PUBLIC SAFETY NATIONAL COORDINATION COMMITTEE

RECOMMENDATIONS TO
THE FEDERAL COMMUNICATIONS COMMISSION
FOR TECHNICAL AND OPERATIONAL STANDARDS FOR USE
OF THE 764-776 MHz AND 794-806 MHz PUBLIC SAFETY
BAND PENDING DEVELOPMENT OF FINAL RULES

Kathleen Wallman, Chair
February 25, 2000

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Public Safety National Coordination Committee Recommendations to the Federal Communications Commission for Technical and Operational Standards for Use of the 764-776 MHz and 794-806 MHz Public Safety Band Pending Development of Final Rules

I. INTRODUCTION

1. This document contains recommendations to the Federal Communications Commission from the Public Safety National Coordination Committee (NCC) for standards that will allow the public safety community to use interoperability frequencies in the new 700 MHz public safety band while final rules for that band are being developed. The recommendations are the product of an open and collegial effort by the members of the NCC subcommittees and working groups and have been reviewed and approved by the NCC Steering Committee and the NCC chair.

2. The NCC's basic recommendations are contained in the subcommittee and working group reports contained in the appendices. This covering document gives background and context to the basic recommendations; it is intended to supplement, not supplant, the reports of the subcommittees and working groups.

3. The Steering Committee believes that the recommendations contained herein strike the proper balance between obtaining timely deployment of 700 MHz public safety equipment at reasonable cost and using the interoperability channels in the 700 MHz public safety spectrum in a responsible, spectrum efficient manner.

II. BACKGROUND

4. In the 1997 Budget Act, Congress directed the Commission to reallocate, for public safety purposes, 24 megahertz of the spectrum recovered from TV channels 60-69 as a result of DTV implementation.[1] Shortly thereafter, the Commission initiated a rulemaking proceeding in ET Docket No. 97-157 which led to the adoption of a Report and Order reallocating 24 megahertz of spectrum located in the 700 MHz band for public safety services.[2] This new allocation was the largest ever made for public safety communications and constitutes a significant public benefit derived from the conversion of television broadcasting in the United States from analog technology to state-of-the-art digital technology.[3]

5. A portion of this newly allocated spectrum is dedicated to "interoperable" communications. The term, "interoperability" as defined by the Commission means:

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[1] 1997 Budget Act, *codified at* 47 U.S.C. § 337.

[2] Reallocation of Television Channels 60-69, the 746-806 MHz Band, ET Docket No. 97-157, *Notice of Proposed Rule Making*, 12 FCC Rcd 14,141 (1997); *Reallocation Report and Order*, 12 FCC Rcd 22,953 (1998).

[3] *See DTV Sixth Report and Order*, 12 FCC Rcd at 14,588.

> An essential communications link within public safety and private wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results.[4]

6. The Commission has stated that its primary goal with respect to interoperability is seamless interoperability on a nationwide basis.[5] It also determined that formation of a national committee to advise the Commission on the optimum use of the interoperability spectrum was the best mechanism for implementing nationwide seamless interoperability. It therefore decided to charter the Public Safety National Coordination Committee pursuant to the Federal Advisory Committee Act[6] and assigned it the following major responsibilities:

- Formulate and submit for Commission review and approval an operational plan to achieve national interoperability that includes a shared or priority system among users of the interoperability spectrum for both day-to-day and emergency operations and, in this connection, recommendations regarding Federal users' access to the interoperability spectrum.

- Recommend an interoperability digital modulation standard to the Commission, consider the benefits of employing trunking and make a timely recommendation as to whether the Commission should require trunking on all or a portion of the nationwide interoperability spectrum, and recommend the scope of parameters (e.g., sensitivity, selectivity, dynamic range, durability characteristics) that need to be included in receiver standards.

- Offer voluntary assistance in the development of coordinated regional plans.

- Provide recommendations on other technical matters that are common to the public safety community generally.[7]

7. The NCC was chartered by the Federal Communications Commission as a Federal Advisory Committee effective February 25, 1999. The Department of Justice, the National Telecommunications and Information Agency, the Treasury Department, the Federal Emergency Management Agency and the Federal Communications

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[4] The Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, Establishment of Rules and Requirements for Priority Access Service, WT Docket No. 96-86, *First Report and Order and Third Notice of Proposed Rulemaking*, FCC 98-191 (September 29, 1998) at ¶ 76. (First Report and Order).

[5] *Id.* at ¶ 90.

[6] 5 U.S.C. App. 2.

[7] *See First Report and Order* at ¶¶ 92, 116, 121.

Commission are co-sponsors of the NCC. The Charter charged the NCC with several responsibilities; including the following which are relevant to the instant document:

- recommend to the Commission as soon as practicable, but in any event no later than one year of the date of filing this charter, whether the Commission should take action to require trunking on all or a portion of the nationwide interoperability spectrum;

- within one year of the date of filing this charter, formulate and submit for Commission review and approval a set of recommendations for the use of interoperability spectrum, including recommendations for Federal Government users, that will allow public safety licensees to make use of such spectrum until final rules are developed.[8]

8. Kathleen Wallman was appointed Chair of the NCC by the Commission's Chairman and, in turn, appointed an 11 member Steering Committee made up of the following representatives of government, the public safety community and the communications equipment manufacturing industry:

Mayor Clarence Harmon	U.S. Conference of Mayors
Julio ("Rick") Murphy	Federal Law Enforcement Wireless Users Group
Marilyn Ward	National Public Safety Telecommunications Council
Steven Proctor	Public Safety Wireless Network
Ernest Hofmeister	Com-Net Ericsson Critical Radio Systems, Inc.
Harlin R. McEwen	International Association of Chiefs of Police
Douglas M. Aiken	International Association of Fire Chiefs
Ellen O'Hara	Motorola, Inc.
Louise Renne, Esq.	Local and State Government Advisory Committee
Governor James B. Hunt, Jr.	National Governors Association
Timothy Loewenstein	National Association of Counties

9. The Steering Committee sets NCC policy and has developed and adopted governance rules for the NCC. With the concurrence of the Steering Committee, Ms.

[8] *See* Appendix A, *NCC Charter* at 2.

Wallman established three NCC subcommittees: the Interoperability Subcommittee, the Technology Subcommittee and the Implementation Subcommittee and developed a statement of work for each. Michael Wilhelm, a senior Commission staff attorney from the Public Safety and Private Wireless Division serves as Designated Federal Officer (DFO) for the NCC, pursuant to FACA,[9] to ensure compliance with the statute, to serve at each NCC meeting, to assume certain administrative duties and to perform as liaison between the Commission and the NCC.

10. The NCC held its first meeting – an organizational meeting – on April 29, 1999. Since then, there have been five additional meetings held in Washington, DC, Lansing Michigan, New York City and San Francisco, California.[10] A substantial portion of each meeting to date was devoted to discussions of: (a) the trunking issue; (b) a plan to achieve national interoperability that includes a shared or priority system among users of the interoperability spectrum for both day-to-day and emergency operations and recommendations for use of the interoperability spectrum until final rules are developed. Typically, two of the NCC subcommittees meet the day prior to the general membership meeting; the third subcommittee meets during the morning of the following day and the NCC general membership meeting is held that afternoon. All meetings are open to the public and public participation is encouraged. The audio portion of meetings at the FCC headquarters is made available on the Internet. Meetings at FCC headquarters are televised in the meeting room with real time captioning for the hearing impaired; general membership meetings also are videotaped.

11. There is a substantial exchange of information among the NCC members, subcommittee members, working groups and Steering Committee members outside of the NCC meetings. Participants use "listservers," a form of group e-mail whereby any given e-mail message is transmitted to all individuals who have subscribed to the list. There is also substantial use of telephone conference bridges by the Steering Committee and the subcommittees.[11] Additionally, NCC subcommittee and Steering Committee members communicate frequently by telephone and conventional e-mail and by informal in-person gatherings.

III. TRUNKING

12. In the *Second Notice*[12] in the 700 MHz public safety spectrum proceeding, the Commission tentatively concluded that trunking of interoperability channels was essential for an adequate response to large scale emergencies.[13] Many of the

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[9] *See* 5 U.S.C. App. 2 § 10(e).

[10] The minutes of each meeting are contained in Appendix B.

[11] A conference bridge is essentially a conference call among a relatively large number or persons, *e.g.* 15-20 individuals.

[12] Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010; Establishment of Rules and Requirements of Priority Access Service, WT Docket No. 96-86, *Second Notice of Proposed Rule Making*, 12 FCC Rcd 17,706 (1997) (Second Notice).

[13] *Id.* at 17,752.

comments submitted in response to the *Second Notice* vigorously suggested otherwise, claiming that trunked operation was inconsistent with the operational necessities associated with interoperable emergency communications.[14] Accordingly, the Commission referred the question to the NCC, directing it to consider the benefits, or not, of employing trunking on interoperability channels and to make a timely recommendation on whether or not the Commission should require trunking on these channels.[15] The Commission's charge to the NCC in that regard was embodied in the NCC Charter, requiring the NCC to make its trunking recommendation by the one-year anniversary of its Charter – February 25, 2000.[16]

13. In a multiple channel radio system, centralized trunking is achieved by using multiple channel pairs controlled by a computer that automatically assigns a user the first available channel or places the user in a queue to be served in turn.[17] Both the base station and the associated portable and mobile units must be equipped for trunked operation. Trunking equipment is more technically complex than the equipment used for simpler repeater systems. Various manufacturers of land mobile radio equipment use differing "trunking protocols;" hence a subscriber unit[18] designed for use with a given trunked radio system will not work with a system employing a different trunking protocol.

14. Because trunked systems require fewer channels to serve a given number of users, they conserve spectrum. And, even considering that discrete items of trunking equipment are more expensive, economies can be realized in trunked systems because fewer base station receivers and transmitters are required to serve a given number of users. Trunking is currently used in many public safety radio systems; it is also widely used in commercial systems. Because of the spectrum efficiency inherent in trunking, the Commission requires 700 MHz public safety systems to employ trunking if the systems employ six or more narrowband channels.[19] However, an exception is made for systems using the designated nationwide interoperability channels.[20]

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[14] *See First Report and Order* at ¶ 115.

[15] *Id.* at ¶ 116.

[16] *See* Appendix A, *NCC Charter* at 2.

[17] Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignments Policies of the Private Land Mobile Services, WT Docket 92-235, *Third Memorandum Opinion and Order,* 14 FCC Rcd 10,922 (1999) at ¶ 2.

[18] The term "subscriber unit" – a term more commonly used in a commercial land mobile radio context – is used for convenience herein to encompass both hand held radios ("portables") and radios installed in vehicles ("mobiles").

[19] *See* 47 C.F.R. § 90.537.

[20] *Id.*

A. Subcommittee Recommendations

15. The NCC chair referred the trunking issue to the Interoperability Subcommittee, chaired by Sgt. John Powell of the University of California at Berkeley, who in turn, at the June 18, 1999, meeting of the NCC, assigned the task to Subcommittee Working Group No. 5 under the leadership of David Buchanan of the County of San Bernardino, California.[21] At the next meeting of the NCC subcommittees, in Lansing, Michigan, on September 23, 1999, Working Group No. 5 produced a draft report on trunking that was debated by the Subcommittee, modified appropriately, and submitted to the NCC Steering Committee on September 24, 1999. That draft document stated that several matters therein required additional attention by the Interoperability Subcommittee. The Steering Committee deferred action on the draft pending its being rendered more complete. The trunking matter was next addressed by the Interoperability Subcommittee via list server exchanges and at the subsequent subcommittee meeting in New York City on November 18, 1999. At the general membership meeting on the following day, the Interoperability Subcommittee presented a revised draft with the following principal recommendations:

- The Commission should not mandate trunking on the interoperability channels.
- "Secondary" trunking should be permitted on some interoperability channels. Secondary trunking contemplates the use of an interoperability channel as part of a larger trunked system for routine communications until the channel is needed for interoperability purposes. At such time, the channel is disconnected from the trunked system and used for conventional, *i.e.* not-trunked, interoperability communications.
- Trunking should be prohibited on some channels, thereby to make them instantly available for interoperability purposes. Calling channels are an example of channels on which trunking would be prohibited.
- A system of access priority should be established for the interoperability channels.
- "Guard channels" should be established in the reserved portion of the spectrum so that they would be available to be used as part of 25 kHz channel blocks for trunked operation on interoperability channels.

16. The Steering Committee took the Interoperability Subcommittee's draft under advisement. The Interoperability Subcommittee refined the substance and structure of the draft for presentation at the next meeting as a finished document. The Interoperability Subcommittee made final changes to the report following its meeting in

[21] *See Meeting of the Public Safety National Coordination Committee*, June 18, 1999, Tr. 12. [This and subsequent "Tr." citations are to transcripts of the NCC meetings and some subcommittee meetings. The transcripts are filed in the NCC public file "WTB-2" at FCC Headquarters, 445 12th Street, SW, Room 4-C330].

San Francisco on January 27, 2000. The report was submitted to, and approved by, the Steering Committee at its meeting on January 28, 2000.[22]

1. Compulsory Trunking

17. The Interoperability Subcommittee's recommendation that trunking should not be mandated on the interoperability channels stems principally from operational considerations. As an initial matter, the subcommittee believes that most interoperability communications will be conducted at the scene of an incident on a unit-to-unit basis, *i.e.* without use of infrastructure. Hence, because there will be a relatively small demand for interoperability communication through infrastructure, the Subcommittee believes that only a few infrastructure interoperability channels will be required in the typical case. The Subcommittee submits that the cost of configuring a small number of channels for trunked operation would not be justified by the slight increase in spectrum efficiency that might be realized.[23]

18. Additionally, were trunking mandated, all subscriber units, nationwide, would have to be equipped with trunking capability, adding cost, weight and complexity to the units. This trunking capability would go largely unused because: (a) as noted, most interoperable communications would be on a unit-to-unit basis; and (b) only large metropolitan areas would employ sufficient numbers of interoperability channels in their infrastructures to justify trunking from a cost standpoint.

19. The Interoperability Subcommittee also pointed out that,if foreign units were to respond to an incident in a given jurisdiction that employed trunking of interoperability channels, those foreign units would be required to "register" on the trunked system. Registration involves identifying the foreign unit, ascertaining the nature of the aid it will be providing and then assigning it to an appropriate "talk group" on the trunked system. This is a manual, and somewhat time consuming process. If a large number of foreign units were to respond to a major incident, there likely would be an unacceptable response delay incurred in registering such units.

2. Secondary Trunking

20. For reasons of cost, jurisdictions are more likely to implement interoperability channel systems if the interoperability channels can be used most of the time as part of a trunked system consisting primarily of General Use channels and used for day-to-day communications. In the event that an emergency required use of the interoperability channel(s) that were being used, on a secondary basis, as part of a trunked General Use channel system, the interoperability channels would be functionally "separated" from the trunked system and used only for emergency communications.

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[22] *See* Appendix C, *Policy Recommendation for Trunking on Voice Interoperability Channels*, NCC Document IO-0023B-20000208 (Trunking Recommendation).

[23] Note that the Commission's rules currently require 700 MHz public safety systems – except interoperability systems – to employ trunking only when there are 6 or more channels in the system. *See* 47 C.F.R.§ 90.537.

21. The Interoperability Subcommittee recommends that secondary trunking be permitted only if the jurisdiction employing secondary trunking maintains a continuous, 24 hours per day, 7 days per week, primary dispatch facility at which a dispatch operator can immediately revert trunked interoperability channels to conventional (*i.e.* non-trunked) use when an emergency arises.[24] However, the Subcommittee cautions that interoperability channels should not be so integral to the trunked system that it becomes "politically impossible" to extract them from trunked use when the need arises.[25] As a remedy for the potential "political" problem, the Subcommittee recommends that multi-agency licensees having 10 or fewer General Use channels may incorporate one interoperability channel as part of their systems on a secondary basis. Such licensees with more than 10 trunked channels would be permitted the secondary use of two interoperability channels. Larger multi-agency systems – those having 20 or more General Use channels – would be permitted secondary use of more than two interoperability channels on a case-by-case basis. In all such instances, use of the additional channel(s) would be subject to the approval of the cognizant Regional Planning Committee.[26] As a further means of ensuring that a sufficient number of interoperability channels is available in a given area, the Subcommittee recommends that secondary trunking be allowed only on 10 of the 32 12.5 kHz interoperability channels.[27]

3. Guard Channels

22. In the current 700 MHz channel plan contained in the Commission's rules, interoperability channels are assigned in groups of two paired 6.25 kHz channels. These two-channel groups (or "channel sets") are separated from one another by other channel assignments in the Reserved[28] category. Consequently, under the current channel plan it is not possible to obtain four contiguous interoperability channels to support any alternative technologies requiring a bandwidth greater than 12.5 kHz.

23. Based on the assumption that the channel plan eventually will be modified to permit Regional Planning Committees to assign a limited number of interoperability channels in groups of four 6.25 kHz pairs, the Interoperability Subcommittee recommends that the Commission not immediately grant licenses on the two 6.25 kHz Reserved channels directly below certain two 6.25 kHz interoperability channel sets. The certain 6.25 kHz interoperability channel sets that would be affected are the

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[24] The dispatch operator would be required to monitor the interoperability channels for emergency requests to revert the secondarily trunked channels to conventional use. The operator also would be required to be immediately accessible by telephone and facsimile in order to receive such requests.

[25] *See* Appendix C, *Trunking Recommendations* at 2.

[26] *Id.*

[27] *Id.* The Subcommittee's report assumes the use of 12.5 kHz interoperability channels. *Id.* at 2. This is consistent with the Technology Subcommittee's recommendation on technical standards. *See* ¶¶ 48-71 *infra*.

[28] "Reserved" in this context means that the channels may not be used pending the Commission's issuance of an order in response to comments submitted in the rulemaking portion of the *First Report and Order and Third Notice of Proposed Rulemaking*.

channels on which the Interoperability Subcommittee recommends that trunking be allowed. The Interoperability Subcommittee characterizes those Reserved category channels on which licenses would not be granted as "guard channels".[29]

B. Trunking – Discussion

1. Compulsory trunking

24. It was the strong consensus of the NCC subcommittee members and other NCC members who participated in public discussion of the topic, that trunking should not be mandated on the interoperability channels. After hearing the report from the Interoperability Subcommittee and discussing the matter, there was no sentiment for mandated trunking by any member of the Steering Committee. The Steering Committee therefore recommends to the Commission that trunking not be required on the interoperability channels.

2. Secondary Trunking

25. It is the consensus of the Steering Committee that secondary trunking of the interoperability channels should be permitted for the reasons advanced by the Interoperability Subcommittee.[30] However, it should be noted that Steering Committee member Douglas Aiken, representing the International Association of Fire Chiefs, dissents from the trunking recommendations.[31] In particular, Mr. Aiken believes that secondary trunking should not be permitted because of the likelihood of disputes arising in an emergency when it becomes necessary to disassociate an interoperability channel from a trunked system and revert it to conventional use.

26. There is good reason to be concerned over the issue raised by Mr. Aiken; however, the Steering Committee believes that the issue of the release of secondary trunked channels in an emergency may be addressed adequately in the manner recommended by the Interoperability Subcommittee in the document *Policy Recommendations for Channel Designation and Priorities for Voice Interoperability Channels.*[32] The document establishes a hierarchy of access priorities ranging from "single agency secondary communications" to "disaster and extreme emergency operations".[33] The Steering Committee recommends that these priorities be incorporated into the Commission's rules to the effect that, whenever any requesting party asserts a priority greater than "single agency secondary communications," an interoperability channel being used in the secondary trunked mode must immediately be reverted to conventional operation for use by the requesting party. Under the priority

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[29] *See* Appendix C, *Trunking Recommendations* at 3.

[30] *See* ¶¶ 20. - 21. *supra.*

[31] *See* Memorandum from Douglas Aiken to the NCC Steering Committee, January 27, 2000.

[32] *See* Appendix D, *Policy Recommendation for Channel Designation and Priorities for Voice Interoperability Channels,* NCC Document No. IO-0018F-19991118. (Hereinafter Voice Channel Priority Recommendations.)

[33] *Id.* at 3.

construct, the requesting party would make his or her request to the trunked system dispatch center by any available communications means, including use of the interoperability calling channels.[34] The dispatch center operator would not have the discretion to refuse such requests or to delay honoring them.

27. The concerns voiced by Mr. Aiken, and shared by the Steering Committee, appear further alleviated by the Interoperability Subcommittee's recommendation that trunking be allowed on only 10 of the 32 interoperability channels[35] and that limitations be placed on the number of interoperability channels that may be trunked on a secondary basis in any given system.[36] The 10 channel limit ensures that some interoperability channels will be immediately available, a particularly important requirement for the calling channels which are to be used, *inter alia,* to request discontinuation of secondary trunked operation when interoperability channels are needed in an emergency. The limitation on the number of interoperability channels that can be trunked on a secondary basis by any given system further assures that any problems associated with timely removing a channel from trunked operation will not leave emergency responders with a shortage of interoperability channels for use on a unit-to-unit basis.

28. Accordingly, although the Steering Committee retains some concern about delays in interoperability channel availability incurred as a consequence of secondary trunked use of interoperability channels, it believes that, on balance, the benefits of secondary trunked use outweigh the associated potential problems. The Steering Committee therefore recommends that the Commission accept the recommendations of the Interoperability Subcommittee concerning secondary trunked use of interoperability channels. The Steering Committee further recommends that the Commission adopt the provisions for access priority developed by the Interoperability Subcommittee.

3. Guard Channels

29. The Interoperability Subcommittee recommends that the Reserve channels immediately below the ten channels on which trunking is permitted be used as "guard channels" between the General Use and interoperability channel blocks. In the event that a Regional Planning Committee (RPC) elected to permit 25 kHz secondary trunked operation[37] on the ten channels on which trunking is permitted, these "guard channels" would be integrated into 25 kHz channel blocks. The net effect of the guard channel proposal is to preserve certain four channel groups to permit 25 kHz trunking[38]

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[34] *See* n.24 *supra.*

[35] *See* ¶21. and n.27 *supra.*

[36] *See* ¶ 21. *supra.*

[37] The Interoperability Subcommittee acknowledges that 25 kHz trunking would require a change in the rules. Such a change has been proposed in petitions for reconsideration of the *First Report and Order.* The proposal was endorsed by the NCC. *See ex parte* letter from Kathleen Wallman, Chair of the NCC to William E. Kennard, Chairman, FCC, October 14, 1999.

[38] The term "25 kHz trunking" as used here refers to systems that are capable of accommodating four voice paths within a 25 kHz bandwidth, *e.g.* TETRA.

when and if the Commission modifies its rules to permit aggregation of a limited number of interoperability channels in sets of four contiguous 6.25 kHz channels for use with certain trunking technologies.

30. As an initial matter, as recognized by the Interoperability Subcommittee, the use of four contiguous interoperability channels is not in accord with the current 700 MHz band plan which contains only groups of two contiguous 6.25 kHz interoperability channels. However, the Commission is considering a proposal to rearrange the band plan to provide sets of four contiguous 6.25 kHz interoperability channels (the Proposal).[39] The NCC has supported the Proposal.[40]

31. Were the Commission to adopt the Proposal before the Reserved category channels are made available for licensing, the Interoperability Subcommittee's guard channel proposal would be rendered moot. However, if Reserved category channels are made available for licensing before the Commission acts on the Proposal, then the Interoperability Subcommittee's guard channel mechanism would protect specified two-channel groups' ability to expand to a four contiguous channel group. The specified two-channel groups would remain protected until the Commission ruled on the Proposal.

32. The Steering Committee agrees on the need to preserve the possibility of converting specified two-channel groups in the interoperability band to four-channel groups, thereby to accommodate technologies that require more than a 12.5 kHz bandwidth. However, were the Commission not to approve the Proposal, then the guard channels would serve no purpose, could not be used and therefore would represent an inefficient use of the spectrum. Conversely, if the Commission approves the Proposal, the guard channels would no longer be necessary. Accordingly, the Steering Committee supports the Interoperability Subcommittee guard channel proposition, but recommends to the Commission that any rules implementing that proposition sunset at such time as the Commission issues a final order disposing of the pending Proposal.

IV. ADMINISTRATIVE OVERSIGHT OF INTEROPERABILITY CHANNELS

33. The Interoperability Subcommittee document, Policy Recommendations for Administrative Oversight of Interoperability Channels (Administrative Oversight Document) recommends: (a) the formation of State Interoperability Executive Committees; (b) that the Commission should license subscriber equipment operating on interoperability channels; (c) that Regional Planning Committees should oversee interoperability infrastructure and (d) adoption of standardized templates for memoranda

[39] *See* n.37 *supra.*

[40] *Id.*

of understanding between State Interoperability Executive Committees and sharing agreements between jurisdictions.[41]

A. State Interoperability Executive Committees

34. The Interoperability Subcommittee recommends that administration of interoperability channels take place at the state level or, if the state is unwilling to do so, that the Regional Planning Committees assume the responsibility.[42] At the state level, State Interoperability Executive Committees (SIEC) would be formed with representatives from various governmental units and disciplines.[43] The Interoperability Subcommittee recommends wide federal participation in the SIECs.[44] The SIECs would enter into binding memoranda of understanding (MOU) with each user of interoperability channels within the SIEC's jurisdiction. The Interoperability Subcommittee recommends that the Commission make execution of such an MOU a prerequisite to grant of a license to operate on the interoperability channels. The SIECs would be charged with enforcement of the terms of the MOU, with final enforcement authority vested in the Commission.[45]

B. Commission Licensing of Subscriber Equipment

35. The Interoperability Subcommittee recommends that the Commission license subscriber equipment, thereby to forestall abuse of the interoperability channels of the kind said to have been encountered with the five interoperability pairs in the 821-824 MHz and 866-869 MHz bands. The Interoperability Subcommittee submits that, absent such licensing – and associated FCC enforcement authority – there would be no direct penalty for abuse of the interoperability channels.[46]

C. RPC Oversight of Interoperability Infrastructure

36. The Interoperability Subcommittee recommends: (i) that oversight of the technical parameters of interoperability infrastructure should rest with the RPCs; (ii) that the RPCs should urge the states to develop interoperability operational plans – and failing that, to develop such plans independently; and (iii) that the RPCs should request the states to hold the licenses for infrastructure – and, failing that, to have the licenses held by the next highest level of government.[47]

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[41] *See* Appendix E, *Policy Recommendations for Administrative Oversight of Interoperability Channels*, NCC Document IO-0036E-20000224 (Administrative Oversight Document) at 3-4.

[42] *See id.* at 1.

[43] The formation of State Interoperability Executive Committees is endorsed by the Public Safety Wireless Network. *See* Appendix L.

[44] *See Administrative Oversight Document* at 2.

[45] *Id.*

[46] *Id.*

[47] *See id.* at 3-4.

D. MOU and Sharing Agreement Templates

37. Included with the Interoperability Subcommittee recommendations are templates for: (i) memoranda of understanding between the SIECs and interoperability channel applicants; and (ii) sharing agreements whereby a licensee authorizes non-licensees, federal government agencies and non governmental organizations (NGOs) to operate subscriber equipment on the licensee's system.[48] The sharing agreement template is designed for non-licensees, NGOs and federal agencies. Sharing of interoperability spectrum would be on the basis of an *ad hoc* "virtual sharing agreement" that would begin at the inception of an incident response and terminate at the conclusion of such incident.[49] Use of "virtual sharing agreements" would be restricted to licensees eligible for use of the interoperability channels and non-licensees, NGOs and federal agencies that have executed written sharing agreements in their home jurisdictions.

E. Administrative Oversight – Discussion

38. The Interoperability Subcommittee's recommendation for administrative oversight of the interoperability channels rests on the Subcommittee members' day-to-day experience with the administration of radio facilities and therefore is entitled to considerable deference. The recommendation for the establishment of SIECs is sound and the Steering Committee endorses it. However, it is difficult to see how the Commission would treat such a recommendation except to itself encourage the formation of SIECs: the Steering Committee does not foresee the Commission establishing a rule mandating the establishment of SIECs.

39. The Steering Committee endorses the Interoperability Subcommittee's recommendation that subscriber equipment be licensed if such licensing can be accomplished without undue burden on the Commission's resources.

40. As the Interoperability Subcommittee notes, the RPCs are charged with administration of the General Use channels;[50] thus they are a reasonable choice to administer the technical aspects of the interoperability channels. The Steering Committee therefore recommends that the Commission assign that task to the RPCs. The Interoperability Subcommittee's recommendations that the RPCs urge the states to develop interoperability operational plans and request the states to hold infrastructure licenses have merit. The Steering Committee endorses those recommendations, but with the understanding that they may not be suitable for embodiment in a Commission rule.

41. The MOU and sharing agreement templates appear to contain the minimum elements of information that should be included in such documents. The SIECs and relevant agencies may adapt the templates to their own needs. The

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[48] *See id.* at 5-7.

[49] *See id.* at 3.

[50] *See id.* at 2.

Steering Committee notes the requirement, in the MOU template, that the document be attached to the party's FCC application. This requirement may raise Paperwork Reduction Act[51] concerns and may be incompatible with the Commission's Universal Licensing System. The Commission may therefore prefer to have applicants certify that they have entered into an MOU, rather than file the actual document.

V. CHANNEL DESIGNATION AND ACCESS PRIORITY

42. The Interoperability Subcommittee has proposed a table of channel assignments for the interoperability channels.[52] Each channel set, *i.e.* two 6.25 kHz channels, in the table is devoted to a particular purpose and assigned a label *e.g.* interoperability channels 55 and 56 make up a channel set that is labeled "GTAC 5" and is devoted to General Public Safety Services.

A. Nomenclature

43. The Interoperability Subcommittee recommends that the Commission require standardized labeling of channels on subscriber equipment, conforming to the labels contained in the Interoperability Subcommittee's proposed table of assignments. When subscriber units are operated in the direct (simplex) mode, a "D" should be appended to the display of the channel label.[53]

B. Access Priority

44. As noted in the discussion of trunking,[54] the Interoperability Subcommittee has established access priorities that establish what classes of communications take precedence when more than one party seeks access to an interoperability channel. The recommended access priorities are:

(1.) Disaster and extreme emergency operations for mutual aid and interagency communications.

(2.) Emergency or urgent operation involving imminent danger to life or property.

(3.) Special event control, generally of a preplanned nature (including task force operations).

(4.) Single agency secondary communications.[55]

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[51] *Paperwork Reduction Act of 1995,* Pub. L. 104-13, 44 USC § 3507.

[52] *See* Appendix D, *Voice Channel Priority Recommendations at* 5.

[53] *See id.* at 4.

[54] *See* ¶ 26. *supra.*

[55] *See* Appendix D, *Voice Channel Priority Recommendations* at 3. *See also* n.4.

C. Calling Channels

45. The Interoperability Subcommittee proposes that two of the interoperability channel sets be reserved as calling channels. These calling channels, which appear in the Table of Interoperability Channels as "CALL 7A" and CALL 7B" must be monitored, as appropriate, by licensees who employ interoperability infrastructure in the associated channel group. When calling channels are integrated into infrastructure, their coverage must at least match the coverage of the other interoperability channels in the system. In addition to the usual calling channel functions, the calling channels are to be used to notify users when a priority is declared on one or more of the tactical interoperability channels. Encryption would be prohibited on calling channels.[56]

D. Encryption

46. The Interoperability Subcommittee recommends that, if encryption is used on interoperability channels, a single, standard encryption algorithm must be employed.[57] Because the federal government will be making use of the interoperability channels, and because the federal government normally encrypts its communications, the Interoperability Subcommittee considered the latest government encryption standard "FIPS 46-3" as an encryption standard for the interoperability channels.[58]

E. Discussion – Channel Designation and Access Priority

47. The Interoperability Subcommittee's proposed access priority standards are taken from the PSWAC Report,[59] and represent the consensus opinion of experts in the field. The Steering Committee recommends that the Commission incorporate the standards into its rules. The rules should also designate calling channels as proposed by the Interoperability Subcommittee. The calling channels are essential, *inter alia*, to notify licensees that use interoperability channels in the secondary trunked mode to revert the channels to the conventional mode when the need arises. The Steering Committee also recommends that the Commission amend its equipment certification rules to require subscriber units to display channel labels as shown in the Interoperability Subcommittee's proposed table of assignments. There is increasing use of encryption by public safety entities and a unified standard must be used on the interoperability channels. The Steering Committee thus recommends that the Commission incorporate the "FIPS 46-3" standard in the rules and prohibit the use of other encryption algorithms on the interoperability channels.

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[56] *Id.*

[57] *Id.* at 4.

[58] *Federal Communications Commission Public Safety National Coordination Committee*, Jan. 14, 2000, Tr. 48.

[59] *Report of the Public Safety Wireless Advisory Committee*, September 11, 1996

VI. TECHNICAL STANDARDS

A. Background

48. In the *First Report and Order,* the Commission created the 700 MHz public safety narrowband band plan based on 6.25 kHz channels and said that it expected that in the next few years, technology would advance to the point that the 6.25 kHz channels could be used individually for the transmission of voice and data.[60] The Commission also determined that digital modulation was to be used on the interoperability channels, although subscriber equipment could have analog capability as a secondary mode of operation.[61] Spectrum efficiency was defined in terms of a minimum data rate of 4800 bps per 6.25 kHz bandwidth.[62]

49. At the time of the *First Report and Order*, the Commission declined to adopt the digital standard commonly known as Project 25 Phase I[63] because it is a digital standard based on 12.5 kHz wide channels rather than a narrower bandwidth. However, the Commission arranged the band plan so that 6.25 kHz channels could be combined and used as 12.5 kHz channels until 6.25 kHz equipment becomes available.[64] The Commission noted that a Project 25 Phase II standards setting activity was underway and held promise for achieving one voice channel per 6.25 kHz.[65] The Commission also noted that other technologies were under development that would provide equivalent spectrum efficiency with wider emissions.[66] The NCC was charged with developing or recommending a digital standard and, in its Charter, was required to present the Commission, within one year, with technical standards that would allow use of the 700 MHz public safety spectrum while final rules were being developed.[67]

B. Narrowband Digital Voice Standards

50. The NCC Chair referred the matter of narrowband digital standards to the Technology Subcommittee, chaired by Glen Nash of the State of California Department of General Services who in turn assigned the task of developing narrowband voice standards to Technology Subcommittee Working Group Number 2 under the leadership of Robert Schlieman of the New York State Police.

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[60] *See First Report* at ¶ 38.

[61] *Id.* at ¶¶ 110, 113.

[62] *Id.* at ¶ 37.

[63] Project 25 consists of a suite of standards that cover, *e.g.* voice transmission, data transmission, trunking, etc. It is defined by ANSI standards in the ANSI 102 series, *e.g.* ANSI/TIA/EIA 102.BAAA defines the common air interface. For purposes of convenience the ANSI 102 series standards recommended by the subcommittees are referred to herein collectively as "Project 25 Phase 1."

[64] *See id.* at ¶ 113 and n.291.

[65] *See id.* at ¶ 113.

[66] *Id.* Subsequent to the Commission's order, a Project 25 Phase II standard was completed. *See* ¶55. *infra.*

[67] *See* Appendix A, *NCC Charter* at 2.

51. The working group began its efforts by evaluating available digital standards. This was accomplished by soliciting suggestions for appropriate standards from the members of the Technology Subcommittee and the NCC general membership. Three standards were identified:

- Project 25 Phase I, a 12.5 kHz Frequency Division Multiple Access (FDMA) standard.
- Project 25 Phase II, a 6.25 kHz FDMA standard.
- European Technical Standards Institute (ETSI) 392 TETRA (TErrestrial Trunked Radio) system, a four-slot TDMA standard in which four voice channels are realized within a 25 kHz bandwidth; and ETSI 396, a two-slot TDMA standard applicable to unit-to-unit communications.[68]

52. The identified standards were evaluated by developing a series of questions – which the working group characterized as a "matrix" – that set out desirable characteristics for a digital modulation system, queried whether a given existing standard met those characteristics and asked for comment. The "matrix" was made available to all NCC members by distribution of paper copies at NCC meetings and electronically via the Technology Subcommittee listserver.

53. Extensive discussions, in person and electronically, were held regarding the digital standards under consideration. The discussions encompassed all known digital standards suitable for operation within the criteria that the Commission has established for the 700 MHz public safety band and some standards and proposals that would require amendment of those criteria.

1. Project 25 Phase I

54. The Technology Subcommittee's analysis of the matrix responses caused it to find a clear preference for Project 25 Phase I as a standard. Many of the NCC members preferred this standard because it has successfully been implemented in other bands, including the 800 MHz public safety frequencies. Timely availability of equipment was also an important factor. The Technical Subcommittee chair, Glen Nash, in speaking to the factors that led the subcommittee to its recommendations, said that "the issue of timeliness was an overriding factor in the [sub]committee's recommendation for the 12.5 kHz Phase 1 mode."[69] The 12.5 kHz standard allows conventional, trunked and unit-to-unit operation. It is an official ANSI (American

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[68] The ETSI 396 and 392 standards currently are not approved by ANSI. The Project 25 Steering Committee – not a part of the NCC – in conjunction with the Telecommunications Industry Associations is in the process of developing a TETRA variant that would incorporate certain changes important to the United States public safety community. *See* ¶ 58. *infra.*

[69] *See* Appendix F, *Full Membership Meeting Before the Federal Communications Commission of the Public Safety National Coordination Committee,* Nov. 19, 1999, Tr. 12, 13.

National Standards Institute) standard.[70] The standard meets the Commission's 4800 bps per 6.25 kHz spectrum efficiency standard, *i.e.* it allows a data rate of 9600 bps in a 12.5 kHz channel. The standard uses C4FM modulation, a constant amplitude carrier form of modulation that does not require linear power output amplification.[71]

2. Project 25 Phase II

55. Project 25 Phase II also allows conventional, trunked and unit-to-unit communication. It provides a data rate of 9600 bps in a 6.25 kHz bandwidth and therefore meets the Commission's 4800 bps per 6.25 kHz spectrum efficiency standard. However, the standard uses CQPSK modulation that requires linear power amplification. Because a linear power amplifier draws more current than a non-linear amplifier – all other things being equal – a Project 25 Phase II subscriber unit would require a higher capacity, and heavier, battery than a Project 25 Phase I subscriber unit. Alternatively, assuming the same capacity battery, the Project 25 Phase II subscriber unit would discharge its battery – and require recharging – sooner than a Project 25 Phase I radio.

56. In addition, the Technology Subcommittee submits that the high-stability oscillators that would be required in Project 25 Phase II subscriber equipment are not commercially available.[72] Project 25 Phase II is an official ANSI standard; however, it has not been implemented in commercially available equipment in any band. Accordingly, notwithstanding the greater spectrum efficiency of Project 25 Phase II, it is not recommended by the Technology Subcommittee as a standard that the Commission should adopt at this time.

3. TETRA

57. TETRA requires 25 kHz channels in which to operate and, when operating through infrastructure, can derive four voice paths in that bandwidth. However, the Commission's 700 MHz public safety band plan does not include groups of four contiguous 6.25 kHz interoperability channels that would be necessary to create a 25 kHz channel for TETRA operation. TETRA allows conventional, trunked and unit-to-unit communication. TETRA subscriber equipment is somewhat more flexible than Project 25 equipment in the number of transmission modes it can provide.[73] However, TETRA cannot support the conventional, *i.e.* non-trunked, operation deemed important by the Technology Subcommittee because TETRA infrastructure operates only in the trunked mode.

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[70] For information concerning ANSI and its standard-setting activities *see Public Safety National Coordination Committee*, June 18, 1999, Tr. 110-126.

[71] *Id.* An amplifier is said to be linear when its output is an accurate representation of its input.

[72] *See* Appendix G, *700 MHz Baseline Standard Common Air Interface for Narrowband Interoperability Channels*, at 3.

[73] *Id.*

58. The Technology Subcommittee has noted that, as with Project 25 Phase II, the TETRA system requires linear power amplifiers in its subscriber equipment. As a consequence, TETRA hand-held units have been designed with a lower power output than Project 25 Phase I hand held units (1 Watt *vs.* 3 Watts).[74] According to the Technology Subcommittee, this has two consequences: (1) more base stations are required in the TETRA infrastructure than in a Project 25 infrastructure; and (2) TETRA hand held units have inferior unit-to-unit range and building penetration capability compared to Project 25 Phase I hand held units.[75] TETRA is not an ANSI-approved standard. Although the ETSI[76] and ANSI standards setting processes are similar, there is no reciprocal acceptance of standards between the two organizations.

59. The Project 25 Committee – not associated with the NCC – has accepted a proposal by the TETRA MOU group for a Project 25 Phase II TDMA standard and has recommended that the proposal be developed as a standard by the Telecommunications Industry Association (TIA). In this proposed standard, the IMBE vocoder[77] is used instead of the TETRA standard Thomson ACELP standard vocoder.[78] The use of a common vocoder allows interconnection of Project 25 and the TETRA variant equipment without the degradation in voice quality and additional transmission delay that would result were two different vocoders used in the interconnection process.[79] Moreover, use of a common vocoder in interconnected systems obviates security concerns associated with the need to decrypt and re-encrypt encrypted signals when different vocoders are used as part of the interconnection process. The Project 25 Committee has also accepted a proposal by Com-Net Ericsson for a Project 25 Phase II two-slot TDMA standard and has recommended that the proposal be developed as a standard by TIA. This proposed standard also incorporates the IMBE vocoder and realizes two voice paths in a 12.5 kHz bandwidth.[80]

60. Both Com-Net Ericsson and the TETRA MOU group incorporated into their Project 25 Phase II proposed standards the requirement that subscriber equipment built to that standard must be capable of communicating with Project 25 Phase I subscriber units and infrastructure. Thus, subscriber units manufactured to that standard could communicate with Project 25 Phase I subscriber units on a unit-to-unit basis and also could function within a Project 25 infrastructure in a non-trunked mode.

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[74] The Project 25 Phase I subscriber units currently manufactured for the 800 MHz band have 3 watts power output. It is reasonable to assume that units manufactured for the 700 MHz band also will have 3 watts power output.

[75] *Id.*

[76] *See id.* at 4; *see also* ¶ 50. *supra.*

[77] The vocoder is defined by the ANSI-102.BABA standard.

[78] The commitment to use the IMBE vocoder may not be firm. At the January, 2000 Project 25, meeting, the TETRA MOU group noted that the vocoder was not part of the Project 25 Statement of Requirements and that it therefore may reconsider recommending that the IMBE vocoder be included in its proposed standard.

[79] *See* Appendix G at 5.

[80] *Id.*

In the Project 25 Phase I mode, the output power of the TETRA variant subscriber units, manufactured to the standards being developed, is expected to be essentially the same as that for a Project 25 Phase I subscriber unit.

61. Manufacturer Nokia has argued that dual-mode subscriber equipment of the kind described by Com-Net Ericsson and the TETRA MOU group is not feasible in the short term. As an alternative, Nokia proposed that TETRA and Project 25 subscriber units should have analog FM capability for use in unit-to-unit communication and that analog should be the main interoperability mode. Nokia also proposed that TETRA infrastructure be equipped with "analog overlay coverage" to permit the FM-capable subscriber equipment to communicate through infrastructure. The Nokia proposal was first raised in a letter to NCC chair Kathleen Wallman on January 20, 2000, and Nokia presented its alternative proposal to the NCC Technology Subcommittee at its meeting in San Francisco on January 27, 2000.[81] There was no support for the Nokia proposal from the Subcommittee or the other NCC members. Moreover, there was no indication that the TETRA system proposed by Nokia has been submitted to, much less approved by, ANSI. Thus, it is unlikely that the Nokia proposal could be implemented in the short term.

C. Narrowband Low Speed Data Transmission

62. The NCC Interoperability Subcommittee developed a User Needs Statement of Requirements for Low Speed Data on Interoperability Channels.[82] That document contains illustrative uses of a data channel with a gross channel data rate of 9600 bps and a typical error corrected throughput of 4800 bps.[83] A data channel with those characteristics would be suitable for the exchange of keyboard messages and the uploading and downloading of short files, *e.g.* 100 kb files. The gross data rate meets the Commission's requirements for spectrum efficiency in a 12.5 kHz channel.

63. The Interoperability Subcommittee recommended that any data standard developed include: (a) unit-to-unit capability; (b) operation through infrastructure; and (c) operation through the use of relay stations in either a repeater or store and forward mode. The standard should be compatible with Internet Protocol (IP) and have a robust system of unit identifications that allows use of tactical identifiers that may be assigned as an incident develops.[84] The Interoperability Subcommittee also recommended a change in its proposed table of assignments[85] to specify that interoperability channels 21 (700 MHz band plan channels sets 379 & 380) and 51 (700 MHz band plan channel sets 859 & 860) be reserved for data transmission.

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[81] *See Public Safety National Coordination Committee Subcommittee on Technology, January 27, 2000, Tr. 62-121.*

[82] *See* Appendix H, *User Needs Statement of Requirements for Low Speed Data Standards on Interoperability Channels*, NCC Document IO0037D-20000128 (User Needs for Data).

[83] At a bit error rate of 1×10^{-6}. *See* Appendix H at 2.

[84] *See* Appendix H *User Needs for Data* at 2.

[85] *See* ¶ 42. *supra.*

64. Subsequently, the Technology Subcommittee reached consensus on a series of standards that would satisfy the Interoperability Subcommittee's user needs analysis.[86] After soliciting comment from manufacturers and others at the NCC meetings on January 13 and 14 in Washington, DC, the Technology Subcommittee came to the conclusion that only one technology was suitable. That technology, which is incorporated in the Project 25 suite of standards is defined by an ANSI standard and four TIA/EIA interim standards.[87]

65. The Technology Subcommittee's choice of standards requires use of a 12.5 kHz channel. The Subcommittee reported that it had analyzed and considered use of a 6.25 kHz channel bandwidth to accommodate the data rates necessary to meet users' needs, but concluded that there were technical problems associated with such transmission in a 6.25 kHz channel and that those problems were not likely to be overcome for several years.[88] Moreover, use of a 12.5 kHz channel for voice, as recommended, and a 6.25 kHz channel for data would require use of two different common air interfaces, thereby increasing the complexity and cost of equipment.

D. Wideband Data Standards

66. The Interoperability Subcommittee surveyed equipment suppliers, NCC members and others concerning user needs for wideband data systems that may be accommodated within a 50 kHz – 150 kHz bandwidth and found little on which to develop a set of user needs leading to definition of appropriate standards for this spectrum. Further work is required and will be conducted.

67. The Technology Subcommittee has reviewed existing standards to determine whether any would be appropriate to recommend to the Commission at this time and has concluded that none are. To assist the NCC in the effort to define a wideband standard, the NCC Chair contacted the Telecommunications Industry Association (TIA) and asked TIA to begin the standards-setting process to develop a wideband data standard. TIA has honored that request and the matter currently is under consideration by the TIA TR-8 subcommittee.

E. Technical Standards – Discussion

68. It was the consensus of the Technology Subcommittee, with which the Steering Committee concurs, that Project 25 Phase I be advanced to the Commission as the digital standard for the 700 MHz public safety band. Project 25 Phase II was not selected primarily because of perceived delays in the availability of Phase II technology on the order of five years. The battery current drain issue was also a factor: the Technology Subcommittee members believe that hand held radios with excessively heavy battery packs or hand held radios that require frequent battery recharging or

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[86] *See* Appendix I, *Memorandum from Glen Nash, Chair, Technology Subcommittee to Kathleen Wallman, Chair, NCC,* dated February 4, 2000 (Data Technical Standards).

[87] *Id.*

[88] *See id.* at 2.

changing are not compatible with modern public safety tactical operations. TETRA was not selected primarily because of the low power of its hand held radios which would result in coverage range limitations and inferior building penetration relative to Project 25 Phase I radios. Inferior building penetration, in particular, was thought to be an important safety issue, especially for fire and police operations. In addition, the Technology Subcommittee's decision was affected by the fact that TETRA is not an ANSI standard and that the 700 MHz public safety band plan does not supply the four contiguous interoperability channels required by TETRA.

69. The Steering Committee agrees with the selection of Project 25 Phase I as an interoperability standard notwithstanding it requires 12.5 kHz per voice path. The technology readiness obstacles currently associated with Project 25 Phase II – battery size and weight and oscillator stability – may well be solved in the future. However, today, it does not appear feasible to overcome these obstacles in time to provide the public safety community with timely interoperable 700 MHz service. Yet the Steering Committee is mindful of the remarks of WTB Chief Thomas Sugrue, at the January 14, 2000, NCC meeting, to the effect that the Commission seeks "a recommendation for standards that represent the latest in today's technology and that have a clear, timely and realistic migration path to more spectrum-efficient technology in the future." The establishment of such a migration path will continue to be pursued by the NCC. With regard to TETRA, the inherent low power output of the hand held units and the concomitant reduction in range and building penetration when the hand helds are used in the unit-to-unit mode are unacceptable limitations when a better performing alternative – Project 25 Phase 1 – is available. The Steering Committee is also mindful of the fact that the Commission, in the *First Report* and in the *Memorandum and Order on Reconsideration*[89] made it clear that any standard recommended by the NCC "must be developed under an 'open process governed by ANSI or standards approved by ANSI'".[90] TETRA is not ANSI approved. The "analog overlay" proposed by Nokia runs counter to the Commission's determination that all interoperability infrastructure is to use a digital modulation mode. The Steering Committee consensus was not endorsed by Steering Committee member Douglas Aiken, representing the International Association of Fire Chiefs, who disfavored Project 25 Phase I on the basis that it was not spectrum-efficient and because of a perceived lack of competition. Mr. Aiken proposed the use of analog FM pending the development of a more spectrum efficient digital technology.

70. The Steering Committee also agrees with the selection of an ANSI standard and TIA/EIA interim standards for data transmission. The standards selected meet the Commission's requirement that they be developed in an open process

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[89] The Development of Operational, Technical, and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, Establishment of Rules and Requirements for Priority Access Service, WT Docket No. 96-86, *Memorandum Opinion and Order on Reconsideration,* FCC 99-85 (May 4, 1999). (Memorandum Opinion and Order on Reconsideration.)

[90] *Id.* at ¶ 12 *quoting First Report and Order* at ¶ 122.

governed by ANSI.[91] It is anticipated that the TIA/EIA interim standards will become final upon publication, which is expected shortly.[92]

71. The Commission, and this Steering Committee, favor standards that will promote competition in the industry. This goal will be further advanced by the Project 25 Phase II standards defining TETRA variant subscriber units that have Project 25 Phase I as an auxiliary operational mode. This will make it possible for users to elect TETRA systems for use on the General Use channels while preserving the ability of its personnel to communicate on a unit-to-unit basis with Project 25 subscriber equipment and to operate within Project 25 infrastructure in a non-trunked mode on the Interoperability Channels. The competitive goals of the Commission also appear to be advanced by the several manufacturers who now offer Project 25 Phase I equipment in other bands and who have indicated their intent to enter the market in the 700 MHz public safety band.

VII. FEDERAL USERS OF THE INTEROPERABILTY SPECTRUM

72. The Federal Law Enforcement Users Group (FLEWUG) submitted a recommendation to the NCC titled Federal Co-Equal Access to Non-Federal Spectrum in the 764-776 and 794-806 MHz Frequency Band.[93] In substance, FLEWUG asks that the NCC recommend to the FCC that its service rules be sufficiently "flexible" so that federal, state and local authorities may enter into agreements for joint development of communications systems in which federal users would have "equal rights to the spectrum" and no user would have priority over another unless otherwise agreed.[94]

73. The Steering Committee endorses the FLEWUG recommendation and supports the rule flexibility that FLEWUG seeks. Because FLEWUG was not specific as to which rules – or rule provisions – it referred, the Steering Committee is unable to make a definite rule change recommendation to the Commission; if, indeed, such a change is required. In that connection the Steering Committee notes that Section 2.103 (b) of the Commission's rules appears to offer considerable flexibility. Although the rule is silent on the matter of equal access to spectrum when agreements are concluded between federal and non-federal entities, it in no way prohibits the parties contractually committing to such equal access provisions.

VIII. PRE-COORDINATION DATA BASE

74. The National Public Safety Telecommunications Council (NPSTC) has requested the NCC to recommend that the Commission take whatever action is necessary to ensure that the Regional Planning Committees make mandatory use of a 700 MHz public safety band pre-coordination database when specifying interoperability

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[91] *See Memorandum Opinion and Order on Reconsideration* at ¶¶ 12-13

[92] *See* Appendix I, *Data Technical Standards* at 2.

[93] *See* Appendix J, *Federal Co-Equal Access to Non-Federal Spectrum in the 764-776 and 794-806 MHz Frequency Band.*

[94] *Id.*

channel assignments.[95] The database is to be used on a real time basis to provide optimum spectrum use and to avoid selection of channels that would result in interference conflicts.[96] The database would be provided and maintained by the National Law Enforcement and Corrections Technology Center – Rocky Mountain Region (NLETC) and would be funded by the National Institute of Justice (NIJ). The Steering Committee, as requested, endorses use of this database, believes it will be valuable to the RPCs and recommends that its use be made mandatory.[97]

IX. INTELLECTUAL PROPERTY RIGHTS

75. The Commission has concluded that it will not accept an NCC standards recommendation unless each holder of relevant intellectual property rights (IPR) files a statement with the NCC that it will either make its technology available without compensation or will license that technology to applicants under reasonable terms, free of discrimination.[98] Representations in that regard have been received from Project 25 Phase I IPR holders Motorola, Digital Voice Systems, Inc. and Com-Net Ericsson.

X. CONCLUSION

76. This report represents the NCC's best judgment on standards that may be established to allow the public safety community to use the 700 MHz interoperability spectrum while final rules are being developed. As stated in its Charter, the NCC has an obligation to monitor industry standards-setting activities.[99] Accordingly, the Steering Committee will promptly advise the Commission if technological developments merit any changes to the standards recommended herein.

The NCC will now proceed to the balance of its assigned task to formulate and submit to the Commission an operational plan that may be implemented in final rules that will facilitate the achievement of nationwide interoperability in the 700 MHz public safety band and such other bands as may be designated for interoperability use. In that connection, the NCC will recommend final technical standards, including receiver standards and whatever other technical capabilities may be necessary to provide local, state and federal government with an optimum interoperable network. Particular attention will be directed to technical solutions that provide a graceful, cost effective migration path to more spectrum efficient technology, and to the development of optimum wideband data transmission standards. The NCC will also continue to work with the RPCs to realize the goals of efficient and effective spectrum use and will

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[95] *See* Appendix K, *Letter from Marilyn Ward, Chair, NSPTC to Kathleen Wallman, Chair, NCC*, dated April 22, 1999.

[96] *Id.*

[97] The database would also facilitate RPC compliance with § 90.527(a)(7) of the Commission's rules.

[98] *See Memorandum Opinion and Order on Reconsideration* at ¶ 20, *modifying First Report and Order* ¶ 122.

[99] *See* Appendix A, *NCC Charter* at 2.

continue to provide recommendations to the Commission on technical and policy matters that relate to issues of interoperability.

Respectfully submitted,

Kathleen Wallman,
Chair