



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**

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February 3, 1993

Federal Communications Commission  
Office of the Secretary (FCC)  
Washington, DC 20554

Reference PR Docket No. 92-235

MAR 7 1993  
FCC

Dear Sir or Madame,

Please accept this response to reference docket:

Introduction:

The Department of Natural Resources protects 12.5 millions acres throughout Washington State from wildfire. Primarily during the summer and fall about half of the department's 1,200 employees are ready to go whenever they are needed to fight fires. Crews from 11 correctional facilities and about 500 seasoned fire fighters round out the DNR's forces.

Critical to fighting forest fires and other forestry conservation activities is radio communication. The department owns and operates an extensive wide area two-way conventional VHF (150 MHz) radio system that utilizes 11 radio networks consisting of 20 base stations, 65 mobile relays, four microwave links, four radio frequency links and 1,900 radios. This system is used state wide by the department and is also used extensively by the Department of Wildlife for enforcement with 400 radios, and by State Parks and Recreation with 500 radios.

During forest fires, the wide area radio system is supplemented with base stations in three mobile command centers, 4 tactical mobile relays and 200 radios operating on 14 radio channels. When the department radio resources are exhausted, additional radios from the Boise Interagency Fire Cache are added to the system. Also, there are numerous agreements with the US Forest Service, other federal agencies, city fire departments, county fire departments, rural fire districts, and commercial cooperatives to operate on the department's radio channels during forest fires. Generally, the radios from other agencies are programmed at the fire to operate on the department's licensed radio channels.

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We welcome new technology and spectrum efficiency to allow our radio system to meet the future needs of the radio users. However, we believe that the initiative should be modified to address wide area public safety radio systems such as that operated by the department. Refarming represents the largest single change in our radio system since the move from VHF low band to VHF high band 25 years ago. We'd like refarming to be a positive change where the department can migrate to new spectrum efficient technology in an orderly, economical and rational manner.

General Concerns:

The department's concern with the refarming initiative centers on :

- the potential for losing interoperability, a major threat to public safety,
- the proposal to reduce effective radiated power at high elevations and transmitter deviation in January of 1996,
- replacing the FCCA with a single Public Safety Coordinator, and
- not allowing a reasonable time to depreciate existing radio equipment.

Some federal agencies we work closely with are planning a change to narrow band digital equipment in three years. Unless they purchase equipment that is backward compatible, it will sever direct field radio communications between agencies. Long term, if standards from the FCC are not clearly established, it is not likely that radio communications with these agencies will be reestablished. Without firm standards, incompatible bandwidths, different protocols and a variety of modulation schemes may prevent future interoperability.

Specific Problems:

Based on the general concerns above, please accept the following specific responses to PR Docket 92-46:

Comment #1 - Reference page 414410, Introduction, Paragraph 2:

**Problem:**

The proposal indicates that the commission is sensitive to the need for a reasonable transition period for users to convert their radio systems to newer more spectrum efficient technology. We foresee a serious radio interference problem with the first transition due January 1, 1996.

Turning the deviation down on land mobile radio equipment to 3 KHz will reduce the transmitted bandwidth; however, the receivers will remain fixed at the current bandwidth. Unless the receivers are modified, they will not be protected from the on-rush of new adjacent channel activity. The interference from the adjacent channel will be critical to our public safety radio systems using existing equipment.

Also, four out of our seven Region Headquarters use remote base stations that operate through mobile relays at fixed locations up to 120 miles away. We believe that turning down the deviation to 3 KHz will add from 4 to 8 dB noise to these systems. Likely, some of the radio networks would have to be reconfigured at great expense if the initiative is not changed to include wide area radio systems.

**Recommendation:**

Eliminate the first transition and start in the year 2004 with a single transition. In the interim, new licensees would be able to use adjacent channels, provided they can gain approval of existing channel users.

Comment #2 - Reference page 414414, C - Radio Services, Paragraph 14 - Consolidation of PLMRSs:

**Problem:**

The department has been satisfied with the custom coordination service offered by the FCCA over the years. We are concerned that this service could be lost with other coordinators working with the same spectrum especially if they do not share a common data base.

The FCCA has been successful in handling disputes and interference problems among forestry conservation agencies. They sponsor annual training sessions for radio system design and management where various radio frequency coordination and potential radio interference problems are solved. We attribute their success and efficiency over the past 30 years to the fact that they are small enough to be manageable and specialized enough to be effective.

In addition, the FCCA coordinators are familiar with forestry conservation radio systems, issues affecting forestry conservation agencies and potential radio interference problems that go beyond the normal frequency application processing procedure. Also, the FCCA has an excellent response time on applications and typically offers a successful consultant service to applicants. It's not likely that this partnership between coordinator and applicant will continue unless forestry conservation radio remains a separate service or at least has the same guaranteed status in a public safety service.

**Recommendation:**

Maintain the FCCA as a coordinating radio service and assign the new channels from the FCCA block to this service. Work with the FCCA on problems with interservice sharing. Also, let the radio community know where the problems are with interservice sharing and enlist their support in solving the problems.

Comment #3 - Reference page 414415, C - Radio Services, Paragraph 17 - ... consolidation...:

**Problem:**

As an agency that has received excellent radio frequency coordination and cooperation from the existing FCCA channel allocation, we are concerned over the change to a Public Safety Coordination Service and channel pools.

With decreased State revenues and budget cutbacks likely we will not be in a position to completely change-out our radio system in biennial single fiscal period. This puts us at a big disadvantage competing for radio channels in a public safety pool and an even greater disadvantage in a general category pool. Our fear is that by the time we are able to secure funds for a system change the pool will be empty.

Second, leaving the FCCA to coordinate only the base channels would put them at the same "channel deprived" position they now experience. As we understand the refarming initiative, the department will have a one-shot chance at the next higher adjacent channels by implementing a system change starting before 2002, two years prior to the mandated second transition. However, we feel that offering the next highest channel as an incentive to change may not be the best technical choice. The adjacent channel would be a source of interference on the existing radio system. It would be best to simply return the incentive channels to the FCCA service to be coordinated on a more effective basis.

The initiative allocates new channels adjacent to some of our department channel for SMR use. Interspersing of SMR channels into our channels presents another problem. We use the same mountain top sites as the SMRs and many of these channels cannot be used at these sites without causing interference. It is difficult enough now to deal with adjacent channel users within public safety at the sites and with the mobiles in our coverage areas without adding a SMR interference potential to our receivers.

Finally, the proposal seems to favor SMRs by allowing them access to approximately one quarter of the public safety current allocation in the 150 -174 MHz band. We feel that the Department of Natural Resources will be disadvantaged in implementing new radio technology without access all the new channels resulting from the split. The department would like to have the option of providing full featured trunking, automatic vehicle locator, laptop communications, and other future needs on our state-wide radio networks. It is not likely that these services will be provided in a single package for the rural areas we work and on a reliable basis by the SMRs. The Department of Natural Resources needs to have radio communications during wildfires when typically business radio systems overload or are destroyed by fire.

**Recommendation:**

Assign all new channels derived from the existing forestry conservation allocation to the FCCA and require strict technical guidelines in their distribution. As an alternative, require a new Public Safety Service to have a Forestry Conservation Section with its own block of frequencies including all channels coming from the present allocation. Ensure that the Public Safety Service operates responsibly concerning forestry conservation channel coordination.

Comment #4 - Reference page 414417, D - Technical and Operational Rule Changes, Paragraph 20 - Adopt Reduced ERP and HAAT Limits:

**Problem:**

This proposed rule would impose unreasonable and unworkable restrictions on the department's radio system for no good reason. As indicated above, the department operates a radio system state-wide using base stations and mobile relays at mountain top peaks. The base stations and mobile relays operate with a power output of approximately 300 watts ERP. Using the above 590 feet reference in Table C-3 on page 414517, the ERP would have to be reduced to 5 watts under the proposal.

I estimate that the number of mobile relays and base stations would have to be tripled to cover the same area with the reduced power. This would cost the department over \$1,000,000 initially with \$300,000 per year recurring costs without a single spectrum benefit for anyone. In fact, additional frequencies would be required to link the additional base stations with existing communication consoles, reversing the effort to conserve the spectrum.

Also, simply turning down the power on existing equipment as proposed in 1996 will cause spurious emissions as a lot of the equipment is not designed to operate on low power.

**Recommendation:**

Recognize public safety radio systems in the West such as ours that operate with base stations and mobile relays on mountain tops and cover vast sparsely populated areas. Either use signal strength based on service area contours as suggested by many public safety agencies for cochannel and adjacent channel separation or exempt public safety agencies operating wide area radio systems on existing and new channels from ERP and HAAT limits.

Comment #5 - Reference page 414417, D - Technical and Operational Rule Changes, Paragraph 22 - Promotion of Interoperability:

**Problem:**

As indicated above, interoperability is extremely important to the department. In recent years, with existing wideband programmable radios, interoperability has reached an all time high. The result is an improved multi-agency initial public safety response, sharing of specialists and expensive forest fire fighting equipment, and improved coordination on-scene.

Interoperability is part of our plans and we would be seriously impacted if interoperability were not included in setting standards for new technology. The commission needs to go much further than eventually proposing mutual aid channels as indicated in the initiative. For obvious reasons, we need to communicate by radio at public safety incidents with other agencies across-the-board as part of the radio system rather than at arms length over mutual aid channels.

Unlike the three protocols situation that now exists with 800 Mhz trunking, the 150-174 MHz public safety band has radios that are completely clonable among system. Designating mutual aid channels to provide interoperability among protocols as was done with the 800 MHz National Public Safety Planning and Advisory Committee (NPSPAC) would be only a partial solution for public safety high band radio users. For example, at project fires, radios from other agencies report to the fire and we reprogrammed their radios to operate on our channels allowing complete integrated radio communications. Using radios operating on different protocols and operating on conventional mutual aid channels would limit the use of other agency radios at forest fires.

The thought of cooperative agencies operating with incompatible equipment while manufacturers compete with exclusive protocols for market share is simply unacceptable.

**Recommendation:**

Adopt APCO 25 as the public safety standard and add to it, if necessary, to ensure compatibility between radios and forestry conservation public safety radio systems. In short, require that all public safety agencies including federal, state and local remain compatible in the new digital narrow band technology.

Comment #6 - Reference page 414417, D -Technical and Operational Rule Changes, Paragraph 23, Designation of Channels ... Shared Use:

**Problem:**

Using a lottery system to distribute innovative shared use channels would leave allocation of the spectrum to chance rather than using a logical and reasoned allocation scheme. As a public safety agency that relies heavily on land mobile radio communications, we take exception to this approach. While this may be a common practice in the business community where various companies and fixed assets are merged, distributed, bought and sold, and put to use on an opportunity basis we believe some other more serious method should be used when dealing with public safety.

Considering the experience with 220 MHz lottery where the commission was flooded with applications for channels by speculators for profit, we believe that it would not be advisable to allow the same to happen with this initiative. Also, we believe that business and public safety will have different migration strategies and should not operate out of a common channel pool.

**Recommendation:**

Distribute the VHF channels on an innovative need basis taking into consideration that the channels will be more effective when used in rural areas where penetration of foliage and trees is important. In short, make VHF high and low band a rural centered bank of frequencies and offer incentives to encourage urban and suburban areas to use the higher frequency channels (400 MHz and 800 MHz).

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Comment #7 - Reference page 414418, E - Miscellaneous Proposals, Paragraph 24 -  
Modification of Existing Systems:

**Problem:**

As indicated in comment #1, reducing deviation to 3 KHz does nothing for receivers that will still have a full channel bandwidth. As a result, opening adjacent channel coordination without limitation in 1996 would cause interference problems. Also, as in comment #4, ERP and HAAT limits would require the department to triple the number of mobile relays and base stations to retain existing coverage. Both of these functions represent a major impact on our radio systems.

Also, reducing the deviation in transmitters will result in technical problems using existing equipment. Volume will have to be turned up in receivers causing some added noise and distortion in the audio. The added noise especially in fringe areas will make communications impossible. This is a double problem for the department since we go through two transmitters and receiver on our State and Area mobile relay radio networks. Additionally, the modulation ratio of audio to CTCSS will be reduced ultimately resulting in reduced radio range.

**Recommendation:**

Implement a one step transition in the year starting 2004 and recognize the need to exempt wide area radio systems from ERP and HAAT limits. Finally, encourage use of VHF low band and high band in rural areas where they function the best over long distances. Use the higher frequencies in the cities.

We'd like to sincerely thank you in advance for taking the time to consider these concerns. If you have any questions regarding our agency's input, please call me at (206) 459-6710.

Sincerely,



James H. Kelly  
Radio Systems Manager  
Information Management Division