Associated Public-Safety Communications Officers, Inc.

Arizona Chapter

P.O. Box 3413, Phoenix, Arizona 85030-3413

President
Shannon Fitzsimmons
Rural / Metro Fire Department
755 West Grant Road
Tucson, AZ 85705
602-544-5901
FAX: 602-628-8272

President Elect
Steven K. Freeman
City of Tucson
Communications Center
P.O. Box 27210
Tucson, AZ 85726-7210
602-791-4803
FAX: 602-791-5421

Vice President
Michael J. Zakrajsek
Phoenix Fire Department
Fire Computer Services
620 W. Washington, Rm 465
Phoenix, AZ 85003
602-262-5008
FAX: 602-534-1108

Secretary
Henry Zappia
University of Arizona
CCIT Telecomm. Room 131
Tucson, AZ 85721-0001
602-621-6718
FAX: 602-621-9222

Treasurer
John R. Albin
City of Mesa
Communications Division
P.O. Box 1466
Mesa, AZ 85211-1466
602-644-3172
FAX: 602-644-3173

International Executive Council Member
Jim Wortham
City of Phoenix
Fire Department
620 W. Washington
Phoenix, AZ 85003-2132
602-262-4433
FAX: 602-534-1108

Western Regional Conference
Debbie Overton
Maricopa County Sheriff's Office
102 W. Madison
Phoenix, AZ 85003-2135
602-256-1029
FAX: 602-256-1997

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

May 24, 1993

Ms. Donna Searcy
Secretary, FCC
1919 M Street NW
Washington, D.C. 20554

Dear Ms. Searcy:

Please accept the enclosed comments in FCC Docket 92-235 Frequency Refarming. You will find a total of eleven copies.

Sincerely,

Don Pfohl

Don Pfohl
Arizona APCO Chapter
Regulatory Review Chairman

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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
Replacement of Part 90 by Part 88 to	)	
Revise the Private Land Mobile Radio	)	**PR Docket No. 92-235**
Services and Modify the Policies	)	

Arizona APCO Chapter
Comment to FCC NPRM 92-235

Contents

To: The Commission

The Arizona APCO Chapter is pleased to submit its comments in the above titled Notice. The Arizona Chapter of the Associated Public Safety Communications Officers, Inc. (Arizona) is a chartered chapter of the International Associated Public Safety Communications Officers Inc. (International.) Arizona's membership stands at 195 individuals who represent large and small agencies throughout Arizona in facets of Public Safety communications. Arizona generally supports the comments of the International in this Notice but has chosen to offer comments itself because of the need to assure that the particular needs of mountainous western states are addressed. Arizona has been a participant in the development of the International's comments as well. Arizona commends the Commission for instituting this proceeding and believes it to be a painful but necessary measure.

Summary

Arizona proposes that a separate rules section for Public Safety should again be established. This rules section should describe a flexible set of rules which would continue the traditional Public Safety Radio Services with the addition of the newly established Emergency Medical Radio Service. Because of the diverse needs of the different sections of Public Safety, we further propose that a new national plan should be developed and regional planning efforts should be organized.

Among technical parameters which should govern Public Safety frequency use in the future on frequencies below 800 Mhz, we feel radio wave propagation should be taken into account in the assignment of frequencies. In general, frequencies above 400 MHz should be used in metropolitan and small area locations, and frequencies between 25-400 MHz should see emphasized use in rural and wide area applications. Trunking on specific frequencies between 150-174 MHz should be incorporated into the rules and not left to use only where it might be feasible. The new rules should also allow the continued use of mobile relays between 150-174 MHz as well.

We suggest that the first step in creating more frequencies should be a frequency

alignment based on a 12.5 KHz alignment in all bands above 50 MHz. Further channel splitting should wait until a possible future proceeding only when it is a proven technology. The time table we suggest would establish the 12.5 KHz channels between 50-174 MHz five years after the date of the Report and Order, and all systems should be fully 12.5 KHz operational ten years after the date of the Report and Order.

Of major importance to us is confining transmitted signals to the boundaries of the licensed entity. In order to do this, we suggest applicants should submit engineering data consistent with regional plans to the frequency coordinator as part of their applications. The rules should set maximum boundary signal levels by use of coverage contours, and frequency reuse should be predicated on a protection ratio and not upon mileage.

The single most critical element in our minds is the placement of frequency use planning and control at the Regional level. The Region should be allowed to decide where frequencies are to be used (and reused) and for what purpose. The community itself as a Regional Committee must be able to ultimately prioritize the needs of the region irrespective of Radio Service designations on specific frequencies. We feel that the continued use of individual radio services for the present time is a method that will allow divergent users to be accounted for and to make sure of the continued representation of the interests of users of specialized systems.

Comments

Separate Public Safety Rules

Arizona proposes that a separate Part of the rules should be set up for the Public Safety Radio Services. We believe that Public Safety's existing radio services within this service should continue to exist since they represent varied interests and systems which are unique from each other. Although we would like to see these services remain, we also advocate that a service/ frequency realignment be done. The purpose of this is to simplify frequency coordination by reducing the number of adjacent channel coordination possibilities as much as possible. We suggest that new frequencies which would be created by the reduced channel

spacing should go into a generic Public Safety category. We feel this can be accomplished both through the coordination process and at the time when channel spacings are changed.

National - Regional Planning Process

It is our feeling that flexibility in assigning future licenses must be available at a Regional level. We suggest, therefore, that another National Plan and then a Regional planning process are in order. Since the first Regional Planning groups were primarily concerned with 800 MHz systems, we propose that a new planning process should be started. In that way, users who declined to participate in the 800 MHz NPSPAC process can be involved in planning for use of the sub 800 MHz bands. Likewise, even the original region boundaries at 800 MHz are probably not appropriate at the lower bands. Frequency usage should be driven by regional needs. For example, many states have high probabilities of wildfire situations which require communications solutions that other regions simply do not need. Arizona's needs are different than Boston's, and Boston should not be constrained by any rules written to solve Arizona's problems. They need to be free to use the resources to solve their own problems just as we need to be free to solve our own. We are suggesting a five year period before a frequency realignment, and we suggest further that this five year time could be devoted to development of a national and subsequent regional plans.

In addition to mandating another planning process, we believe the Commission must give the recognized regional oversight group some latitude to suggest waivers or to suggest a speedup where it deems these necessary. For example, if region plans require system changes at certain intervals in order to facilitate the process, the Commission should rarely not concur. As seen in the attached Appendix B, it is possible to organize mobile relay pairs, trunking pairs, and to hold certain bands for mountaintop transmit use. We do not suggest this would be a painless process, but in order to keep it going, the regional group would have to have some authority. One way the Commission could aid this process would be to require concurrence of the Region on any application for a new frequency, system, or site by an individual applicant.

Propagation Use by Location

We think that one of the long term goals of the changes sought by this proposal should be to encourage the usage of frequencies based upon the applicability of their propagation characteristics. We suggest continued usage of 25-50 MHz spectrum as it is now. Because of the problems associated with noise on the 25-50 MHz band and the unpredictability of skip, we think it is not appropriate at this time to narrow bandwidths nor make other changes in this band. At 72-76 MHz, however, we concur with reduction of bandwidths as being possible and desirable.

Arizona is convinced that the long term usage of the 150-174 MHz band (at least in Arizona) should be changed to favor wide area applications. This band has the advantages of less noise than the lower bands, availability of gain and directed antennas, good propagation in almost all foliage conditions, and good wide area coverage from single sites. We feel it is a misuse of the resource to allow small local uses of frequencies in this band that prevent their use for wide area applications. To the maximum extent possible small local applications should be on higher frequency bands where cochannel reuse distances could be shorter. If our Regional planning group was given the authority to make these decisions for Arizona, we would do so. In other regions where this need might not be evident, they could use the spectrum as they needed it.

The 421-430, 450-512 and over 800 MHz bands should find long term use in metropolitan areas and in areas where propagation characteristics of these bands are appropriate. There are areas in Arizona (mountainous and canyon areas) where use of 450-470 MHz frequencies over wide areas actually works very well. Wave propagation characteristics in this band see signals reflect off of hard surfaces; where fill-in can be used, these frequencies work well. In other cases severe shadowing in low areas behind mountains can make the use of 450-470 MHz systems inappropriate. We suggest 800 MHz use at prisons and in small, local applications is excellent regardless of whether they are in urban, suburban, or rural locations. As systems must change to meet the effect of these new rules, spectrum

efficiencies and better use of propagation characteristics should be primary goals.

12.5 KHz Channel Spacings

Arizona believes that ultimately channel spacings of 6.25 KHz in the 72-76 MHz, 150-174 MHz, 421-430 MHz, and 450-512 MHz bands will be possible. We do not think analog

39 or 41 dBu contour respectively. In other words, give an 18dB protection to existing systems.

Trunking at 150-174 MHz

Arizona believes that we must create an opportunity for establishing specific trunking channels at 150-160 MHz. There are many agencies which we feel would avail themselves of this technology if propagation characteristics could be used with trunking to make cost effective wide area, statewide, and ribbon systems practical. We are, therefore, advocating the introduction of twenty paired channels that could be available to create a nationwide, Public Safety VHF trunking infrastructure. Because of the fractured nature of the groups of frequencies between 150 and 174 MHz, we feel identification of very specific nationwide channels is mandatory. Producing these clear channels is difficult because there is no good way to separate transmit-to-transmit and transmit-to-receive frequency pairs. We feel many statewide agencies would eventually migrate to these frequencies vacating those channels they presently occupy. We believe there are federal agencies as well which would eagerly join these systems wherever they were established. The rules should allow this to happen.

We think we have identified a way that VHF trunking frequencies could be used without cochannel separation problems so that checker-boarding of a lot of trunking channels would not be necessary. In keeping with the flexibility we advocate, however, we suggest that these twenty channels could be used as statewide or other wide area mobile relay pairs if VHF trunking is not contemplated within the region. (So long as they adhere to the monitoring provisions we advocate for the mobile relay output frequency.) Appendix A and Appendix B show variations of one way to actually identify twenty new channels which meet the technical requirements that would be necessary to trunk systems in the 150-174 MHz band.

Nationwide Emergency Channels

With a change of channels in the 150-174 MHz band to a 12.5 KHz channel spacing, and high power use of 12.5 KHz channels in the 460-470 MHz band, we also suggest that there would be capacity to establish a nationwide group of five frequencies at 150-174 MHz and five pairs of frequencies between 460-470 MHz that could be allocated to an "emergency"

usage. We see these channels as being similar to the five nationwide mutual aid channels in the NPSPAC spectrum. We view these as not being service or usage specific. We propose that they should be available nationwide, for tactical use by all levels of government for emergency

Innovative Shared Use in Public Safety

We strongly disagree with the proposal to place Innovative Shared Use systems within the Public Safety spectrum. This not only takes away from Public Safety some of the channels that would be derived from channel splitting, but it also creates a myriad of technical, operational, coordination, and flexibility problems as well. Maintaining consecutive frequencies within one service greatly eases the coordination burden. It also could give the coordinator and system planner the ability to stack channels to best use spectrum efficiencies that become available. At the same time, in the real world, living adjacent to commercial interests often creates a great many problems for Public Safety licensees. The Public Safety community locally tends to be a fairly cohesive group which cooperates to forestall and to solve problems. Getting such cooperation out of some commercial interests is also easy, but it can be extremely difficult to impossible from others. In our mind, the best solution is to not place SMRs or any other such use within the same consecutive frequencies with Public Safety.

Exclusive Use

One of the Commission's proposals which we find a great deal of support for is Exclusive Use. We would like to see Regional Planning involvement in this process, within Public Safety, however. The Commission's proposal presupposes that these systems could happen at 50 mile intervals. Where some of the Public Safety community uses systems which cover hundreds and thousands of square miles, the Commission's definition of Exclusive Use can be inappropriate. The Regional Planning process, at least in Arizona, would be broad based enough so that real world decisions would be made on granting wide area exclusive use. For example, an exclusive use grant could be limited by a realistic assessment of where frequencies were actually used and by the realistic use of channel loading numbers.

We see problems in both the definition of where systems are used and in the number of units actually using the frequency in each location. The present licensing process simply counts the total number of radios used by an agency as though they were used throughout a system. This count also does not recognize the fact that in much of Public Safety, one person

may have two or more radios both of which wind up in the loading count. Frequently Public Safety personnel have both a mobile and handheld radio. At the same time, systems are frequently licensed as wide area (statewide, countywide, etc.) while they are actually only used on a district or local basis. The effect of this can be to artificially remove frequencies from consideration of further use. This can certainly enhance the future options of the licensee, but it should be limited. We believe Regional Review could agree to substantiated use of frequencies where this was appropriate, but not agree in cases where it was not. These nuances we believe are too complicated and local in nature to deal with by rules. We feel they can be dealt with locally. At the same time, these issues could be political enough to not want this discussion to take place at the coordinator's level, but rather it should occur at a Regional Plan level.

Loading Standards

We are pleased to see your proposal regarding different loading levels by band and by location. Some systems require usable frequencies in remote locations for limited numbers of radios. An example is in highway maintenance organizations. Frequently such systems can be used by small offices and maintenance stations. The function of such stations can be not only maintenance and repair of roadways and bridges, but also snow and landslide removal and recovery from floods. The functions are especially critical in western, mountainous states, and they are in every sense Public Safety. Many of these operations are hazardous to the personnel involved in them as well as being hazardous to the public. We suggest it is appropriate to suggest a lower number of radios for system loading in such cases. We feel your proposal of 70, 50, and 20 mobile loading by location is appropriate.

For Exclusive Use Overlay (EUO) wide area systems we favor your second option. This option says that loading criteria would be essentially proportional to the total geographic area protected from further licensing when each site is provided the standard 80 kilometer protection. The example given in the Notice discussion resulted in protection of 100,000 square kilometers with ten sites. In the case of Arizona, with its area in excess of 183,000

square kilometers, Exclusive Use would thus require about twenty sites. In fact, Arizona Game and Fish Department uses twenty-four sites in its statewide radio system so we think your example is well chosen.

Consolidation of Radio Services

Arizona supports retention of the Local Government Radio Service, Police Radio Service, Fire Radio Service, Highway Maintenance Radio Service, and Forestry Conservation Radio Service plus the addition of the Emergency Medical Radio Service as the component parts of the Public Safety Radio Services. We agree with one of your options that suggests each of these services could retain the frequencies now in their service with new frequencies going into a Public Safety category.

We suggest that these existing service specific frequencies might only be saved initially, however. It is our suggestion that as frequencies might be relinquished by licensees going to other bands or to trunking or other technologies that vacated frequencies should be placed under Regional Planning authority. These frequencies should then be treated as Public Safety and assignments should be based upon regional need and not upon service.

We suggest further that in the 150-174 MHz band when a new channeling plan goes into effect that channels should be assigned to individual services in consecutive order. As we previously suggested, one future possibility should be the stacking of bandwidth to facilitate future advanced technologies. Many police departments are beginning to talk about transfer of mug shots to the officers in the field and the transfer of fingerprints into automated systems from the field. We believe more bandwidth will be required for these uses and having contiguous channels in a single service will facilitate such uses.

These contiguous frequencies should be the responsibility of the frequency coordinator for that service. If at some later date channels are further split, each of the new channels within each coordinator's block should then also be the responsibility of that coordinator. This will minimize the number of cross coordinations between coordinators and will also allow better planning and use.

For the frequencies between 450 and 470 MHz, we suggest that APCO should be recognized as the sole coordinator of all frequencies except for those within the Emergency Medical Service. It seems to us that the complexity of the existing coordination process is not warranted by the actual use. The vast majority of licensees in this band are police and local government anyway. At the same time, we suggest that all of these frequencies except for those within the Emergency Medical Service should revert to a Public Safety class of service. IMSA/ IAFC should continue their coordination of the UHF Emergency Medical Service frequencies.

Transmitter Power/Antenna Height

Arizona agrees that a maximum authorized transmitter effective radiated power (ERP) of 300 watts is appropriate but only within 75 miles of urban areas 1-100. Outside of those areas we suggest no ERP limit so long as service area contours are met. In Arizona we find some existing rural systems are using highly directive arrays to cover very difficult geographic areas. Typically these systems can use up to 2000 watts ERP at UHF. Limiting ERP in such cases would only have the effect of requiring more stations using lower ERPs to achieve the same system result. We strongly disagree, however, with your proposal to derate ERP as a function of height above average terrain for Public Safety.

More than one half of Arizona is above 5,000 feet above mean sea level. Arizona has many mountains with many communications sites located above 8,000 feet AMSL, and often

cochannel reuse level. Frequency assignment under this system is too subjective. We suggest that the commission should only license those systems that Public Safety coordinators agree will meet these two coverage conditions. We think a 39 dBu contour at VHF and a 41 dBu contour at UHF should be accepted as a service area boundary for Public Safety. Whatever combination of site, transmitter power, antenna gain, and antenna pattern is required to achieve that estimated contour should then be licensable.

For cochannel reuse, we think an 18 dB protection level is in order, regardless of separation mileage. Therefore, a cochannel system could be licensed if it did not present more than a 21 dBu signal at VHF or a 23 dBu signal at UHF to the existing station's 39 or 41 dBu contour.

We suggest that existing systems should be grandfathered for their licensed effective radiated power until five (5) years following the adoption of the Report and Order. We think this amount of time is necessary for Public Safety to first go through the engineering to develop contours, to determine whether changes to sites may be necessary, to budget for making changes and to then actually get the work done.

Extended Implementation

We agree that the extended implementation option should be extended to all bands and to any type of licensee provided they can show cause. Our concern is that a great many licensees could face very extensive system replacements of thousands of pieces of equipment, dozens of sites and millions of dollars. We think that some will see the wisdom of trunking at VHF and low UHF. If this indeed happens, many conventional frequencies could be vacated. The emphasis should be on assisting this complicated process wherever possible as long as it results in spectrum efficiency. Extended implementation time is one factor in that equation.

Fixed Operations in the 150-174 and 450-470 MHz bands

We would like to see a significant change take place in this fixed use. We advocate still allowing secondary fixed use but to require that any such use should be done within the applicant's own service. All non-Public Safety systems now on Public Safety frequencies

should vacate them by 5 years after the date of the Report and Order. Likewise, any Public Safety licensees using non- Public Safety frequencies for these fixed uses should be forced to vacate their non-Public Safety frequencies and move to Public Safety channels. There will never be a better time than during such significant changes to get this done.

The benefits, at least within Public Safety, are to better control interference, to reduce the complexity (and thereby the cost to the licensee) of frequency coordination, and to better control the actual use of the system. We have had comments made to us concerning de facto use by some who were licensed for fixed use but actually operated as mobile relays. Apparently some licensees have licensed Public Safety 450-470 MHz band frequencies for secondary fixed use and then proceeded to have mobile equipment use the fixed site as a relay. We feel that pulling all fixed use back within the applicant's service may stop this practice. Once such use becomes established, we find it almost impossible to get rid of it.

Low Power Operations

Arizona suggests that the 12.5 KHz center frequency between high power frequencies in the 450-460 MHz band should remain low power secondary use. At 10 years after adoption of the Report and Order, these frequencies could then be classified for full power. This is the point where we suggest all equipment in use should be 12.5 KHz compliant equipment. We expect at that time that further splitting to some narrower channel spacing could be possible. Through that process, future low power channels could be defined. At least in Arizona, there is fairly heavy use made of these 12.5 KHz channels between 450 and 460 MHz.

For the 12.5 KHz frequencies in the 460-470 MHz band, we propose full high power primary use. As with similar frequencies used within the Special Industrial Radio Service, we suggest that adjacent channel uses should be limited to an appropriate mileage separation from existing licensees. In Arizona, these 460-470 MHz channels tend to be much more lightly used, and with coordination could result in a number of new usable channels.

Because of the existence of 25 KHz equipment in this band, we suggest that any 12.5 KHz systems added anywhere within the 450-470 MHz range prior to ten years after the date

of the Report and Order should only be allowed on a non-interference basis to existing stations. This non-interference status could be determined by the Regional Plan and by frequency coordination.

Old Subpart O-Transmitter Control

We agree that this subpart is superfluous and can be eliminated.

Reduced Paperwork Requirements

Since the Commission does not use some of the technical showings it requires, this information should not be required at all. If we assume that channel splitting does occur, however, it follows that the occasions for interference will be much greater. Adding more and more stations to the spectrum calls for more complex methods of coordination. Our suggestion for Public Safety is that Regional Plans should set guidelines that the coordinator and the applicant both adhere to. In this case more, not less, technical information will be required of the applicant to the coordinator. Once the coordinator approves an application, it should then be presented to the Commission for approval as being compliant with the Region Plan. With increased reliance placed on the Public Safety coordinator, we do not see the need for Commission use of detailed technical information.

Arizona Summary

In the remainder of these comments Arizona will address only Public Safety's interests for our state. We believe that the issues are so complex that we should limit our discussions to Public Safety only. We do not want to appear to be offering solutions for others that might pertain to Public Safety and Public Safety's abilities only. We have a concern, however, particularly for the utilities, petroleum, and land transportation communities. We feel that they should not be considered in total with commercial or other interests. We will offer these radio services our support to a separate treatment for their place in these new rules based upon the critical nature of their service and the radio systems they must have to provide this service. The following comments will be more detailed in the areas cited above.

Specific Comments

Compatibility with APCO Project 25

The International Associated Public Safety Communications Officers, Inc. (APCO), the National Association of State Telecommunications Directors (NASTD), and the Telecommunications Industry Association (TIA) have spent the past two years in what is called APCO Project 25. Project 25 is a standard setting process which will lead to a platform that describes how the next generation of land mobile radios will work. This process will first describe a basic radio; it will then go on to describe interfaces to that radio which allow integrated systems to be built. We strongly suggest that the Commission's solutions for Public Safety in refarming must ultimately interleave with Project 25. At the same time, Project 25 has not been conducted in a vacuum. Participants have included many federal agencies in addition to APCO and industry representatives. Several other countries are also closely monitoring this process as the results will certainly be felt internationally.

It is our understanding that the Intergovernmental Radio Advisory Committee (IRAC) within NTIA has already decided upon a course of action towards 12.5 KHz channel spacing for Federal land mobile systems. We understand that as of 1995, all new systems would have to be implemented as 12.5 KHz systems, and as of 2005, all systems would need to be 12.5 KHz spaced systems. The IRAC decision is not driving our process here, but the communities need to be compatible with each other in the end. Both for our ability to communicate in the field directly with federal agencies and for the ease of the manufacturers to produce the same equipment for both markets, we need to arrive at a common solution.

we do not feel that these solutions are appropriate for all of Public Safety's future requirements. We feel our goal must be oriented towards digital systems.

Public Safety Separation

Public Safety communications systems are critical to the agencies that use them. They are not simply a convenience. In many instances, there is not even a viable alternative. On many of Arizona's hundreds of miles of rural roads and across much of Arizona's landscape, there are no wireline phones, no cellular phones and no commercially feasible carriers. Even in the metropolitan areas, there are no substitutes for private radio systems to police and fire agencies. There is also no cost effective alternative for many metropolitan service systems used by general government.

Because of the critical nature of these systems, public agencies will find whatever means are necessary to maintain them. Because of that, we do not feel it is appropriate to put Public Safety solutions on to others. If the future determines that integrated trunking and digital systems are what Public Safety must have, then Public Safety will find the way to get them. We do not believe, however, that the levels of sophistication that may be necessary in the future for Public Safety should be forced upon the general public. They should have available to them cost effective solutions to their problems. Because of these differences, we feel that placing Public Safety into a separate part in the rules would allow differing solutions to differing problems. For example, narrowband analog solutions for some private system users may be highly desirable whereas we believe they are entirely unsuited to what we need. We suggest that it is also in the Commission's interest to be able to address problems unique to one segment of the community without having to involve more than that one segment in the discussion. We certainly believe that it would help us by not having to respond to future purely commercial issues that do not apply to us.

Interoperability is not a buzz word, it is reality. More and more, as governmental budgets dictate, interagency and mutual aid compacts are derived. These arrangements happen between all levels of government, and communications leads the way in making cooperation

possible. We must have the ability to communicate with our neighbors. We also must see the generation of more clear frequencies for disaster response and mutual aid. Particularly in the 150-174 MHz band, we should see the production of nationwide clear channels for large incident management. These frequencies should be available to all governmental units.

Transition Period

Arizona advocates a step process to transition gracefully into new systems. Virtually none of our jurisdictions has current funding to accomplish significant changes in the immediate future. We need both time to plan where we will go plus we need to amortize the millions of dollars in equipment we presently have in service. We recognize, however, that we also need to temper the cost of these changes with the accommodation of new users and systems in the shortest time possible.

After the Report and Order

We suggest that the first step for Public Safety should be to require coordinators to require power levels and antenna patterns that will produce acceptable coverage of no more than the jurisdiction's service area from all new coordinations. These would include any request for a new system or site, for any change in frequency, and for any change in transmitter power out or effective radiated power. Public Safety requires a high percentage of coverage and consequently high signal levels. We suggest that a 39 dBu contour in VHF and a 41 dBu contour in UHF is appropriate. We suggest adopting a 95% coverage area using these levels. These levels are based upon base/mobile systems and not upon base/portable systems.

In metropolitan areas, systems can require much greater signal levels. Use of portable radios by police and fire personnel is almost universal. Signal penetration of large buildings and tunnels requires much more concentrated signal levels. In these cases the coordinator should be able to allow signal levels high enough to meet the need. The critical issue, however, is to assure that signal levels are rapidly decaying outside of the jurisdictions's boundaries.

In the past several years, computer programs have become available and affordable for generating estimates of coverage contours. All of APCO's local advisors now have this

ability, and numerous system users in Arizona have it as well. There are also commercial sources who can provide these estimates at a reasonable cost, and we feel requiring this level of pre-engineering for Public Safety applicants is not a burden. We recommend that these measures become a licensing requirement concurrently with the adoption of the report and order.

This would also be the time to start a national planning process for Public Safety frequencies below 800 MHz. We suggest APCO should again be the facilitator of this planning effort. We think this process should be completed in two years.

One Year After Report and Order

We suggest the second step should occur one year after adoption of the report and order. At that time, systems within 100 miles of urban areas 1-100 should be required to reduce their entire system deviation to 4 KHz. At this date, mileage restrictions for adjacent channel assignments should be removed as well. The low power restrictions should be retained on the 12.5 KHz channels between 450-460 MHz while the 12.5 KHz channels between 460-470 MHz should be allowed to go full power with an appropriate adjacent channel protection distance. Last, as of this date, trunking should be allowed on frequencies between 450 and 470 MHz where an exclusive use exists.

In Arizona, we do not see any immediate need to force many rural licensees to convert systems just for the sake of conversion. Arizona only has 15 counties in 113,909 square miles of land. We also have two metropolitan areas - Phoenix and Tucson. These two areas are separated from each other by about 90 miles. Roughly 75% of Arizona's population lives in these two areas. There are a great many rural systems which should be allowed to remain untouched until their presence becomes a problem in spectrum management. We agree with your proposed time of 2008 for these areas to change. We suggest, however, that with the Commission's approval, a future Regional Planning group could speed up that process if necessary.

The change to 4 KHz deviation should result in a limited number of additional system

licenses. We do not agree that a reduction to 3 KHz deviation is a workable solution. The manufacturers of our radio equipment are telling us that retrofit kits for receivers will not be widely available. The receiver conversion process for most of the equipment we presently own is much more complicated now than it was the last time such changes took place. Without the ability to recover more audio from narrower deviated signals, Public Safety systems would greatly suffer through decreased range, increased noise, decreased recovered audio in high noise environments, marginal or inoperative signalling systems, Continuous Tone Coded Squelch System problems and inoperative mobile data systems. Reducing transmitter deviation to 4 KHz should allow existing systems to continue to operate while getting rid of the adjacent channel mileage restrictions.

We advocate that the Commission should not place any 6.25 KHz channels in the 450-470 MHz band at this time. Instead, we suggest that the low power uses should remain on the 12.5 KHz channels that are between the high power channels in the 450-460 MHz band. High power channels should be allowed on the 12.5 KHz channels in the 460-470 MHz band. The reason for this differentiation is that there is fairly heavy use made of these 12.5 KHz spaced channels between 450-460 MHz and less use between channels in the 460-470 MHz band. We propose that all of these 12.5 KHz channels should be placed in the Public Safety generic category so that they are available for use irrespective of service. Also under our proposal, they would be coordinated by a single frequency coordinator. Until all systems would be required to be converted to true 12.5 KHz equipment (10 years after the Report and Order in our proposal) the 12.5 KHz located systems between existing 25 KHz systems would need to be site specific and coordinated to assure non-interference with existing systems.

Arizona feels that there will be increased usage of these 12.5 KHz frequencies in the 460-470 MHz band. In particular, we know there is interest in trunking 450-470 MHz frequencies, if we can get exclusivity and if individual licensees can get a few more channels to allow it. Trunking these frequencies will add efficiencies by itself. If VHF frequencies are released to Regional oversight as systems migrate to more efficient 450-470 MHz trunking

systems, we feel significant changes can be made both in the use of trunking and in the ability to use channels that would be released. Freedom to reuse these vacated frequencies should make migration into a planned realignment much easier.

One major difference that could prompt trunking at 450 MHz where it would not go to 800 MHz is the differing signal propagation of the two bands. Propagation studies done at both bands for the City of Mesa, Arizona, for example, indicate that a single 450 MHz site would adequately cover its 150 square miles where two or more sites would be needed at 800 MHz. The difference is because of building penetrations needed in heavy construction facilities that are 15 miles apart. In this case, trunking at 800 MHz would be much more costly and complex than it would be at 450 MHz. Mesa currently declines to trunk 800 MHz because of the costs involved. There is a good possibility they would switch to trunking if allowed to go to 450 MHz. Manufacturers are able to supply 450 MHz trunking equipment now if the spectrum issues could be dealt with.

Two Years After Report and Order

Arizona feels this would be the appropriate time to have a finished national plan and to start development of regional plans. Because of the large number of licensees on these frequencies, we do not expect there would be any apathy in the process. We expect that regional plans could be quickly developed that the Commission could accept.

Five Years After Report and Order

We think several additional things should happen at the five year point. First, only 12.5 KHz type accepted equipment should be available for sale for use on these systems. Second, existing equipment should be grandfathered for continued use. Third, all existing systems should be required to meet the contour requirements of no more 39 dBu at VHF and 41 dBu at UHF. Fourth, all existing VHF systems should also move onto 12.5 KHz channels with the exception of those which might receive a waiver recommendation from the Regional Review Committee. This last suggestion again is to not force moves for the sake of moving. If rural systems could remain where they are without hurting anyone, leave them alone.

We expect that requiring adherence to contours would either reduce effective radiated powers of most existing systems or cause the use of directed antenna patterns to cover service areas only. Either way, we expect that many additional systems could be added at closer spacings. Particularly where some very localized systems now use high mountaintop sites and where high mountain sites at the edge of a service area use omnidirectional antenna patterns these changes could have a significant effect on spectrum use.

Installing all VHF systems into a 12.5 KHz spaced plan would have the effect of freeing up the twenty (20) suggested trunking and the five (5) emergency channels. These channels would be realized out of those that were added by going to the closer spacing. At the same time, if the further use of all of the VHF frequencies were under Regional Review, then additional problems could be addressed. These problems include such things as specific mobile relay frequencies, which portions of the band should be used for control and mobile purposes, and which portions should be used at mountain sites. It is our feeling that these issues have to be addressed at the Regional level because of the differences from region to region, the complexity of the problems, and the overriding need to not lose track of existing users.

Ten Years After Report and Order

At the ten year point, we suggest that all systems should be fully compliant with 12.5 KHz channel spacings and have appropriate bandwidth equipment. We also like the Commission's proposal of rewarding users who got to that point early by awarding them additional channel space. Whether that channel space was used to add another 12.5 KHz channel, to divide it into subsections, or to stack it for a wideband 25 KHz use for advanced technologies should be up to the user with the recommendation of the Regional Committee and the Commission's approval.

We also think that this would be the appropriate time for the Commission to revisit any further narrow banding. If in essence, spectrum management were given to the Regions, then it would be up to them to cooperatively shift users around or to hold vacant spectrum as it became available to be able to position users and technology to its best advantage.

APCO's Project 25 is attempting to not only look at the next generation of equipment, but it is also attempting to define a forward and backward compatibility and migration process. We fully expect that in the near future the migration path is going to be well defined. We expect that it will be Project 25 goals oriented - digitally - in perhaps a 6.25 KHz bandwidth, but it might be something more or something less. Our position is that until we know what it is, we should not try to specify what spectrum it will fit in. The key to us is in putting enough flexibility and authority into Regional planning groups to allow them to react to it once it is here.

Trunking at VHF

Some commenters in docket 91-170 suggested that the end result of this refarming proceeding should try to make some substantive changes other than just to increase the number of frequencies available. Two such suggestions were to define specific mobile relay frequency pairs and to allow trunking. Arizona is absolutely against simply splitting frequencies and then allocating any newly derived frequencies for business as usual. We feel there must be some identified system efficiencies with new frequencies.

We suggest that the trunking technology that exists in the 450-470 MHz and 800 MHz bands is usable on the 150-174 MHz band at 12.5 KHz channel spacings. Since this technology already exists, the only thing we need to do to use it is to identify frequencies for it. Rather than to just say it should be done, we have taken this opportunity to actually show two ways that this could be done. These are attached as Appendices A, B, and C.

We are suggesting that twenty (20) VHF trunking channels could make a difference.