

Public Safety Wireless Network

Achieving Interoperability Through Cooperation and Coordination

July 17, 2000

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Magalie Roman Salas
Secretary
Federal Communications Commission
TW-A325
445 Twelfth Street, SW
Washington, DC 20554

Re: Reply Comments in response to comments filed by other parties regarding the Commission's Notice of Inquiry, *In the Matter of Inquiry Regarding Software Defined Radios*, in ET Docket No. 00-47

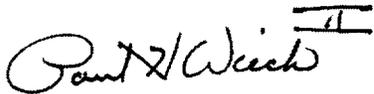
Dear Ms. Salas:

On behalf of the Public Safety Wireless Network (PSWN) Program and pursuant to Section 1.419 of the Commission's rules, 47 C.F.R. § 1.419 (1999), enclosed herewith for filing are an original and four (4) copies of the PSWN Program's Reply Comments in the above-referenced proceeding.

Kindly date-stamp the additional, marked copy of this cover letter and return it in the envelope provided.

Should you require any additional information, please contact the undersigned.

Respectfully submitted,



Brigadier General Paul H. Wieck II
Iowa Army National Guard
Chair, PSWN Executive Committee
Spectrum Working Group

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Before the
Federal Communications Commission
Washington, DC 20554

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PUBLIC SAFETY WIRELESS NETWORK PROGRAM'S
REPLY COMMENTS IN RESPONSE TO COMMENTS FILED TO NOTICE OF
INQUIRY

1. The Public Safety Wireless Network (PSWN) Program¹ respectfully submits the following Reply Comments in response to comments filed by other parties regarding the Commission's Notice of Inquiry, *In the Matter of Inquiry Regarding Software Defined Radios*.² In the Software Defined Radio (SDR) Notice of Inquiry (NOI), the Commission requests information from the wireless community on SDR technology to help guide possible policy and regulation in such matters.

I. BACKGROUND

2. As an entity dedicated to fostering public safety wireless communications interoperability throughout the Nation and at all levels of government, the PSWN Program is greatly interested in the development and proliferation of new technology such as SDR. The PSWN Program is

¹ The PSWN Program is a federally-funded initiative operating on behalf of all local, state, and federal public safety agencies. The Department of Justice and the Department of the Treasury are jointly leading the PSWN Program's efforts to plan and foster interoperability among public safety wireless networks. The PSWN Program is a 10-year National Partnership for Reinventing Government (NPRG) initiative. The NPRG, previously known as the National Performance Review, is an effort to reengineer how government provides services to citizens through more effective use of information technology and through more concerted partnership efforts among government at all levels.

² ET Docket 00-47, rel. March 21, 2000.

currently interested in the possible benefits of the technology, particularly with respect to interoperability. The PSWN Program is also obviously concerned with impediments that SDR technology could introduce to public safety wireless communications (e.g. interference). The PSWN Program wants to ensure that, in developing SDR technology; in using it to facilitate interoperability, efficiency, and spectrum sharing between and among various user groups; and in undertaking the approval of equipment to be tested and eventually incorporated into operating systems, that the Commission considers the potential long-range effects on the public safety community as a whole of this compelling but as-yet uncertain technology.

II. STATE OF SOFTWARE DEFINED RADIO TECHNOLOGY

3. At the outset, the PSWN Program wishes to highlight the fact that SDR technology is in its infancy and agrees with those Commenters that focus on the limitations of current SDR technology rather than speculating on its prospective, but as-yet unsubstantiated, benefits. Specifically, the PSWN Program agrees with the Association of Public-Safety Communications Officials-International, Inc. (APCO) that reliance on SDR technology in public safety for frequency selection could create communication problems as a result of difficulties such as radio software “glitches” that cause serious interference.³ The PSWN Program also concurs with the position of Nokia, Inc. (Nokia) that the SDR technology would not address all key system parameters, e.g., transmit power, that would affect spectrum-sharing capabilities.⁴

III. INTEROPERABILITY

4. In general terms, and assuming the technological issues discussed above can be satisfactorily addressed, the PSWN Program is cautiously optimistic, concurring with Commenters, including the American Petroleum Institute (API), that SDR technology could be critical in emergency situations because it can quickly enhance interoperability.⁵ The PSWN Program notes with interest the Comments of Motorola, Inc. (Motorola) regarding the potential

³ APCO Comments at p. 2.

⁴ Nokia Comments at p. 7.

⁵ API Comments at p. 4, para. 6.

of Wireless Information Transfer System (WITS™) –enabled technology to address the interoperability needs of public safety agencies.⁶ Motorola correctly indicated that public safety agencies face interoperability issues based on frequency diversity, different signaling protocols, standards of operation, and encryption algorithms.⁷ The PSWN Program shares Motorola’s enthusiasm that these impediments to interoperability may be overcome eventually with an SDR gateway system that would create that vital public safety communications link and that SDRs may even establish a set of air interface standards for public safety.⁸

5. The PSWN Program, which has identified the acceptance and use of industry standards as a key component in establishing national interoperability,⁹ concurs with the National Telecommunications and Information Administration (NTIA) in citing the potential advantages of local, state, and federal agencies being able to use a single general-purpose waveform processor to implement multiple interface standards in a single radio despite several other differing factors. The PSWN Program notes, as did the NTIA, that the Public Safety Wireless Advisory Committee (PSWAC) saw programmable radios as a potential solution for multiple frequency bands/air interfaces.¹⁰

6. Although the PSWN Program does not challenge the assertion of Ericsson, Inc. (Ericsson) that SDR technology would not change interoperability because multi-band and dual-band devices can already be built without such advances,¹¹ the PSWN Program observes, based on the experience of its members and the public safety community at large, that multi-band radios have significant cost, operational, and practical limitations that have not yet been overcome—and that remain a significant barrier to interoperability. Although Ericsson’s assertion may well reflect the current state of SDR technology, the PSWN Program is hopeful that this technology could offer the potential to address this challenge in the future. In the near term, the PSWN Program agrees with BellSouth that, although SDRs may facilitate interoperability by

⁶ Motorola Comments at p. 9.

⁷ *Id.* at pp. 18–19.

⁸ *Id.*

⁹ See, e.g., PSWN Program Ex Parte Comments, WT Docket 96–86, January 13, 2000, at para. 16–22.

¹⁰ NTIA Comments at p. 13. See also, Technology Subcommittee Report, *Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission*, Reed E. Hundt, Chairman, and the National Telecommunications and Information Administration, Larry Irving, Assistant Secretary of Commerce for Communications and Information (PSWAC *Final Report*) (1996), at p. 239.

¹¹ Ericsson Comments at p. 3.

providing multi-band, multi-mode capabilities, other aspects of intersystem operation need to be examined to achieve the intended flexibility for SDRs.¹²

IV. IMPROVING SPECTRUM EFFICIENCY AND SPECTRUM SHARING

7. As stated above, the PSWN Program is concerned that the optimism surrounding SDRs and other technical developments should not eclipse the practical realities and limitations of current technology, and that the Commission's spectrum allocation and policy development should continue with adequate consideration of both the potential benefits and potential consequences. The PSWN Program therefore concurs with API in cautioning against creating a "free-for-all" approach to spectrum allocation, noting that the Commission must continue to ensure the absence of interference with public safety radios above all other considerations.¹³ The PSWN Program similarly agrees with Motorola that the Commission must be sensitive to interference issues before considering spectrum allocation and that regulatory changes and technical agreements would need to be developed and implemented before any dynamic redistribution is undertaken.¹⁴

V. EQUIPMENT APPROVAL PROCESS

8. As with policy and allocation issues, the PSWN Program is also mindful that a number of factors must be carefully balanced in the area of equipment approval and type acceptance, noting the significant potential for both intentional and unintentional harm evident in the SDR's anticipated range and versatility. The PSWN Program, as did APCO, questions how the Commission would verify that SDR software is not modified to include unauthorized frequencies.¹⁵ The PSWN Program concurs with NTIA that, although interference issues are largely controlled by type acceptance, next-generation Software Radios will potentially have the capacity to be reconfigured by a software download. Such downloads have control and regulatory implications, especially pertaining to subsequent downloads and changes to the

¹² BellSouth Comments, Att. B at p. 11.

¹³ API Comments at p. 4.

¹⁴ Motorola Comments at p. 30-31.

¹⁵ APCO Comments at p. 3.

original software. The PSWN Program joins the NTIA in recommending that the Commission, in conjunction with industry and the SDR Forum, consider developing a configuration management process.¹⁶

VI. CONCLUSION

9. The PSWN Program shares the enthusiasm of the Commission, as well as many members of the public safety community, vendors, and commercial entities, that SDRs may eventually offer significant enhancements to the scope and quality of wireless communications services. In terms of the PSWN Program's mission to foster interoperability throughout the Nation, the potential of SDRs to both increase individual system capacities and bridge critical gaps between diverse spectrum bands is of particular interest. However, the PSWN Program cautions the Commission that any future benefits must be predicated on adequate development and responsible allocation and regulatory developments, as well as diligent equipment evaluation and approval methodology. Only after appropriate policy for SDR use and management has been implemented can SDRs deliver the benefits touted by their proponents to the public safety community.

Respectfully submitted,



Brigadier General Paul H. Wieck II
Iowa Army National Guard
Chair, PSWN Executive Committee
Spectrum Working Group

¹⁶ NTIA Comments at p. 23.

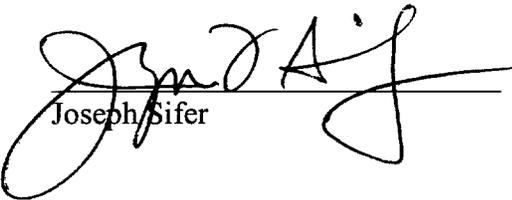
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CERTIFICATE OF SERVICE

I, Joseph Sifer, Senior Associate, Booz-Allen & Hamilton, Inc., 8283 Greensboro Drive, McLean, Virginia, 22102-3838, hereby certify that on this date I caused to be served, by first-class mail, postage prepaid (or by hand where noted) copies of the Public Safety Wireless Network's Reply Comments in response to comments filed by other parties regarding the Commission's Notice of Proposed Rulemaking, *In the Matter of Inquiry Regarding Software Defined Radios*, the original of which is filed herewith and upon the parties identified on the attached service list.

DATED at Fair Oaks, Virginia this 17th day of July 2000.



Joseph Sifer

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