

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
The Development of Operational, Technical, and)
Spectrum Requirements for Meeting Federal, State) WT Docket No. 96-86
and Local Public Safety Agency Communications)
Requirements Through the Year 2010)

To: The Commission

**COMMENTS OF THE
PUBLIC SAFETY NATIONAL COORDINATION COMMITTEE
IN RESPONSE TO FOURTH NOTICE OF PROPOSED RULEMAKING**

Kathleen Wallman, Chair
September 25, 2000

SUMMARY

The Public Safety National Coordination Committee (NCC) urges the Commission to adopt the NCC's recommendations as soon as possible. In particular, the Commission must act quickly to finalize its adoption of the narrowband digital standards for the Interoperability channels. Public safety users cannot implement systems in the 700 MHz band until radio equipment is available and manufacturers cannot proceed with equipment development until such time as the Commission finalizes the interoperability standards.

The NCC supports the adoption of a "migration path" to spectrum-efficient 6.25 kHz technology for voice communication. However, the principal focus of that migration to 6.25 kHz should be on the General Use channels, not the Interoperability channels, which must continue to operate with the Project 25 Phase I (12.5 kHz) standard for the foreseeable future. A common baseline standard on Interoperability channels is essential to ensure that users of otherwise incompatible 6.25 kHz technologies retain interoperability with each other, and with early users of 700 MHz, for whom 12.5 kHz equipment will be the only near-term option.

The NCC does not believe that the Commission should attempt to push data operations into narrower channels. Spectrum efficiency for data is more likely to arise from higher data rates in wider, not narrower, channels.

The NCC also proposes the adoption of a modified band plan for the Interoperability channels, which will provide added interference protection and greater flexibility for public safety users. The NCC also reiterates its call for subscriber equipment licensing, and mandatory memoranda of understanding between applicants and the

relevant Regional Planning Committee (RPC) or State Interoperability Executive Committee (SIEC). These provisions are necessary to ensure that all users of the 700 MHz public safety band will comply with procedures intended to ensure interoperability between all emergency responders. Similarly, the Commission should adopt display labeling requirements so that all responders have common nomenclature when designating and using the Interoperability channels.

The NCC again urges the Commission to mandate priority access procedures for the Interoperability channels to facilitate nationwide standards for the increasingly common emergencies that require shared response by agencies from widely scattered jurisdictions. However, it is neither necessary nor desirable to conform the NCC's proposed priority scheme with the Priority Access Service scheme adopted for commercial mobile radio services.

The NCC supports the use of receiver standards, and is moving forward in its efforts to help define aspects of those standards. If receiver standards are adopted, equipment labeling as suggested by the Commission will be unnecessary.

Finally, the NCC reiterates that the Commission must require RPCs to use a single "pre-coordination" database. Individual regions cannot be allowed to act independently without careful planning with all adjoining regions, which can only be accomplished with a common database. Any other approach will result in inefficient spectrum utilization, harmful interference, and inevitable disputes between RPCs, applicants and frequency coordinators – disputes which would have to be resolved by the Commission.

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The Public Safety National Coordination Committee (“NCC”) hereby submits the following comments in response to the Commission’s Fourth Notice of Proposed Rulemaking, FCC 00-271, released August 2, 2000, (“Fourth NPRM”), in the above-captioned proceeding, which seeks comments on the NCC’s “Recommendations to Federal Communications Commission for Technical and Operational Standards for Use of the 764-776 MHz and 794-806 MHz Public Safety Pending development of Final Rules,” dated February 25, 2000 (“NCC Report”).

The NCC responds herein to some of the questions raised by Commission concerning the NCC Report, but does not otherwise repeat the recommendations in the NCC Report, all of which continue to have the support of the NCC. These Comments are based on the extensive work of the NCC Steering Committee, Interoperability Subcommittee, Technology Subcommittee, and Implementation Subcommittee, prior to and during open meetings of the NCC held in Washington, D.C. on September 14 and 15,

2000. The views expressed herein reflect the clear consensus of the NCC, but do not necessarily represent the views of each individual or entity participating in the NCC process. The following categories follow the order in which the topics were presented in the NPRM; no precedence of recommended action should be inferred.

Band Plan and Guard Channel Issues

At its meeting on June 2, the NCC approved a revised 700 MHz Band Plan, which it is hereby submitting for Commission consideration. A copy of the plan is attached hereto. In the Commission's original plan, the sets of interoperability channels were too close in frequency to permit channels to be combined into a single antenna using "off the shelf" frequency combiners. Absent the modified plan, the interoperability channel groups could be operated from a single site only by using expensive custom - higher loss - frequency combiners or multiple antennas, again at additional cost and with the potential for cross-channel interference to nearby subscriber units. The modified frequency plan is designed to permit users to transmit multiple sets of interoperability channels more efficiently and economically; it greatly minimizes the potential for interference between interoperability channels being used in either simplex or mobile relay mode in the same location. The revised Band Plan also addresses some of the Guard channel issues raised by the Commission in paragraphs 14-18 of the Fourth NPRM.

The NCC's revised band plan assigns four contiguous 6.25 kHz channels to each interoperability "channel." The center channel set of each allocation constitutes the 12.5 kHz interoperability channel. The Commission must change the designation of the next-adjacent 6.25 kHz channels on either side of these center channel sets to

“Interoperability/Interoperability Guard” channels. When these channels are aggregated with the center channel set to form a 25 kHz trunked channel, the entire 4-channel block becomes an Interoperability Channel. When not aggregated, the two 6.25 kHz adjacent channels become Interoperability Guard channels.

In Paragraph 13 of the Fourth NPRM, the Commission supported the NCC’s request to designate 10 Interoperability channels for secondary trunking. The 25 kHz trunked Interoperability Channels described above support this concept. The NCC reminds the Commission however, that the Regional Planning Committees play an important role in assigning the next-adjacent 6.25 kHz channels on either side of the 25 kHz trunked Interoperability Channel to ensure that coupled power does not cause harmful interference between the 25 kHz trunked Interoperability Channels and the adjacent channel users.

When not aggregated (*i.e.*, 12.5 kHz Interoperability Channels), the two 6.25 kHz adjacent Interoperability Guard channels provide protection against interference from adjacent channel users in the next adjacent 6.25 kHz assignments on either side of the 12.5 kHz Interoperability Channel, allowing full use of the 12.5 kHz Interoperability Channels throughout the United States with negligible potential for harmful interference from the adjacent channels.

Finally, the NCC recommends that the Commission consider permitting these 6.25 kHz Interoperability Guard channels to be used for low power secondary on-scene interoperability communications at such time as 6.25 kHz subscriber equipment becomes available.

Subscriber Equipment Licensing Issues

The Commission indicates in the Fourth NPRM that it does not believe that there is an adequate record in this proceeding to support the NCC's recommendation that the FCC license subscriber equipment (mobiles and portables). The NCC continues to be concerned with the potential for disruption to interoperability plans caused by mobile and portable units operating on Interoperability channels without the knowledge and consent of the relevant Regional Planning Committee (RPC) or State Interoperability Executive Committee (SIEC). Unfortunately, abuses of this nature are difficult to document as they are generally received and addressed in verbal fashion without a written record. The NCC believes, however, that some of the 800 MHz Regional Planning Committees may be able to provide further information on these matters.

Memoranda of Understanding and Sharing Arrangements

The Commission seeks further comment and explanation regarding the NCC recommendation that applicants be required to sign a Memorandum of Understanding (MOU) with the relevant RPC or SIEC to ensure consistent and proper use of the Interoperability channels. The NCC Report included a model MOU for use by the RPCs and SIECs.

The NCC continues to believe that the use of a MOU is critical to the management of the Interoperability spectrum. Experience with existing interoperability channels in other bands suggests that an MOU is necessary to ensure that channels are in fact operated consistent with Regional Plans and do not compromise interoperability

procedures. Because of the inherent “mutual” and “shared” nature of Interoperability channels, all users must abide by certain operating standards. Otherwise, there is a risk that channels will eventually become useless for interoperability purposes. A MOU, such as the model set forth in the NCC Report, would provide RPCs and SEICs with an important tool to police Interoperability channel use and, if necessary, discipline abusers. However, that tool will be of little value unless signing a MOU becomes a requirement for applicants.

The NCC does not suggest that the Commission endorse its model or any other specific MOU language, as the necessary terms and conditions of the MOU may well vary from region to region. However, the Commission should require that some form of MOU be used.

Display Labeling (Nomenclature)

The NCC Report recommends that a type-accepted radio be required to include Interoperability channel labels alphanumerically if the radio is equipped with an alphanumeric display. The Commission seeks comments on this proposal and, in particular, asks whether the alphanumeric channel labeling requested by the NCC would be implemented even if not required by rule. The NCC believes that standardized alphanumeric labeling of conventional interoperability channels is essential, and will only occur in a consistent manner nationwide if it is mandated by the FCC. Absent such a requirement, there is a danger that users and vendors will adopt their own nomenclature, undermining real-time interoperability in the field. As with many of the NCC’s other recommendations, a national requirement is important to ensure uniform procedures for

interoperability between responders located in different Regions. This would occur along border areas (which include some major metropolitan areas) or when major emergencies such as forest fires draw emergency responders from across the nation.

The NCC suggests that this labeling requirement should only apply to radios that include an alphanumeric display of eight (8) or more characters. During the NCC deliberations, a number of manufacturers were surveyed regarding the alphanumeric display characteristics of their potential subscriber units for this band. It appeared that eight (8) characters was the minimum that would be provided if a unit was equipped at all with an alphanumeric display. The NCC does not suggest that manufacturers be required to provide alphanumeric displays, or that such displays have eight or more characters. However, the channel labels selected by the NCC were based upon an 8 character display.

The proposed alphanumeric channel labeling requirement addresses only conventional channel assignments. Trunked operations have talkgroups that are irrespective of conventional channel labels, and the parameters reflected in the previous question include a number of other similar parameters specific to each trunked system. Labeling of trunked talkgroups thus must be a function of the administrators of the individual trunked systems.

Beyond the channel label itself, there are additional parameters required to completely define operation on each of the interoperability channels. Since digital systems are required in the 700 MHz band, these parameters are more complex than were those for the 800 MHz NPSPAC channels, where it was only necessary to designate interoperability frequencies and a nationwide subaudible squelch tone. In the 700 MHz

band, conventional channel labeling requirements must include a number of technical parameters that are dependent upon the digital interoperability standard adopted by the Commission. For example, for Project 25, Phase I, which tentatively has been accepted by the Commission, these parameters include System ID, Network Access Code, and Talkgroup ID. The System ID, Network Access Code and Talkgroup ID should be the same for all 700 MHz Interoperability Channels. The NCC will identify these additional parameters and appropriate values for each in a subsequent recommendation once the interoperability standard has been adopted by the Commission.

Priority Access

The NCC Report recommended mandatory adoption of a priority access scheme for Interoperability channels. The Commission indicates in the Fourth NPRM that it finds “merit” in the priority scheme, but is reluctant to codify the scheme within its rules. The NCC continues to believe, however, that a common nationwide priority scheme is necessary for interoperability. For example, the recent wildfires in Montana and other western states required thousands of military and civilian firefighting resources from throughout the United States. Interoperability among those personnel in the field (in this case, the extraordinarily dangerous “field” of fire lines and “hot spots”) requires not only common radio equipment, but also common procedures and practices, including priority use. The only solution that guarantees that all participants in an event are following common procedures with respect to channel access priority is to codify this access into the Commission’s rules using the priority definitions recommended by the NCC. The nation’s public safety personnel cannot rely upon a conglomeration of 50 states and/or 50+ RPCs to unanimously adopt these same priorities in their plans.

The Commission also notes that the NCC's recommended priority levels are different from those adopted for commercial mobile radio services (CMRS), and seeks comments as to whether the priority schemes should be more complementary. As the Commission notes in the Fourth NPRM, at ¶38, the Priority Access Service (PAS) priorities developed for CMRS are primarily intended to address administrative priorities in terms of the nature of the user, whereas priorities proposed by the NCC for the interoperability channels are intended to address operational priorities in terms of the type of emergency. That is a critical distinction which reflects the basic differences between CMRS and public safety radio system operation. For example, if the PAS priorities were applied to the Interoperability channels, the President and other top executives conducting routine business could be given priority over the firefighters, police officers, and other personnel directly responding to a life-threatening emergency. PAS has its place in the CMRS environment. However, it is incompatible with the operational priority requirements of local/state public safety services that will be using the 700 MHz band and whose priorities must be based on communications needs at the scene of an incident.

Calling Channels

The Commission agrees with the NCC recommendation that it designate nationwide calling channels for the Interoperability channels. Fourth NPRM, at ¶40. However, the Commission inquires as to whether it should also adopt monitoring or coverage requirements for the designated channels. The NCC believes that both monitoring and coverage requirements are necessary, but notes that both are dependent

upon local/state variables that include system design and cost. The NPSPAC Calling Channel has been implemented successfully across the country, primarily based upon coverage and monitoring requirements, and the NCC believes that consistency dictates the same approach for the 700 MHz band.

The calling channels are of no use unless they are monitored by an appropriate dispatch center(s). Coverage for calling channels should be at least as reliable as the non-Interoperability system implemented by the same agency(ies). It is the NCC's recommendation that base station applicants be required to submit calling channel signal coverage and monitoring plans to the RPCs and/or SIECs as part of the Regional/State Planning process prior to licensing the calling channels. The RPCs and or SIECs should be responsible for coordinating calling channel implementation to meet local/state needs.

Narrowband Digital Voice Standards for Interoperability Channels

The NCC continues to support the adoption of the Project 25 Phase I standards for the 700 MHz interoperability channels. The Commission "tentatively" concluded in the Fourth NPRM that it should adopt the NCC recommendation for Project 25 Phase I standard, but that it should also develop and implement a "migration path" to 6.25 kHz, since Project 25 Phase I is a 12.5 kHz technology. For the reasons discussed below and in the NCC Report, the NCC believes that operations on the Interoperability channels must remain at 12.5 kHz using the Phase I standard for the foreseeable future. The NCC shares the Commission's goal of moving voice channels towards more efficient 6.25 kHz operation in the 700 MHz band, but believes that such a migration should first occur in the General Use channels, where channel capacity and efficiency are a greater concern.

In contrast, the Interoperability channels must provide a “digital baseline common denominator” to ensure interoperability with *all* 700 MHz public safety radios.

During its deliberations on the selection of an interoperability standard for voice operations, the NCC found itself constrained by the need to maximize marketplace competition while considering four candidate technologies (Project 25 Phase I, Project 25 Phase II, 4-slot TDMA TETRA, and 2-slot TDMA). Selection of any one of these candidate technologies for the interoperability standard would have an impact on the marketability of the other three and, in some cases, would preclude one or more of the alternate technologies from achieving a viable market.

After lengthy discussion, the various manufacturers promoting the four alternatives all agreed that Project 25 Phase I offered a mode of operation that could be integrated into radios operating in any of the four candidate modes. Even though this would mean that radios designed to operate, for example, in the 4-slot TDMA TETRA mode would have to include Project 25 Phase I as a second mode of operation, the manufacturers were in agreement that this would not place an undue burden on the marketability of such radios. On the other hand, the manufacturers were in agreement that should either Project 25 Phase II, 4-slot TDMA TETRA, or 2-slot TDMA be chosen as the recommended standard for voice interoperability, then the marketability of radios utilizing the “un-selected” technology would be severely limited by the complexities of integrating the “selected” technology into those radios as a second mode of operation. Thus, the recommendation of Project 25 Phase I as the interoperability mode was the only recommendation that could maximize marketplace competition.

In making this recommendation, the NCC was fully aware that it did not satisfy the Commission's desire for "one-voice-channel-per-6.25 kHz-of-bandwidth". The recommendation did, however, comply with the Commission's channel efficiency requirements (*i.e.* 4.8 kbps channel rate per 6.25 kHz of bandwidth). If "migration to 6.25 kHz technology" is meant to require "one voice per 6.25 kHz of bandwidth", then the answer lies in the future development of technology. What technological advancements lie in the future that would improve the marketability of dual-mode radios (*e.g.*, radios containing both Project 25 Phase II and 4-slot TDMA TETRA)? Is there some other mode of operation that would satisfy this "one-voice-per-6.25 kHz" requirement and be compatible with all of the known candidate technologies? Have marketplace forces narrowed the field of possible technologies to make the selection of an interoperability standard more evident? The NCC does not have the answers to these questions.

Therefore, the NCC recommends that the Commission allow land-mobile digital technologies to mature to the point that "one-voice-per-6.25 kHz" performance is widely available on the General Use channels before considering the possible selection of a "one-voice-per-6.25 kHz" standard for operations on the interoperability channels. The NCC further recommends that the Commission evaluate the status of technological development in the 700 MHz band in approximately 6 years (perhaps co-incident with the potential ending of the DTV transition period on December 31, 2006) to determine if such development has reached a point that selection of an appropriate "one-voice-per-6.25 kHz" technology is achievable as an interoperability standard. Should a decision be made at that (or a later) time to designate something other than Project 25 Phase I as the

“new standard” for operations on the interoperability channels, then an appropriate transition period to allow the orderly replacement/upgrade of then-existing radios also would need to be defined.

Data Interoperability Channels

The Commission also “tentatively supports” the NCC’s narrowband data transmission standards, but again seeks comment regarding the need to maintain 12.5 kHz channel bandwidths. The trend in data communications is toward higher data rates and this implies a movement toward wider, not narrower channel widths. The data interoperability standard which has been recommended (Project 25, Phase I) already complies with the Commission requirement for 4.8 kbps channel rate per 6.25 kHz of bandwidth, thus there is no need for a “migration plan to 6.25 kHz technology” for the data channels. While it may become possible in the future to attain a 9.6 kbps channel rate within a 6.25 kHz bandwidth channel, the more likely movement will be toward higher channel bit rates within the 12.5 kHz (or wider) bandwidths to improve data throughput. The primary requirement for data transmission from an operational viewpoint is “speed of transmittal” (*i.e.*, how quickly can a fixed amount of data be transmitted) which translates into higher data rates not narrower bandwidths.

Encryption

In response to the Commission’ inquiry regarding encryption, the NCC is pleased to note that on September 15, 2000, it adopted DES operating in the output feedback mode as the encryption standard. This mode is described in TIA/EIA IS 102.AAAA-A

PROJECT 25 DES ENCRYPTION PROTOCOL, which has been balloted as an ANSI standard and is awaiting publication. When published, the document will be re-numbered as ANSI/TIA/EIA 102.AAAA-A.

Receiver Standards and Interference

The NCC believes that receiver standards will become increasingly important in efforts to minimize the potential for harmful interference to public safety radio systems and actively is working with the TIA TR-8 committee to develop appropriate receiver performance standards. At its September 2000 meeting, the NCC Technology Subcommittee recommended that the Commission adopt a receiver performance standard and that a minimal level of performance (including interference susceptibility) be defined for all receivers.

In the Fourth NPRM, the Commission inquires as to whether it should also require equipment manufacturers to label equipment to indicate the interference level that a customer might expect with a given receiver. However, assuming that the Commission adopts receiver performance standards to which equipment must comply for equipment authorization, labeling of radios to indicate their interference susceptibility will provide little additional benefit. Furthermore, labeling on the radio itself is not evident to the user until after purchase. To be of much value, the interference susceptibility of a radio needs to be included amongst the information provided on product specification sheets and other similar sales literature. This will allow a purchaser to evaluate performance prior to making a purchase decision.

Pre-Coordination Database

The Commission has asked for comments regarding the use of the pre-coordination database for the assignment of the interoperability channels. The NCC believes that RPCs must be required by the Commission to use this standard database. Regions cannot operate in a vacuum. Each regional plan impacts many other regional plans from nearby states. Therefore, every region, and each of the four separate coordinators, must be working from a common database. Any other approach will lead to incomplete, inconsistent, and inefficient frequency assignments, with inevitable disputes arising between regions, coordinators, applicants, and the Commission.

The NCC wishes to make clear that the pre-coordination database actually pertains to the entire assignment and application process, and is not unique to the interoperability channels. It is, in fact, much more important for the General Use channels. The regional plans will have the option of pre-assigning channels to entities based upon an agreed upon criteria or assigning channels on a first come first serve basis. In either case, however, the regions and the frequency coordinators will need a repository for this information. Once these channels are pre-assigned or allotted a mechanism must be in place to manage the application process. Each region will have its own unique requirements based on technology and geography. However, they cannot perform the required management in isolation. The radio spectrum simply does not honor political boundaries.

The Commission obviously does not want to micromanage the spectrum or the regional planning process. However, unless RPCs operate from “the same sheet of

music” the Commission will in fact be forced to micromanage in order to resolve disputes between the many diverse interests involved.

CONCLUSION

The NCC urges the Commission to move as quickly as possible to finalize rules for the 700 MHz public safety band consistent with the NCC’s recommendations.

Respectfully submitted,

**PUBLIC SAFETY NATIONAL
COORDINATION COMMITTEE**

By:
Kathleen Wallman, Chair

September 25, 2000

Attachment 1 – Proposed Band Plan
(SEE NEXT FILE IN MICROSOFT EXCEL “BAND PLAN”)