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

In the Matter of

Amendment of Section 2.106 of
the Commission's Rules to
Allocate Spectrum for
Wind Profiler Radar Systems

E.T. Docket No. 93-59

RM-8092

REPLY COMMENTS OF HUGHES AIRCRAFT COMPANY

Hughes Aircraft Company ("Hughes") hereby replies to comments filed in response to the Commission's Notice of Proposed Rulemaking and Notice of Inquiry in the above-captioned proceeding, 8 FCC Rcd. 2546 (April 1, 1993) (the "Notice"). As it did in its comments upon the Notice, filed June 15, 1993 ("Hughes Comments"), Hughes confines this reply to the subject matter of the Notice of Inquiry section of the Notice, which addresses Radian Corporation's ("Radian") Petition for Rulemaking filed August 13, 1992, as modified by Reply Comments filed December 17, 1992 (collectively, the "Radian Petition"). In its petition, Radian asked the Commission to allocate 908.75-921.25 MHz on a co-secondary basis for use in wind profiler radar systems ("WPRS").

As stated in its comments, Hughes opposes allocation of 908.75-921.25 MHz for WPRS use. In addition to the services already authorized to use portions of the 902-928 MHz band requested by Radian, the Commission has recently proposed expanding the existing authorization for location and monitoring services ("LMS"), also known as automatic vehicle monitoring, to include the entire 902-928 MHz band. See

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Notice of Proposed Rulemaking for Amendment of Part 90 of the Commission's Rules, 8 FCC Rcd. 2502 (April 9, 1993) (the "LMS NPRM").^{1/} Radian has repeatedly failed to adequately address how WPRS will successfully co-exist with these services.

Like a number of other commenters, Hughes' initial comments demonstrated that there is a likelihood of interference between WPRS and other services using 902-928 MHz, particularly LMS systems operating at 912-918 MHz. Radian, in its comments in this proceeding ("Radian Comments") and its comments in response to the LMS NPRM ("Radian LMS Comments")^{2/} argues against such concerns, and yet still has provided almost no technical information to rebut or answer Hughes' concerns regarding the potential for harmful interference. Nor has Radian demonstrated how coordination with other users of the spectrum in question can be accomplished. Further, neither Radian, nor any of the commenters supporting Radian's proposal, has demonstrated that the need for WPRS operating at 908.75-921.25 MHz is sufficient to overcome the risk of interference with established uses of the band, many of which represent significant investment and widespread use by the public. The Commission has gone to great lengths to give Radian repeated opportunities to provide basic information needed to evaluate its proposals. Radian's continued failure to do so means that its petition should be denied.

^{1/} The Commission has stated that it intends to consider action taken in the LMS docket in its

DISCUSSION

I. **Radian Again Has Failed to Adequately Demonstrate WPRS Will Not Cause Interference to Other Users of the Requested Spectrum**

In its Petition, Radian seeks to have the Commission allocate to WPRS a portion of the spectrum already used in a variety of services and equipment, including: LMS, government radiolocation, amateur radio services, industrial, scientific and medical ("ISM") equipment, and unlicensed devices operating under Part 15 of the Commission's rules. See Notice at 2548. Licensees, operators and developers of these existing services, including Hughes, have raised serious concerns in this proceeding about the likelihood for harmful interference caused by WPRS.^{3/} As the party requesting a new allocation, Radian must either make available the results of compatibility tests between WPRS and other existing services, or provide technical data about WPRS in sufficient detail for other users, and the Commission, to make such an evaluation. See Notice at 2549 (Commission noting that record, based on Radian Petition, was inadequate to determine effects on other services). Despite repeated opportunities to do so, Radian has not met that burden.

Radian's showing consists of its assertion that, because WPRS signals are radiated in the vertical direction, it is "simple and obvious" that interference with adjacent co-channel users is unlikely. Radian Comments at 10, Radian LMS Comments at 10.

^{3/} E.g., LMS commenters: Hughes, Pinpoint Communications, North American Teletrac and Location Technologies, Mark IV IVHS Division; amateur radio commenters: American Radio Relay League, Inc., Technology Radio Amateur Club; Part 15 commenters: Utilities Telecommunications Council, Southern California Gas Company, Metricom, Inc., EnScan, Inc., Telecommunications Industry Association, and Symbol Technologies, Inc.

This is hardly sufficient. The view fails to address the very real likelihood of side lobe interference to other authorized users of the band, even taking into account the effects of proposed fences around WPRS installations. For example, Radian has failed to provide horizontal antenna patterns and beam widths, or to address suppression requirements at off-axis angles above the horizontal.^{4/}

In its suggested service rules for WPRS, Radian proposes a peak power limit of 500 watts, with side lobe suppression of at least 45 dB. Radian Comments at 12.^{5/} As pointed out by Metricom, Inc., with the antenna gain of +29 dBi, the main lobe EIRP can be as high as +86 dBm. Comments of Metricom, Inc. at 4-5. See also Comments of Pinpoint Communications at 8. Accordingly, side lobe EIRP can be as high as +41 dBm, or over 10 watts, even after the attenuating effects of suppression fencing or other safeguards.

Many of the existing uses of the 902-928 MHz band, such as Part 15 devices and vehicle-mounted transponders used in LMS systems, operate at less than 10 watts and can suffer serious degradation in performance if WPRS is allowed to operate as proposed. The probability of harmful interference is heightened by Radian's plans to make WPRS systems mobile, making coordination difficult and requiring additional FCC

^{4/} Off-axis protection from interference is required for reception points of LMS or other services that may be at elevations above the horizon.

^{5/} Hughes notes that proposed rule Section 90.248(e)(1)(ii) of Radian's Erratum to Reply Comments, filed December 18, 1992, appears to permit a 500 kilowatt EIRP in the horizontal direction, toward other terrestrial users of the band. Hughes assumes that the word "horizontal" was included in that section inadvertently and that the 500 kilowatt limit is the limit on maximum antenna gain in any direction. Otherwise, WPRS hardly represents the "low power" system described by Radian.

resources, and to operate WPRS systems in heavily populated areas, where numbers of LMS systems and other co-channel users will be high.^{6/}

Radian has never adequately addressed the issue of WPRS susceptibility to interference by other licensed and unlicensed services. For example, the Part 15 Coalition has identified the potential for very high penetration of new 1 Watt (4 Watt EIRP) cordless telephones. See Comments of the Part 15 Coalition on LMS NPRM at 16-17. Before the Commission can devote resources to authorizing and licensing WPRS, Radian has an obligation to demonstrate that WPRS can successfully withstand the potential for interference posed by LMS, cordless telephones and other new technologies entering the marketplace. Radian cannot simply rely on the compatibility of WPRS with current uses of 908.25-921.25 MHz.

Finally, Radian's claims that interference is unlikely due to a lack of complaints arising out of past WPRS operations is without merit. Radian Comments at 9-10, Radian LMS Comments at 11-12. If Radian's proposal and the frequency allocations proposed in the LMS NPRM are adopted, demand for 900 MHz spectrum will increase dramatically. In view of the major investments in the band already made by authorized users such as LMS and Part 15 device manufacturers, the Commission cannot

^{6/} In its comments supporting the Radian Petition, the National Oceanic and Atmospheric Administration's National Environmental Satellite, Data and Information Service ("NOAA") argues that interference with most other uses is not a concern because these tend to be concentrated in urban areas, and WPRS systems will be located in rural areas. Comments of NOAA at 9. NOAA cautions that the potential for interference with LMS systems, which may be located in rural areas as well, is greater, and "should be carefully studied." Id. However, Radian emphasizes that WPRS systems can operate in heavily populated urban centers. Radian Comments at 9-10, Radian LMS Comments at 11. Accordingly, NOAA's concerns regarding interference in rural areas apply to urban services as well.

open the band to WPRS on the basis only of the lack of interference complaints arising out of isolated, experimental deployment of WPRS in the past.

II. Radian Has Not Demonstrated the Need to Use 908.75-921.25 MHz for WPRS

Radian, and its government clients, assert that high frequency WPRS is useful in low-altitude air quality studies. Radian Comments at 6, Comments of NOAA at 7. NOAA further notes that, because the government is developing a wind profiling capability at 915 MHz, it considers it "reasonable" that the private sector have a similar capability, especially because 915 MHz WPRS devices will be more transportable and less expensive than those operating at 449 MHz. Comments of NOAA at 7.

While Hughes agrees that WPRS serves an important function, the 900 MHz band is the wrong "home" for the service; it's a band that already accommodates a number of other private sector uses. This is especially true in light of the serious problems regarding interference resulting from WPRS, discussed above, and the availability of 449 MHz for wind profiling operations.

Radian has compounded its failure to demonstrate that its proposal will not result in interference by also failing to show that low-altitude air quality measurements can only be accomplished using WPRS systems operating in the 900 MHz band, or that no other available spectrum can be used. Radian simply has not shown that such WPRS use of the spectrum in question is so essential that the Commission should risk interference to numerous other systems that are already authorized to provide service to the public.

CONCLUSION

Despite the history of questions raised by the Commission and by interested parties about the compatibility with other services of WPRS operations in the 902-928 MHz band, and about the need for such operations, Radian has failed to meet its burden. Although Radian has had ample opportunities to respond to questions about its WPRS proposal, neither the Radian Comments nor the Radian LMS Comments adds significantly to the information contained in the original Radian Petition, which the Commission recognized as inadequate to make the case. Accordingly, Hughes strongly urges the Commission to deny the Radian Petition for a rulemaking to allocate 908.75-921.25 MHz for WPRS.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing REPLY COMMENTS OF HUGHES AIRCRAFT COMPANY has been served by United States mail, postage prepaid this 15th day of July, 1993 upon the following:

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