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SUSAN ROSENAU
ADMITTED IN D.C. ONLY

December 18, 1992

Our File No.
1049-101-63

Ms. Donna R. Searcy
Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: RM No. 8092
Request for Allocation of frequencies in the 915 MHz Band for the Co-Secondary Use of Wind Profiler Radar Systems

Dear Ms. Searcy:

Submitted herewith on behalf of Radian Corporation, is the **ERRATUM TO REPLY COMMENTS AND AMENDED PETITION FOR RULE MAKING** in the above-referenced matter. Enclosed are an original and nine copies, a copy for each of the Commissioners. All parties are being hand-served with this Erratum and accompanying materials.

If there are any questions concerning this matter, please communicate directly with this office.

Respectfully submitted,

RADIAN CORPORATION

Susan H. Rosenau
Its Attorney

SHR/cp

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List A B C D E

Before The

Federal Communications Commission

Washington, D.C. 20554

In The Matter Of	)	
	)	
Request for Allocation of Two MHz in the 915 MHz Band for the Co-Secondary Use of Wind Profiler Radar Systems	)	RM No. 8092

TO: The Commission

ERRATUM TO REPLY COMMENTS AND AMENDED PETITION FOR RULE MAKING

Radian Corporation ("Radian"), by its attorneys, respectfully submits this Erratum to its Reply Comments and Amended Petition for Rule Making filed yesterday, December 17, 1992. The corrections contained herein are:

1) Page 9, first full paragraph, second sentence. Change "77 dBm" to "78 dBm." A copy of this page is submitted and should be associated with the pleading.

2) Submission of Appendix A, Engineering Statement of John Neuschaefer. The signed facsimile copy of the Engineering Statement did not arrive in time for incorporation with the document yesterday.

3) Corrected Exhibit B, Proposed Rule, Number 5), proposed new Section 90.248(b). That subsection should read:

(b) The use of P0N is authorized for operation of transmitters in wind profiler radar systems subject to this section. Emission designator MXN may also be used to designate the use of bi-phase complementary phase coding using cell lengths of 400, 700, 1400 or 2800 NS and 2, 4, 8, 10, or 16 cells.

Radian hereby submits a new Appendix B reflecting these changes.

Radian is hand serving all interested parties today with this Erratum and submits that no party will be prejudiced by its acceptance.

Respectfully submitted,

Radian Corporation

James E. Dunstan
Susan H. Rosenau

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December 18, 1992

CERTIFICATE OF SERVICE

The undersigned, an employee of Haley, Bader & Potts, hereby certifies that the foregoing document was hand served this date by First Class U.S. Mail, postage prepaid, to the following:

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December 18, 1992

APPENDIX A

ENGINEERING STATEMENT OF JOHN NEUSCHAEFER

1. I am a Staff Engineer at Radian Corporation ("Radian"). I have been involved in research and development of wind profiling radars beginning in 1979. I have worked for Radian Corporation since 1990, designing remote sensing instruments. I was one of the founders of Tycho Technology in 1979 (Tycho was closed in 1990). I was a research and development engineer and then, manager of RF systems at Tycho. Before that, I designed and built radio astronomy and lightning research instruments at the University of Colorado. I have extensive experience in RF systems design and projects management.

2. At Radian, I am the lead engineer for wind profiler development. I am a member of the engineering review board established for the wind profilers under the Cooperative Research and Development Agreement (CRDA) with the National Oceanic and Atmospheric Administration (NOAA).

3. I have reviewed the opposition and comments filed in FCC RM 8092 by EnScan, Inc. ("EnScan"), Telxon Corporation ("Telxon"), the American Radio Relay League, Inc. ("ARRL"), and AMTECH Corporation ("AMTECH").

4. Radian has operated 915 MHz Wind Profilers since 1989, and has received licenses for such from the FCC on an experimental basis. In my experience with Radian, and in reviewing our files, we have found one instance in which the over 20 systems Radian has operated have ever received any complaints from users in the 915 MHz band. In that one complaint, we found that an inexperienced installer failed to perform an adequate pre-installation site survey for an experiment near Houston. Radian reconfigured the profiler operation to eliminate the problem. Other operations include experiments at Los Angeles International Airport (LAX) and sites in diverse locations in New York, California, Texas, Michigan, Alabama, Tennessee, Florida, Georgia, Idaho, Utah, Colorado and Oklahoma.

5. I am very familiar with the operations of similar 915 MHz Wind Profilers by the National Oceanic and Atmospheric Administration ("NOAA"). Radian entered into a Cooperative Research and Development Agreement ("CRDA") with NOAA in

1991 and has worked closely with NOAA since that time. Radian is unaware of any complaints of interference lodged against NOAA in the operation of its 915 MHz Wind Profiler systems, including one that has been operated at Denver's Stapleton Airport since 1981.

6. 915 MHz Wind Profilers are necessary to fill an unmet need for environmental measurements. The government originally selected 915 MHz as a trade off between system feasibility and antenna size and atmospheric turbulence scales that are the "reflective" mechanism for wind profilers. For boundary layer or lower atmospheric profilers, high resolution measurements with altitude coverage only up to a few kilometers above ground are required. Since wind profilers require relatively narrow antenna beamwidths, the 915 MHz frequency was the ideal compromise between the antenna's physical aperture, the cost, and the height coverage.

7. The boundary layer profiler is of use to a wide range of environmental programs. Radian is currently under contract with many environmental agencies such as EPA, Houston Regional Monitoring (HRM) Corporation, Texas Air Control Board, South Coast Air Quality Management District, and private firms intent on improving air quality for all citizens. Many of the 80 EPA severe ozone non-attainment areas in the U.S. could utilize these systems to help comply with the Clean Air Act Amendments of 1990. 915 MHz Wind Profilers are also being used internationally in many locations.

8. I have reviewed the Engineering Statement of John W. MacConnell attached to EnScan's Opposition. Enscan's Opposition and its supporting Engineering Statement are technically incomplete and based on several false assumptions. EnScan claims that "one of the principal uses for wind profiler radar systems is to detect wind shear in the vicinity of airports." EnScan Opposition, p. 4. Radian operates no 915 MHz systems currently utilized for wind shear detection. Indeed, the Federal Aviation Administration ("FAA") is supporting NEXRAD and Terminal Doppler Weather Radars for wind shear detection, not wind profilers. EnScan also refers to potential interference to SARSAT satellites. EnScan Opposition, p. 5. Since SARSAT satellites operate at 400 MHz, there is no chance that Radian's 915 MHz system will interfere with them. Radian

is aware of no satellite users of the 915 MHz band that could be impacted by Radian's operation.

9. EnScan's Engineering Statement contains factual errors and unwarranted conclusions.

The analysis uses a value of 35 dB antenna system gain. This would require a planar antenna more than 6 meters by 6 meters square (much larger than any proposed). The largest antenna system Radian will use is 2.6 meters by 2.6 meters. Measurement by Ball Aerospace of the individual 0.9 x 0.9 meter antenna panels used in the array resulted in a gain value of ~19.5 dB. This would result in an antenna system gain for the largest proposed configuration of ~29 dB.

The analysis ignores the impact of the pulse used in the doppler wind profiler. The maximum peak power is +57 dBm. Because the maximum duty cycle of the transmission is 15%, the maximum average output power is +49 dBm. Thus the average EIRP is 78 dBm (rather than 92 dBm as stated in the Enscan analysis).

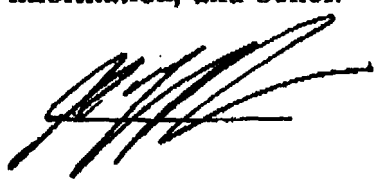
The profiler center frequency is 915 MHz. Because energy of the transmitted pulse is dispersed in the spectrum (width determined by the pulse width), the frequency of operation, input sensitivity and receiver input bandwidth of the Enscan equipment are necessary to evaluate any interference potential.

The Enscan analysis ignores any effect from range. It is unlikely that the two systems would be co-located. Range effects must be considered since the signal level falls off as the square of the distance.

In order to properly evaluate any potential interference, a great deal more information is required regarding the Enscan equipment. Specific information regarding range and elevation (relative to the profiler), antenna gain and pattern, receiver sensitivity, receiver bandwidth, and center frequency will allow determination of detectability of the profiler operation by the Enscan systems. Detail about the method of data transmission used by Enscan is required to evaluate potential interference with their system. Alternatively, the systems could be field tested together.

The engineering evaluation by Enscan does not contain enough information to indicate interference is likely.

10. ARRP and AMTECH raise similar interference questions. Both extrapolate their interference claims from the interference caused by 400 MHz Wind Profilers which operate at 50,000 watts. Radian's system operates at 1/100 the power -- 500 watts. Further, 400 MHz Wind Profilers do not use sidelobe suppression fences, as does Radian. Ten years of operational experience indicate that 915 MHz Wind Profilers can co-exist with other users in this band. I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information, and belief.



Date: December 16, 1992

APPENDIX B

APPENDIX B
Proposed Rule for Wind Profiler Service

Amend 47 C.F.R Part 90 As Follows:

1) By amending 47 C.F.R. § 209 to add a new subjection (b)(10) which reads:

> The maximum authorized bandwidth for wind profiler radar system was authorized under this part is 12.5 MHz in the frequency range 908.75 - 921.25.

2) By amending 47 C.F.R. § 213 to include in the frequency tolerance chart the following line item:

Frequency Range	Over 200 W output power
908.75 to 921.25	+.00001

3) By amending 47 C.F.R. § 231 as follows:

by inserting the language underlined below:

"This subpart sets forth requirements and standards for licensing and operation of non-voice and other specialized radio uses (other than radiolocation). Such uses include secondary signaling, telemetry, radioteleprinter, radiofacsimile, authorities vehicle monitoring (AVM), radio call box relay, vehicular repeater, wind profiler radar operations, and control station operations."

4) By amending 47 C.F.R. § 233(c) as follows:

by inserting the language underlined below:

"Provisions of this section do not apply to authorizations for paging, telemetry, radiolocation, AVM, radioteleprinter, radio call box operations, wind profiler radar operations, or authorizations granted pursuant to subpart T of this part."

5) By adding new Section 90.248 as follows:

Section 90.248 Wind Profiler Radar Operations

(a) These provisions authorize, to persons eligible in the radio services of this part, the licensing of wind profiler radar systems that utilize non-voice radio techniques to sample the lower atmosphere for wind changes, particulate transportation, and ozone levels.

(b) The use of P0N is authorized for operation of transmitters in wind profiler radar systems subject to this section. Emission designator MXN may also be used to designate the use of bi-phase complementary phase coding using cell lengths of 400, 700, 1400 or 2800 NS and 2, 4, 8, 10, or 16 cells.

(c) Frequencies for wind profiler radar systems are assignable on a secondary basis in the 908.75-921.25 MHz band provided that operations will not cause interference to and can tolerate interference from government stations which operate in these bands and industrial, scientific, and medical (ISM) devices licensed under this part.

(d) Each application to license an wind profiler radar system shall including the following supplemental information:

(i) A detailed description of the manner in which the system will operate, including a map or diagram.

(e) *Technical Standards.*

(1) Wind profiler radar systems authorized for operation will be permissible provided that:

(i) The peak output power of transmitter shall not exceed 500 watts.
(ii) Antenna gain shall not exceed 30 dBi in any horizontal direction.
(iii) Side lobe suppression devices such as fences shall be employed at all site such that the horizontal side lobe is attenuated at least 45 dB below peak operating power.

(f) Wind profiler radar stations are exempted from the identification requirements of § 90.425; however, the Commission may impose automatic station identification requirements when determined to be necessary for monitoring and enforcement purposes.

(g) *Investigation and Elimination of harmful interference.* The operator of a wind profiler radar station that causes harmful interference to ISM equipment or other primary licensed users shall promptly take appropriate measures to correct the problem.

(i) If the operator of a wind profiler radar station is notified by the Commission's Engineer in Charge (EIC) that operation of such equipment is endangering the functioning of a radionavigation or safety service, the operator shall immediately cease operating the equipment. Operation may be resumed on a temporary basis only for the purpose of eliminating the harmful interference. Operation may be resumed on a regular basis only after the harmful interference has been eliminated and approved from the EIC obtained.

(ii) When notified by the EIC that a particular station is causing harmful interference, the operator shall arrange for an engineer skilled in techniques of interference measurement and control to make an investigation to ensure that the harmful interference has been eliminated. The IC may require the engineer making the investigation to furnish proof of his or her qualifications.

(iii) An interim report on investigations and corrective measure taken pursuant to this subsection shall be filed with the EIC of the local FCC office within 30 days of notification of harmful interference. The final report shall be filed with the EIC within 50 days of notification. The date for filing the final report may be extended by the EIC when additional time is required to put into effect the corrective measures or to complete the investigation. The request for extension of time shall be accompanied by a progress report showing what has been accomplished to date.