

FDMA provides an immediate migration to 12.5 kHz channels, resulting in a near doubling of available channels to all users in most bands as equipment is changed. The 12.5 kHz channel plan is soon to be a federal government standard and appears to be the maximum single channel width that will be authorized by the FCC as a result of Refarming Docket 92-235 for all bands below 800 MHz.

12.5 kHz equipment is now being delivered, both in the United States and in Europe. Such equipment using the digital modulation proposed for Project 25 is now being delivered in the United States by at least one equipment manufacturer, while others are reported to be in the development cycle. When TDMA was proposed in late 1990, we were told by EGE that it was "about two years away" from delivery. When we met with EGE at Phoenix on March 20, 1993, we were told this equipment is "about two years away." There appears to have been little progress in the interim 30 months! Public safety can not wait two (or more) years longer.

12.5 kHz FDMA equipment uses off-the-shelf components designed specifically for the private land mobile radio service. It does not use modified cellular telephone equipment nor does it use two different modulations as proposed by EGE, one for the field unit and a different one for the base unit, presumably because current portable/mobile linear amplifiers do not have sufficient power for public safety applications. Finally, you should know that the proposed Project 25 Standard is receiving worldwide consideration and review.

Interoperability and 'Talk-Around'

Public safety relies heavily on portable-to-portable or mobile-to-mobile intercommunications without the use of a repeater in tactical situations, including mutual aid. TDMA does not easily support a "talk-around" mode due to the requirement for a common controller to synchronize time slots. This is a critical issue. In fact, it is so critical for mutual aid interoperability that APCO will, once an interim standard is adopted, petition the FCC to require that the Project 25 standard mode of operation be required to be supported, in addition to any other modes, in all digital radios type accepted by the FCC for the Public Safety Radio Services. This is Project 25's

baseline standard and lowest common denominator -- without it there is no interoperability!

EGE is proposing to revert to a full 12.5 kHz FDMA-type system when in talk-around mode. This mode of operation will potentially have significant impact on wide-area system which, by design, may not provide good local area coverage (building penetration, for example). In such systems, agencies are now using command vehicle-mounted base/repeater stations to improve coverage. When an incident (hostage situation or fire, for example) occurs, the agency shuts down one channel on its wide-area system and reassigns it to that incident for local tactical use. With a TDMA system, all time slots assigned to that channel will be shut down, impacting several talk paths. With an FDMA system, only a single path is affected.

Channel & Equipment Requirements

Ericsson GE is arguing that an agency requires contiguous channels to implement FDMA. EGE has distributed diagrams showing two 12.5 kHz FDMA signals on the centers of contiguous 25 kHz channels, with a new 12.5 kHz signal in the middle to demonstrate this concept. However, this demonstrates an isolated situation. In reality, spectrum relief will come from FDMA in the same manner as it has in the past when channel widths have been narrowed. It will come as the result of many (eventually all) users moving to 12.5 kHz equipment, allowing all licensees to benefit from rechanneling of an entire band, without regard to where they are in the band. Likewise, it is being argued that the interleaving of non-public safety services between public safety channels will prevent the implementation of FDMA.

Again, EGE has distributed diagrams showing public safety channels interleaved with other commercial users. In fact, this interleaving exists in only one public safety band, the original 800 MHz allocation of 70 channel pairs. Even in this block there are some exclusive subgroups.

Where we see the most immediate benefit from Project 25 equipment is (1) the 800 MHz NPSPAC band with more than 230 channel pairs, and (2) the 150-170 MHz VHF band. In both cases, these are blocks of adjacent channels assigned exclusively to the Public Safety Radio Services.

The NPSPAC channels are on 12.5 kHz channel centers and have now been allocated across the United States based on loading standards established by Regional Planning Committees. Due to the 25 kHz bandwidth of equipment available when the NPSPAC band was first authorized, it was necessary to use geographic separation to implement systems on 12.5 kHz channel centers.

Even with the reduced modulation required in the NPSPAC band and optional tighter receivers, many agencies are concerned that they will be subject to intolerable interference. Use of true 12.5 kHz equipment alleviates this interference problem

and will allow systems to be packed tighter together by the Planning Committees.

It is conservatively estimated that over \$200 million in 800 MHz NPSPAC bids are now "on the street" asking for Project 25 compliance for these immediate benefits. This same situation exists at VHF where 25/30 kHz equipment is in use on 15 kHz channels. Availability of 12.5 kHz equipment will immediately eliminate the need for geographic spacing as new systems are implemented.

Large vs. Small Systems

Arguments being presented for TDMA are based on large systems where we do not argue that there appears to be benefits for TDMA, as long as there is no need for interoperability with non-TDMA systems. But public safety predominantly consists of small individual entities. As of June 1, there were 58,187 Part 90 licenses issued in the Public Safety Radio Services below 800 MHz (excluding the Special Emergency Radio Service) which had only a base station(s) and fewer than 70 mobile/portable units. Of these, there were 47,691 which had 25 or fewer mobile/portable units.

In reviewing the Refarming comments filed by APCO and many other public safety users, it is clear that public safety users want loading requirements and strict coverage restrictions placed on all public safety licensees. In reality small agencies will not be able to justify more than one FDMA channel or TDMA time slot.

The major drawback to TDMA is that, unless an agency can justify and make use of all time slots within a single channel or allow another jurisdiction needing virtually identical coverage to share their system, spectrum is wasted. With FDMA, the agency uses only that spectrum which can be justified. For example, if a small agency with 25 mobile units installs a 12.5 kHz TDMA system but can use only one time slot, the efficiency is 25 units per 12.5 kHz. Should the same agency install a future 6.25 kHz FDMA system, the efficiency is 25 units per 6.25 kHz.

Migration

To implement any new technology, an agency will have to change out all equipment unless that new technology also supports a backward compatibility to today's FM systems. This is a requirement of Project 25's proposed multi-mode standard, and one that will not necessarily be there unless mandated as part of a standard. Furthermore, we do not know what tomorrow will bring, especially in light of Refarming. Project 25 has attempted to define a migration strategy that not only has backward compatibility to today's

FM systems, but also forward compatibility between receivers in the first and second generation of future radios.

With receiver compatibility, migration to second generation and beyond is graceful. With no migration path, a complete system changeout is required with each new generation of equipment.

The Need for Spectrally Efficient Technologies

Vehicular repeaters and combined high-speed data/voice systems are two types of systems that would appear to be suited for TDMA technology in the future. However, realizing that there are many solutions to spectrum efficiency, we invite all manufacturers and users to actively participate in the second phase of Project 25 as we examine very narrowband and other systems which offer equivalent spectral efficiencies. But, unless we first have an interoperability standard, the part of Project 25 which is now being completed, users will be as isolated as they currently are by the lack of compatible Project 16 trunked systems and public safety encryption.

Again, today's proposed interim standard is Project 25's lowest common denominator and the best first step to the future.

Unknown Health Risks

The physiological concerns related to RF energy have not been resolved. The pulsed radiation of TDMA significantly increase this concern. The news media has made all of us aware that there have been legal actions initiated as a result of these unknown and unproven effects, and until we can be assured that this issue is resolved, we cannot in good faith recommend a standard which may result in health risks or agencies incurring potential liability exposure.

The Bottom Line

The decision to adopt FDMA was made by a select representative committee composed of federal, state and local public safety users, working in concert with the land mobile radio industry. The economic impact on users was certainly a major consideration in evaluating and selecting alternative technologies.

While the resultant effect on any particular manufacturer was carefully avoided in the decision making process, the Steering Committee did carefully review terms for cross licensing of intellectual property between manufacturers to ensure that they were fair and equitable.

In spite of our original vote for FDMA, Ericsson GE apparently has made a corporate decision to not support the TIA Groups recommendations and our consensus of those recommendations. The Project 25 Steering Committee accepts and supports the right to disagree. However, we are concerned that addressing concerns in advertisements instead of the formal TIA process tends to convolute the issue and polarize the participants without any real benefit to the agencies we all are committed to serve.

Accordingly, we would ask all the Project 25 participants to lower the volume of advertising and strictly adhere to the facts. You, the consumer, should evaluate all the conflicting statements and make your own judgment, based on the facts that have been formally presented and the actions that have been formally taken.

The Steering Committee is not concerned with promoting technology; we're interested in doing the best job possible to set a direction that protects and improves your future technology investment.

The Project 25 Steering Committee is composed of knowledgeable and respected public safety communications leaders, with the vast majority of the land mobile radio industry standing behind its decisions. If the Project 25 Steering Committee's decisions were wrong, more manufacturers would be raising a red flag in the formal TIA/P25 Process.

Signed: **Craig Jorgensen, Co-Chairman**

John Powell, Co-Chairman

International affiliates and Executive Council makeup are the two resolutions facing the 1993 Annual Quorum in New Orleans

Two resolutions will be on the agenda for the 1993 Annual Conference quorum in New Orleans. One spells out the way international affiliates can be chartered. The other changes the wording about the makeup of the Executive Council concerning its two APCO Past President members. It adds the word "eligible" to say the Council includes the "two most recent eligible" Past Presidents. The date and time of the general business session at which the resolutions will be voted on will be listed in the Conference Program Pocket Guide. The guide will be distributed to Conference attendees in their registration packets in New Orleans.

RESOLUTION NO. 1

INTENT: To amend the APCO Constitution and Bylaws.

PURPOSE: To provide the opportunity for International Affiliates within the APCO organization.

MAKER: The APCO, Inc. Board of Officers.

TO: The 1993 Annual Conference Quorum.

WHEREAS: There is great interest by a number of persons residing in other countries in creation of affiliated organizations of APCO in their nations, and

WHEREAS: The Executive Council has directed the Board of Officers to develop an affiliation agreement with the United Kingdom, and

WHEREAS: There may or may not be legal or political prohibitions for international chapters as opposed to affiliate status, and

WHEREAS: It is the desire of the collective membership of APCO to share the opportunities of membership in this Association with our peers throughout the world; now, therefore, be it

RESOLVED: The Constitution and Bylaws of APCO, Inc. be amended as follows:

I. Constitution Article I, Section 1. Name: shall be changed to read as follows:

This organization shall be known as the Association of Public-Safety Communications Officials-International, Inc. (APCO-International, Inc. or simply APCO) and referred to in this document as "the Association."

II. Throughout the Constitution and Bylaws of the Association, the title of the Association shall be adjusted to appropriately reflect the name modification.

III. Constitution Article II, Section 1. Organization: shall be amended to read as follows:

Section 1. Organization:

The Association is a non-profit corporation formed under the laws of the United States and the State of Indiana and operating the Association headquarters office under the laws of the State of Florida. It is an individual member association unless noted otherwise, but its members may be grouped into Chartered Groups. Chartered Groups are International Affiliates, Chapters or Councils as provided for in the Constitution and Bylaws, Policy Manual or contract. Members of Chartered Groups are bound to abide by the Constitution and Bylaws of the Association, its manuals and contracts, but are otherwise autonomous and separately responsible organizations. The Association may form up to four U.S. regions consisting of chapters grouped in a geographical area. Each International Affiliate shall constitute a region.

IV. Constitution Article II, Section 3.

Voting and Elected Officers: shall be amended to read as follows:

Section 3. Voting and Elected Officers:

The right to vote and hold elected office in the Association and in its chapters is a privilege of the voting class of membership only, except as may be specified in this document.

Constitution Article III, Section 2.

Chartered Groups/Chapters:

Change Section 2 to read:

Chartered Group

Change Section 2.1 to read as follows:

2.1 Chartered groups are International Affiliates, Chapters or Councils of the Association. Members of Chartered groups are members of the Association.

Change the remainder of Section 2 and throughout the Constitution and Bylaws to read, add or delete Chartered Group, International Affiliate, Chapter or Council as appropriate for the intent of this resolution.

Add Article III, Section 2, para. 2.6 to read as follows:

2.6 An International Affiliate may be chartered by the Board of Officers. Its affiliation shall be in accordance with the contract negotiated with representatives of the area to be chartered and APCO-International, Inc. Such contract to be approved by the Board of Officers. There shall not be more than one International Affiliate per nation. The International Affiliate may charter chapters of its affiliate, but Executive Council representation is limited to the affiliate only.

VI. Bylaws Article I, Section 2.

Active Member: and Paragraph 2.1 shall be amended to read as follows:

Section 2. Active Member:

The following persons shall be eligible for Active membership:

2.1 Administrative and supervisory personnel responsible for planning, organizing, staffing, directing and controlling functions required in the design, construction, installation, maintenance, command and operation of public safety systems and supporting information systems. Such persons must be employed by or be a

volunteer of a governmental entity or a contractor of a governmental entity providing the described services. Members must be actively engaged in the performance of the described services for the specific entity on a regular basis and may not have a conflicting commercial interest which provides a significant portion of their income. ■

RESOLUTION NO. 2

INTENT: To amend the APCO, Inc. Constitution

PURPOSE: To provide for full Immediate Past President representation on the Executive Council.

MAKER: The Constitution and Bylaws Committee.

TO: The 1993 Annual Conference Quorum.

WHEREAS: In the event of the resignation of one or both of the two most recent Past Presidents who serve on the Executive Council, a vacancy would exist which cannot be filled under the existing Constitution or Bylaws; and

WHEREAS: The Association has a fine reservoir of knowledgeable people in those who are Past Presidents; and

WHEREAS: Such background and talent should not be left untapped when a need exists; and

WHEREAS: Upon occasion it is necessary for one or both of the two most recent Past Presidents to resign the position because of job changes, health, retirement or other good reasons which may cause him to become ineligible to serve; now, therefore, be it

RESOLVED: that the Constitution of APCO, Inc. be amended at Article IV, Section 1.1 so that the article reads:

1.1 There shall be an Executive Council. It shall consist of the Association's elected Officers, the two most recent eligible Past Presidents, one member elected by each Chartered Group, and one member elected by the Commercial Advisory Committee. ■

Communications center accreditation ...

What is it, and what's APCO doing about it?

By Paul Linnee • Minnesota Chapter

At the 1992 Annual Conference last year in Seattle, the Board of Officers held a "future leaders" session at which they solicited ideas from members on what APCO is and ought to be doing.

One of the ideas that President-Elect Frank Huggins heard that he liked was the idea of APCO somehow becoming involved in "certifying" or "accrediting" public safety communications centers and their operations.

Frank moved ahead on this idea and has appointed an APCO Committee on the Accreditation of Comm Centers. He appointed the following committee members, based on their expressions of interest in the topic:

- Paul Linnee, Chair, City of Minneapolis (Minnesota Chapter).
- Steve Souder, Arlington County, (Virginia Chapter).
- Dennis Durkin, Glastonberry, Connecticut (Atlantic Chapter).
- Robert Currier, Port Huron, Michigan (Michigan Chapter).
- Don Leach, Ann Arbor (Michigan Chapter).
- Nancy Dzoba, Fort Lauderdale (Florida Chapter).

In general, the process of "accreditation" usually means that

some professional organization researches, develops, proposes and then promulgates a series of "standards" relating how a certain function ought to be performed. Then, agencies that perform that function and wish to be considered for accreditation may apply to that professional organization to have a team of "certified accreditors" come to the facility and conduct an "accreditation audit."

This is a process by which the "accreditors" determine whether or not the applicant agency does or does not meet the prescribed standards.

If the agency meets all or a certain percentage of the standards, then it is issued an Accreditation Certificate and Credentials which it may then use to demonstrate that it does its function at least as well as a set of minimum standards says that it should be done.

Accreditation has become a big deal in our sister profession of law enforcement, and many of you may have heard of the Commission on the Accreditation of Law Enforcement Agencies (CALEA). It is believed that the NFPA and/or the IAFC also are

moving this way for the fire services, and hospitals have long been in the accreditation game. The issue before the APCO Committee on the Accreditation of Comm Centers (ACACC, perhaps we could call it "ACK ACK"!)

1. Write a letter to the Committee Chair before August 5, 1993, in which you set forth your views on the issue. Your letter will be shared with the full committee when it meets at the Annual Conference in New Orleans.

2. Attend an open session of the ACACC Committee at the Annual Conference on Wednesday, August 11, from 3 to 5 p.m. in Superdome Room 6 and present your views in person and share in the discussion.

Here's one person's vision of what this process and system might end up looking like: Imagine that the administration of ACACC becomes a "permanent arm" of APCO, Inc. with Headquarters in Florida and a minimal staff.

the work to identify, publish for comment and eventually adopt and promulgate a set of very specific standards for Comm Centers. Maybe on topics like the number of phone lines you should have per thousand persons served, the number of dispatchers per channel managed, the number of 9-1-1 operators for population served, the type of back-up radio service you should have, the type of power back-ups you should have, the kinds of things you should record and how long you should keep recordings, the kinds of screening and training you should have for staff and so on and so forth.

The Centers look at them, use them as guides for upgrading their facilities and when they think they meet the standards, they apply to ACACC for accreditation and submit an application fee. That fee (likely on a sliding scale by agency size but not a small fee) is used by ACACC administration to pay to get an ACACC trained and certified "Accreditation Team" to that agency's facility to conduct the audit.

This could become a very large, exciting APCO effort which could contribute substantially to the upgrading and professionalism of the public safety communications function everywhere. Now is your chance to have input at the ground floor. Don't let it pass you by! See you on August 11th at the Superdome.

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