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ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS OFFICIALS INTERNATIONAL, INC.

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WARNING

Public Safety May Be Forced to Vacate 2 GHz Microwave Band as a Result of FCC Action

Separate Statements By 2 Commissioners

Commissioners Andrew C. Barrett and James H. Quello issue separate statements with the Commission's Opinion and Order in which they express concern about public safety's plight in the relocation of 2 GHz frequencies. *Page 2*

Senator Bumpers Questions FCC Action

U.S. Senator Dale Bumpers (D-Arkansas) asks FCC Chairman Reed Hundt some very pointed questions regarding the failure of the FCC to abide by legislative intent regarding the 2 GHz issue. *Page 3*

By APCO Legal Counsel Robert M. Gurss • Wilkes, Artis, Hedrick & Lane • Washington, D.C.

In a surprising and disappointing reversal of a prior ruling, the FCC has eliminated rules that would have allowed public safety microwave users to remain on the 2 GHz band indefinitely. Previously, public safety licensees had been encouraged, but not required, to negotiate agreements to relocate to alternative frequency bands.

Now, such negotiations are mandatory, with forced relocation a possibility after just five years (albeit only if alternative frequencies are available and relocation costs are paid by the new users).

The Commission previously had reallocated the 1850 to 2200 MHz bands (collectively referred to as 2 GHz) for "new, emerging telecommunications technologies" and allocated the 1850-1970, 2130-2150 and 2180-2200 MHz bands specifically for Personal Communications Services (PCS).

However, in response to arguments by APCO and others, the Commission adopted rules in 1992 to "grandfather" all existing state and local government microwave users of the 2 GHz bands, allowing them to remain co-primary licensees with new PCS providers. Other 2 GHz microwave licensees (railroads, utilities and petroleum companies) were required to enter into negotiations with PCS providers and relocate to other bands.

Then, last July, the Commission narrowed the state and local government exemption, limiting it to "public safety" microwave facilities, which it defined as facilities on which a "majority of communications" are for operations that "protect the safety of life and property." The Commission also adopted arbitrary distinctions between facilities licensed based upon eligibility in Police, Fire and Emergency Medical Radio Services and those licensed based upon eligibility in other Part 90, Subpart B, Public Safety Radio Services. APCO and others filed petitions with the FCC objecting to that narrowing of the public safety exemption.

In its most recent action, on March 8, the Commission took yet another step in the wrong direction and eliminated the public safe-

ty exemption altogether. This was in direct conflict with express Congressional intent that public safety users of the 2 GHz bands not be required to relocate.

In 1992, the Senate had passed legislation offered by Senator Ernest Hollings to codify a mandatory negotiated relocation procedure, but with an amendment offered by Senator Dale Bumpers to grandfather public safety users. However, because the Commission subsequently adopted similar rules (including the public safety exemption), the Senate withdrew its legislation. Nevertheless, the Senate's action reflects a clear legislative intent that public safety users not be forced to move. It is unclear how, or if, the Commission will reconcile its latest action with this legislative intent.

... all 2 GHz microwave users should proceed to re-evaluate their situation and prepare for possible negotiations with PCS providers. The negotiation process is likely to begin this year ...

As a result of the Commission's action, many state and local government users of the 2 GHz band will now be required to expend considerable time and resources in lengthy negotiations and disputes with PCS providers. They also face the disruption and possible degradation of service that could result from a forced relocation to other frequencies.

Fortunately, the Commission's latest rules limit forced relocation to situations where microwave licensees are provided with free replacement facilities that "fully meet" their communications needs (at least in theory). Prior to forced relocation, microwave licensees also will have an opportunity to negotiate mutually beneficial relocation agreements with PCS providers.

Microwave users meeting the Commission's narrow public safety definition (i.e., facilities on which a majority of communications are for operations that protect the safety of life and property) will be subject to a five-year transition period during which negotiations can occur. The five-year period consists of four years of "voluntary" negotiations (commencing when the FCC accepts PCS applications), followed by one year of "mandatory" negotiations with PCS providers.

Microwave licensees that do not qualify for the public safety exemption will be subject to a shorter two-year negotiation period (one year voluntary, one year mandatory). Note that special rules and procedures apply to the 1890-1930 MHz band which has been allocated for "unlicensed PCS" devices such as wireless computer networks and wireless PBXs.

If no agreement is reached by the end of the mandatory negotiation period, the FCC could require a microwave licensee to relocate if it is provided with new facilities that "fully meet" its communications needs and the PCS provider agrees to pay all of the relocation costs. Therefore, while negotiations are likely to center on the cost and acceptability of the replacement facilities, some PCS providers also may offer incentives to encourage microwave licensees to vacate their frequencies well before the expiration of the mandatory negotiation period (which could be as long as five years).

The full text of the FCC's March 8 Order had not been released at this writing at the end of March. APCO will be reviewing the text carefully and exploring possible responses.

While the Commission's elimination of the public safety exemption is subject to reconsideration and possible reversal, all 2 GHz microwave users should proceed to re-evaluate their situation and prepare for possible negotiations with PCS providers. The negotiation process is likely to begin this year, especially for microwave systems in or near metropolitan areas. ■

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Separate Statements by 2 Commissioners Show Their Concern for Public Safety

Commissioners James H. Quello and Andrew C. Barrett issued "Separate Statements" in the above matter.

Commissioner Quello's Statement:

I agree with the conclusion in this Memorandum Opinion and Order that the incumbents, including public safety entities, in the 1.8-2.2 GHz band will likely experience difficulty sharing this frequency band with the new entrants, including PCS providers. I have concerns about the process by which the Commission came to this conclusion and the procedure for relocating these critical public safety communication service providers.

In light of our previous decision to grandfather indefinitely a narrowly defined class of public safety entities, I believe that this Commission should have apprised the public safety community of this impending change. The Commission staff could have worked with representatives of the police, fire and emergency medical communications providers to explore other options such as transition timeframes and, in some cases, technical ability to share the band.

I am hopeful that the combination of a voluntary and mandatory five-year total period of negotiation together with the requirement that the new entrants pay for alternative communications systems acceptable to the displaced public safety providers will ameliorate the disruptive effects of their eventual removal from this spectrum band.

Nevertheless, these procedures may not be adequate in every situation. For example, in rural communities, it may be possible to design new PCS systems around the less densely used existing public safety communications microwave links, while in heavily congested urban environments complete relocation of public safety equipment may be the only technically viable option.

Before removal of public safety from the new technology band, the Commission must assure the public safety community that there is spectrum available for their relocation and that the transition will not cost public safety entities additional money or disrupt the provision of their essential services.

Commissioner Barrett's Statement:

Today, we adopt an Order which clarifies and refines the availability of spectrum for emerging technologies. This action on reconsideration generally provides more flexibility for moving incumbent fixed-microwave users within or from emerging technology bands, and provides more flexibility for relocating band channel pairings.

I write separately to express my concern that the five-year relocation plan for public safety entities does not result in any harm to their ability to continue to operate or serve the public in any way. Although I support the various relocation safeguards for public safety entities delineated in this reconsideration Order, it is not my intent to support any actions which will harm or interrupt public safety operations.

Thus, if public safety entities, such as defined by this reconsideration Order, believe that additional procedural safeguards are required to support their ability to operate without disruption, then I will closely review the need for further reconsideration in this regard. When the Commission undertakes decisions such as this on its own motion, particularly where it reverses a prior Order, then I am prepared for the possibility of additional action upon further reconsideration. I will monitor the response to this reconsideration Order in order to assess the need for such action here. ■

Senator Bumpers Questions FCC About Failure To Abide by Legislative Intent Regarding 2 GHz

At the recent hearing on the FCC before the Senate Appropriations Committee, Senator Dale Bumpers (D-Arkansas) asked FCC Chairman Reed Hundt some very pointed questions regarding the failure of the FCC to abide by legislative intent regarding the 2 GHz issue.

After the hearing, Senator Bumpers issued a news release in which he said the FCC's new policy would force public safety users such as the Arkansas State Police to a higher radio frequency band.

"The potential costs would be staggering," he said.

Senator Bumpers said that when a similar policy change was proposed two years ago, legislation was drafted by him and added to the FCC's funding bill in 1992 that protected any current public safety users from a forced move to higher frequencies. The FCC later adopted its own rule identical to the Bumpers language, and the Bumpers legislation was dropped.

His news release noted that in a reversal of policy designed to foster a new personal communications system in the private sector, the FCC (in April) said it would provide a grace period of five years, after which time all 2 GHz users, including public safety as well as railroads and utility companies, would be forced to move.

Bumpers said, "The Arkansas State Police spent $30 million recently for a new communications system. With this new rule, the State Police will have four years in which to negotiate with private industries for compensation in exchange for moving to a higher frequency. If an agreement has not been reached for adequate compensation, then the FCC would use the fifth year to arbitrate a deal that may or may not be in the best interest of the Arkansas State Police. I have some real concerns with that."

He told FCC Chairman Hundt that the cost to put a new communications system in place for the Arkansas State Police would be much greater than the $30 million cost of the existing system. Bumpers also said that he did not believe that the FCC was the best party to determine proper compensation in a final agreement between current users of the radio spectrum and the private companies wanting to come on board.

"I have to tell you that I am bothered by this new rule for several reasons, not the least of which is that I understood that this issue was taken care of two years ago," Senator Bumpers said. "Having said that, I am very concerned about the FCC having final authority as to whether a current user is getting a fair shake in this buy-out process." He also said he intends to offer legislation which would extend the length of time current users of the 2 GHz radio spectrum have to leave the frequency band.

"I believe it will encourage better bargaining for our police, fire and ambulance services if the length of time under this rule is extended -- possibly to 10 years," Senator Bumpers said.

He said that legislative action on the issue is not expected until the FCC's appropriation legislation is considered a few months from now. ■

PROJECT 25: TDMA-FDMA & Spectrum Efficiency

By Art McDole • APCO Project 25 Steering Committee Member

Although Project 25 has been on-going for more than four years, it is evident that there is still considerable misunderstanding, particularly among non-technical persons, of some of the claims that have been made for spectrum efficiency through the use of TDMA.

For those who may not understand this acronym, it stands for Time Division Multiple Access. In contrast, FDMA, Frequency Division Multiple Access, is the method chosen as a standard by Project 25. Briefly, TDMA takes a channel of a given width, say 25 kHz, and divides it into time slots, two or more, so that two separate signals may flow over the same channel. FDMA would divide the same channel into two separate, 12.5 kHz channels, side by side, to accomplish the same goal.

Although there are certain advantages and disadvantages to each method, the one in particular which will be discussed here is the claim of one manufacturer for increased spectrum efficiency through the use of TDMA.

The purpose of this article is not to examine other questions about TDMA which have been raised, and which remain still unanswered to some degree. These include possible physiological

hazards, possible synchronization problems with long-path simulcast systems, the difficulty of use for direct mobile-to-mobile communications, and the difficulty of developing a method of communicating with current FM equipment. Rather, it will deal only with the claims for greatly improved spectrum efficiency, which appear to be based on those factors which are carefully calculated to prove the case.

This claim of spectrum efficiency is presented on a purely mathematical analysis, particularly in the 800 MHz region, and ignores the actual operational use of the spectrum in total, as well as the proven needs of the public safety user. The Project 25 Committee has, from its inception, stated that its goal is to consider the entire spectrum allocated to public safety, not just 800 MHz, and to develop standards which will best fit operational and spectrum requirements, both present and future.

It is a very simple matter, in theory, to take a 25 kHz channel and divide it into four paths through the use of TDMA and compare it to two channels which would be the first step with FDMA in the 800 MHz portion of the spectrum. This leads to the erroneous conclusion that TDMA is twice as effective.

The primary measure of spectrum efficiency is not the number of communication paths that can be theoretically established in a given portion, but must consider the actual usability of that portion of the spectrum. An examination of the present use by public safety reveals that the majority of licensees, particularly below 800 MHz, are individual agencies, utilizing one or two channels, often with loading less than 35 mobiles. (In fact, FCC records indicate of the Part 90 public safety licenses, more than 80% fall into this category).

The need of a small agency for a public safety channel which will ensure clear communications in a police, fire or medical emergency is just as great as that of a larger entity. Dedicated channels must be provided for this purpose. Further, our democratic society (and the Commission's rules) preclude mandating consolidation and guarantee the right of each individual entity to its own channel.

There is an acute shortage in virtually all portions of the spectrum and in most areas of the country. The need for additional channels is not merely to expand existing systems, but to create new ones, and, as in the VHF high band, to change simplex systems to a mobile relay mode of operation.

This shortage exists both in rural and urban areas. Radio propagation cannot be controlled to precisely fit the area of responsibility of a governmental agency. Geographic separation between systems is always necessary to ensure channel reuse without destructive interference. Through FDMA, additional individual channels can be obtained to fit the needs of individual agencies as channel widths are narrowed.

Adding channels through the use of TDMA (time division) is basically of value only to a single agency, either small or large, and does nothing for others who need one or more separate channels. This is particularly true where an attempt to create a consolidated trunked system and use TDMA for this purpose might well require expanding the overall coverage area of a number of channels. This, then, would be counter productive regarding spectrum efficiency. Frequency division of the spectrum results in channels which can be used as most needed, either in a conventional or trunked mode, and at the same or geographically separate sites.

It also must be considered that FDMA (frequency division) allows each channel to be utilized to its fullest extent, either by one or more agencies, whereas with TDMA if channels are created by time division for use by a single agency, they must be fully loaded and utilized to result in actual, rather than theoretical, gains in spectrum efficiency.

Additional channels are needed in all portions of the spectrum, and on an urgent basis. TDMA may offer long-term relief in certain instances, but requires change out of entire systems before any advantage can be realized, and even then, only by a single agency. Conversely, new channels created by FDMA can be used on a selective basis to offer short-term gain to either the same or other agencies.

TDMA appears to have its principal advantage in large, trunked systems in the 800 MHz portion of the spectrum. However, by the time suitable equipment can be made available, the potential for creating new systems may be past, due to shortage of spectrum and lack of need, as many large systems are now being established using existing technology. This is particularly true in major metropolitan areas, where even the NPSPAC channels are fast becoming fully loaded with new analog systems which must be amortized before full migration to new digital systems may be economically feasible.

Migration paths also must be considered in the claim for spectrum efficiency. As new channels are created through frequency division below 800 MHz, as they surely will be through the present "Refarming Docket," use of narrow-band equipment will result in an almost immediate gain in spectrum availability. The same advantage will be true in other portions of the spectrum, as narrow-band equipment can be employed in both existing and new systems to provide usable channels within a short time frame.

In conclusion, a brief summary of the Part 90 channels will illustrate the actual spectral advantage of FDMA as a whole. The illustrations given are for only the first step in FDMA, while the stated goal of the Committee is a two-phase approach, with the second step providing additional spectrum efficiency. This second phase could be either FDMA or TDMA, based on the respective merits of each method at that time.

VHF 150-170 MHz

• 25 kHz equipment is presently used with 15 kHz channel spacing, and geographic separation. With 12.5 kHz equipment, additional channels could be added immediately on a selective basis. Ultimately, a gain in excess of 100% could be realized.

UHF 450-470 MHz

• 25 kHz equipment with 25 kHz channel spacing is utilized. If one ignores the existing use of 12.5 kHz low-power equipment, a 100% gain would be possible with true 12.5 kHz equipment. However, this secondary use cannot be disregarded, and unless a new home is found for this purpose, actual gain will be limited, either with FDMA or TDMA.

UHF 470-512 MHz
(T Band)

• Uses 25 kHz equipment with 25 kHz channel spacing. Use of 12.5 kHz equipment would result in an immediate gain, with 100% or more ultimate advantage, as digital equipment is utilized.

806-821/851-866 MHz
-- Public Safety and General Access Pools

• 25 kHz equipment with 25 kHz channel spacing is used. The 12.5 kHz equipment and spacing would result in a long-term advantage of 100%. Further, and perhaps more rapid, advantage could possibly be gained by utilizing a 6.25 kHz offset plan, just as is now being accomplished at 12.5 kHz in the NPSPAC Plans.

821-824 MHz NPSPAC

• 25 kHz now utilizes improved equipment with 12.5 kHz channel spacing and geographic separation. The claims for an advantage for TDMA cannot be ignored.

It could perhaps result in a 100% gain versus an estimated gain of 33% for FDMA in the first phase, and in certain systems. However, this is not the whole picture because it is here that new, large systems, as stated above, have been and are in the process of being installed. The potential for new digital systems, particularly in metropolitan areas, is not great because the existing systems will not be able to readily change out for at least seven or more years.

Through the proposed use of FDMA, with dual-mode equipment, an almost-immediate gain could be realized as systems need to be expanded. As stated, the second phase would provide the potential for further improvement in spectrum efficiency. ■

APCO AFC to Begin Using Electronic Data Interconnect With Other Coordinators

For the past year or so, APCO AFC has been inundated with requests from the two other 800 MHz coordinators for concurrence for usage in the General Access Pool (first 150 channels). APCO has had to enter as many as 700 of these applications into its main data base in one month (an average of 60% of AFC's total applications).

At an average of four minutes per application, this has slowed the data entry department to the point where AFC has had to hire additional personnel to keep up.

Based on APCO's concerns, Ralph Haller of the FCC created a task force of APCO, National Association of Business and Education Radio (NABER) and Industrial Telecommunications Association (ITA) personnel to resolve the situation. This task force met in Washington, D.C., in March and made recommendations to resolve the problem.

The solution: Electronic Data Interconnect (EDI).

EDI will revolutionize the way we perform interaction among coordinators in the 800 MHz band. Under EDI, FCC application data that is currently entered manually will be entered electronically. When this project is complete, APCO will merely check 800 MHz applications from other agencies for conflicts and respond when a public safety user of a particular frequency will be affected by the proposed applicant.

While this will not eliminate the need for processing the application, it will shorten the amount of work done on these applications which currently earn no revenue for AFC. APCO AFC began steps to electronically transfer data at the end of March, and the project is expected to be completed and in action by August. This marks an advancement process for AFC which will lead to programs and procedures designed to enhance its ability to serve public safety communications.

It is important to note that continued rapport and cooperation among the three 800 MHz coordinators mark a big step for APCO and coordination in general. ■

Committee Developing Professional Qualification Standard for the Public Safety Telecommunicator

Ted Vratny • Chairman, NFPA 1061 Committee

The National Fire Protection Association (NFPA) has empanelled a technical committee to develop a professional qualification standard for the public safety telecommunicator. This project has been identified as NFPA Standard 1061. The committee is known as a Technical Committee on Professional Qualification for Public Safety Telecommunicators.

The project was established by the Association's Standards Council based on input received from several public safety telecommunicators who requested a professional qualification standard for the job. The Standards Council then advertised for public input, the majority of letters received being in favor of the project. Committee members were sought and, in 1992, the Standards Council appointed 20 members.

It is important to note that while this is a technical committee of the NFPA, the scope of the committee's work is for all public safety, not only the fire service. As such, the membership of the committee is reflective of the public safety community as well as the entire nation. The makeup of the committee includes telecommunicators, telecommunications supervisors and management, telecommunications trainers, consultants and other associated professions. The agencies represented on the committee include local agencies, county agencies, regional agencies, state organizations and federal installations.

The geographic distribution of the committee members ranges from Connecticut to California, from Minnesota to Texas, and includes places in between such as Utah, Colorado and Ohio, to name just a few. More than half of the committee members are active APCO members.

The technical committee has been at work for nearly two years and is preparing the draft of the professional qualification standard for release late this summer. The committee has worked hard to keep this document a minimum standard for the job of telecommunicator. Careful attention has been given to the needs of the single-telecommunicator operation as well as to the telecommunicator working in a large, multi-telecommunicator, two-stage, computerized operation.

The finished product will provide a realistic base for both types of agencies. As a minimum standard, this document will serve as a base, or to augment those states that already have standards, or a set of qualifications in effect.

Accompanying the standard are appendices which speak to the communications process and to the training of telecommunica-

tors. These appendices are not standards or requirements, but serve as guidelines for use by agencies when developing their own programs. The training appendix is a detailed document which interacts nicely with the APCO training program.

An important part of the NFPA process is public review and comment. These review periods allow professionals already doing the job to provide input to the technical committee regarding the proposed standard.

The technical committee's work on an initial draft of the document will be completed later this spring, and the draft will be available later this summer for public review and proposals for change.

This initial review period will extend into early next year. The technical committee will review every comment and proposal and then, in response to the comments and if need be, make changes to the document. There will be a second review and comment period in the fall of 1995. A final form of the document will be presented for adoption by the Association in May of 1996.

It is important to the committee to gain the input and support of their fellow APCO members. Representatives of the 1061 committee have requested the opportunity to present a program at the APCO Conference & Exposition in August at Pittsburgh. In that presentation, the committee will provide more information about the standard and about how APCO members can have input to the document.

About the Author

Ted Vratny is Director of Emergency Communications for the Boulder Regional Communication Center in Boulder, Colorado. He has held that position since November of 1991.

Prior to that, he was Director of Communications for 14 years for DuPage Public Safety Communications in Wheaton, Illinois.

Ted has been an active member of APCO since 1987 and has served in a number of offices in the Illinois Chapter of APCO, including president. He has been a member of the National PAC Committee and an FCC convener for both the Southern Lake Michigan Region and the Illinois Region. He was chairman for the Region 54 (Southern Lake Michigan Region) 800 MHz Planning Committee. He is currently serving as chairman of the NFPA 1061 Committee. ■

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