

ORIGINAL

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of )  
)  
Amendment of the Commission's Rules to ) GN Docket No. 96-228  
Establish Part 27, the Wireless )  
Communications Service ("WCS") )

DOCKETED FOR ORIGINAL

**OPPOSITION TO PETITION FOR EXPEDITED RECONSIDERATION**

American Mobile Radio Corporation ("AMRC") hereby urges the Commission to dismiss the Petition for Expedited Reconsideration filed by PACS Providers Forum ("PPF") and DigiVox Corporation ("DigiVox") (collectively, the "Petitioners). AMRC is one of four applicants seeking authority to operate a satellite Digital Audio Radio Service ("DARS") system.

The Petitioners urge the Commission to reconsider its recently adopted Report and Order in the above-captioned Wireless Communication Service ("WCS") proceeding.<sup>1/</sup> Specifically, the Petitioners ask that the Commission reconsider the out-of-band emission limits determined appropriate for WCS operators. Under the Order, all emissions from WCS fixed transmitters in the 2305-2320 and 2345-2360 MHz bands must be attenuated below the transmitter power (p) by at least  $80 + 10 \log (p)$  dB, and all emissions from WCS mobile transmitters in the same bands must be attenuated at least  $110 + 10 \log (p)$  dB within the 2320-2345 MHz band, the portion of the spectrum allocated to DARS.

The Commission should uphold this standard and dismiss the Petition. In making its decision, the Commission had complete access to the full record in the WCS proceeding. The

<sup>1/</sup> Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, Report and Order, GN Docket No. 96-228 (adopted and released February 19, 1997) ("WCS Order").

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Petitioners present no evidence that the Commission failed to consider their filings, or the filings of any other party. While the out-of-band emission limits required by the Order are greater than those proposed by the Commission in its Notice of Proposed Rule Making last year, this modification resulted not from the exclusion of evidence, but from the Commission's full consideration of new materials submitted by various parties after the release of that proposal. In light of all the evidence, the Commission recognized in its Order that "the WCS out-of-band limits proposed in the NPRM would be insufficient to protect certain sensitive operations on adjacent frequencies . . .," and that the more restrictive attenuation standard established by its order ". . . is required in order to adequately protect satellite DARS reception from WCS transmission." WCS Order at ¶¶ 136, 138.

Moreover, in their Petition, PPF and DigiVox fail to provide any convincing evidence that their own proposed out-of-band emission standard would not substantially interfere with DARS operations.<sup>2f</sup> Not only is the support they provide not new, it is also based on numerous questionable or erroneous assumptions, all of which have the effect of minimizing the resulting level of interference. As shown in the attached Technical Statement of AMRC Senior Scientist

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<sup>2f</sup> The Petitioners propose the following out-of-band emission standard:

- subscriber unit transmit emission levels of  $81 + 10 \log (p)$  dB
- base station transmit emission levels of  $75 + 10 \log (p)$  dB

for technical operations that meet the following criteria:

- a 12.5% handset duty cycle with 312.5 msec pulse every 2.5 msec
- SU transmit power of 200 milliwatts
- RP transmit power of 800 milliwatts for RP at 25' height
- linear polarization
- only fixed (wireless local loop) and portable service may be provided (i.e., no vehicle-mounted units are permitted).

Richard O. Evans, the Petitioners' claims with respect to the effects of polarization loss, the PACS 12.5% duty cycle, and the absorption of energy by the human head should be discounted. In addition, as explained in the Technical Statement, the Petitioners' assertions regarding the supposed improbability of the close proximity of WCS and DARS receivers are of questionable validity. The Petitioners' estimates fail to account for the variability and imprecision of key statistical parameters, and appear rife with overoptimistic assumptions and approximations. In addition, the Petitioners do not present information needed to confirm or refute the details of their analysis.

The Petitioners' proposed standard would substantially harm the quality of service provided by DARS operators, and would undermine the regulatory stability so necessary to the success of this new service. In contrast, the Commission's out-of-band emission limits are the product of a careful and comprehensive analysis of the potential for interference in the DARS spectrum bands. There is no evidence that this standard should now be changed, and, accordingly, the Commission should dismiss the Petition.

Respectfully submitted,

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Dated: March 21, 1997

## TECHNICAL STATEMENT

In its exhibits to the Petition, Hughes Network Systems (HNS) presents an analysis of potential interference from their PACS transceivers into an SDARS receiver. While time constraints precluded an exhaustive examination of this material, it is clear that several of the assumptions used in the analysis are unduly optimistic.

First, the use of handset transmit duty cycle of 12.5% to reduce the effect of interference by 9.0 dB is not appropriate in this analysis. In a case where interference from PACS emissions at a given level causes severe interference, an SDARS receiver will suffer the loss of 12.5% of its received information rate. Use of duty cycle to reduce effective interference is appropriate in a case where interference results from the composite interference of a large number of transceivers with a random distribution of transmit start time. In this case, it is necessary to analyze the effect of a single PACS receiver, and no interference reduction is obtained from the duty cycle.

Second, the attenuation of the transmitted signal resulting from energy absorption by the human head will vary widely, and can be zero in a range of directions from the side of the head where the transceiver is held. Again, since a single unit can cause interference, no benefit is obtained from having a number of units with a distribution of orientations. Certainly, the assumption should be 0.0 dB, rather than the 5.0 dB assumed by HNS.

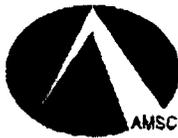
Third, the polarization loss assumed is optimistic. While 3.0 dB of isolation between linear and circular polarizations can be obtained in the main beam of the antenna, the analysis presented is for a side lobe. In an antenna side lobe, polarization isolation is much less than in the main beam, and should not be counted on. HNS underestimates interference from the PACS base transmitter as well. While isolation from base antenna directivity may be 20 dB directly below the antenna, HNS has not demonstrated that directly below the antenna is the worst case

location for interference. The radiation pattern from a dipole antenna is quite broad. At 60 degrees away from the minimum, the pattern is near the maximum, while separation distance has increased only from the assumed 24 feet to 48 feet. Doubling the separation increases path loss by 6 dB, but the antenna directivity has dropped by 20 dB, for a net increase in interference of 14 dB.

Also, in Exhibit C to the Petition, an analysis by Dr. Ronald M. Harstad is presented.

As Dr Harstad states, “. . . [h]ow rarely WCS handsets might interfere, and how brief any interferences might be, depends upon about three dozen parameters . . .” Exhibit C at 1. Many of these parameters cannot be known with any precision, and assumptions or approximations must be made. One assumption appears to be that SDARS equipped vehicles would be within interference range of PACS users only briefly while passing them. This assumption appears to be unreasonable, since vehicles can remain side-by-side for relatively long periods of time, even in moderate traffic. Further, the information needed to confirm or refute the details of the analysis were not provided. No justification is provided for the range of values chosen for the parameters, and the analysis algorithm is not described.

Dr. Harstad also assumes, without justification, that 12 feet is sufficient isolation to prevent interference without justifying that assumption. He argues that “[i]f this number were way off, and a 15 foot difference from WCS handset to SDARS antenna were needed to ensure no interference, none of the results decrease by an order of magnitude.” Exhibit C at 4. The realities of radio propagation are that the difference in loss between 12 and 15 feet of physical separation are small, about 1.0 dB, and that much greater separation may be needed. Certainly, multiplying the distance by some value to increase isolation will significantly change the result.



**American Mobile Satellite Corporation**

TECHNICAL CERTIFICATE

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information in the foregoing technical statement ; that I am familiar with Part 25 of the Commission's Rules and Regulations; and that I have reviewed the engineering information in the foregoing pleading, and that it is complete and accurate to the best of my knowledge and belief.

By: Richard O. Evans  
Richard O. Evans  
Senior Scientist  
AMRC

Date: March 21, 1996

**CERTIFICATE OF SERVICE**

I, Elinor W. McCormick, a secretary to the law firm of Fisher Wayland Cooper Leader & Zaragoza L.L.P., hereby certify that a copy of the foregoing **“OPPOSITION TO PETITION FOR EXPEDITED RECONSIDERATION”** of DigiVox Corporation and the PACS Providers Forum was sent this 21st day of March, 1997, via hand delivery to the following:

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