

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

In the Matter of)	
)	
Request for Further Comment on Selected)	IB Docket No. 95-91
Issues Regarding Satellite Digital Audio)	RM No. 8610
Radio Service Terrestrial Repeater)	DA No. 01-2570
Networks)	

REPLY COMMENTS OF XM RADIO INC.

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December 21, 2001

Summary

In only three months of service, XM Radio's satellite Digital Audio Radio Service ("DARS") has proven to be a great success. Not only has XM Radio enjoyed customer satisfaction, it has won "Product of the Year" and "Invention of the Year" awards from publications such as Fortune Magazine, Time Magazine, and Popular Science. DARS is truly revolutionizing radio as we know it. The Commission is to be commended for its vision in allocating spectrum to DARS in 1995 and issuing licenses in 1997.

A group of WCS licensees seeks to spoil this success with speculative claims regarding interference to facilities that do not exist. Unlike XM Radio, the WCS licensees are (including the well-financed companies that participated in this proceeding) not using their licensed spectrum, are not offering any value to the public, and have no firm plans to do so any time soon. Their proposal – to freeze deployment of higher power repeaters and require DARS licensees to reduce the power of their repeaters to 2 kW by 2006 – is completely unnecessary and would have a devastating impact on the DARS licensees and the valuable services they provide to the public.

The two DARS licensees are in total agreement on two critical modifications to the proposal in the Public Notice: (i) there should be no freeze on the deployment of higher power repeaters; a freeze would be devastating to the DARS industry and consumers while affording no benefit to the WCS industry; and (ii) the Commission should calculate the power of a repeater by averaging the power over 360 degrees.

Regarding the safe harbor/liability zone concept proposed in the Public Notice, the WCS licensees clamor that it does not propose sufficient compensation for WCS licensees, yet given the record in this proceeding it is a wonder the Commission is considering any compensation for WCS licensees. The WCS licensees' concerns are completely speculative, were late filed, and

can be solved using simple means that other Commission licensees, including XM Radio and Sirius, have used. There is a sufficient record on which the Commission could decide to not only limit compensation to WCS licensees, but to provide no compensation to WCS licensees at all. For that reason, XM Radio also supports Sirius's proposal to drop the safe harbor/liability zone concept in total and instead apply only a power cap of 18 kW EIRP (averaged over 360 degrees) or, alternatively, apply a number cap, allowing DARS licensees to operate a maximum of 155 repeaters operating with an EIRP greater than 2 kW (averaged over 360 degrees).

In the event the Commission does not adopt the approach of a power cap or number cap, XM Radio continues to urge the Commission to adopt the safe harbor/liability zone proposal with the following modifications proposed in our initial comments: (i) limit DARS licensees to compensate WCS licensees only for filters to remedy interference to WCS base stations and not for labor costs or to remedy interference to CPE; (ii) limit the compensation period to one year from the grant of the DARS STAs (*i.e.*, until September 17, 2002); (iii) require WCS licensees to share financial liability for filters with DARS licensees after January 1, 2002; (iv) limit the total liability of each DARS licensee for filters at no more than \$10,000 per WCS base station site and \$1 million total; and (v) place the burden on WCS licensees to demonstrate that blanketing interference from a DARS repeater prevents the provision of commercial service. The modified safe harbor/liability zone scheme will be entirely consistent with Commission policy and precedent, including the Commission's 1997 decision to impose a 2 kW power limit on WCS licensees. With respect to repeaters operating after the compensation period, MSV continues to urge the Commission to adopt a power cap of 18 kW, with power calculated by averaging over a full 360 degrees. If the Commission does not adopt averaging, then a power cap of 40 kW EIRP should be established.

XM Radio and Sirius demonstrated in their Comments that there is no reason for the Commission to extend to DARS licensees the WCS rule for protection of MDS/ITFS analog receivers. The two MDS/ITFS organizations that filed comments provided no evidence that interference to these old receivers from DARS repeaters is a problem.

The NAB's concerns with blanketing interference to Broadcast Auxiliary Service ("BAS") receivers from DARS repeaters are both untimely and unfounded. Given the receiver sensitivity figures provided by the NAB, the only time a DARS repeater could possibly cause interference to a BAS receiver would be if they were literally right next to one another, which would only occur if they were collocated on a tower or rooftop. Because this interference is unlikely to occur and, if it does, is usually handled through private negotiations, there is no reason for the Commission to adopt a rule to address it.

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REPLY COMMENTS OF XM RADIO INC.

XM Radio Inc. (“XM Radio”) hereby replies to the comments filed in the above-captioned proceeding concerning the Commission’s Public Notice requesting further comment regarding satellite DARS terrestrial repeaters.

Background

On November 1, 2001, the International Bureau issued a Public Notice requesting comment on final rules for the operation of satellite Digital Audio Radio Service (“DARS”) terrestrial repeaters.¹ The Commission proposes to allow DARS licensees to operate an unlimited number of lower power repeaters without prior coordination with other licensees. For higher power repeaters, the Commission proposes to freeze for eighteen months after the effective date of final rules any deployment beyond what was authorized in the grants of Special Temporary Authority (“STA”) issued to XM Radio and Sirius Satellite Radio Inc. (“Sirius”) in September 2001.² During this eighteen-month period, the Commission proposes to require

¹ “Request for Further Comment on Selected Issues Regarding the Authorization of Satellite Digital Audio Radio Service Terrestrial Repeater Networks,” *Public Notice*, Report No. SPB-176, IB Docket No. 95-91 (November 1, 2001).

² XM Radio Inc., *Order and Authorization*, File No. SAT-STA-20010712-00063, at ¶ 18 (Sept. 17, 2001) (“*XM STA Order*”); Sirius Satellite Radio Inc., *Order and Authorization*, File No. SAT-STA-20010712-00063, at ¶ 18 (Sept. 17, 2001) (“*Sirius STA Order*”).

DARS licensees to compensate WCS licensees for interference to WCS stations outside of a safe-harbor zone.

In response to the Public Notice, XM Radio supported the proposal to allow DARS licensees to deploy an unlimited number of lower power repeaters without coordination with other licensees.³ Regarding the proposal for higher power repeaters, XM Radio urged the Commission to adopt two principle clarifications: (i) to define higher and lower power repeaters using the same averaging technique used for MDS and ITFS transmitters; and (ii) to eliminate the proposed 18-month freeze on deployment of additional higher power repeaters. XM Radio at 8-12, 16-18. XM Radio also generally supported the proposed safe harbor/liability zone concept, but with certain clarifications and revisions, such as (i) limiting the DARS licensees' liability to WCS base stations and not consumer equipment, (ii) limiting the compensation period to one year from the grant of the DARS STAs (September 17, 2001), and (iii) limiting the total liability of each DARS licensee to no more than \$10,000 per WCS base station site and \$1 million total. XM Radio at 18-23. XM Radio noted that the safe harbor/liability zone concept was a significant concession on its part and that the proposed revisions were only fair considering that (i) WCS licensees have had notice since 1990 that DARS licensees were planning to operate higher power repeaters and failed to raise any objections until the last minute; (ii) WCS licensees are entirely speculative since, with few exceptions, they are warehousing their spectrum and real-world testing has indicated that there is no interference from DARS repeaters in the very few markets where WCS licensees are actually operating facilities; and (iii) WCS licensees can solve their own problem by eliminating their susceptibility to interference from DARS repeaters (as the DARS licensees have done to mitigate interference from one another) without adding

significant cost and without detracting from the quality of what service they may eventually provide. XM Radio at 18-20. With respect to Multipoint Distribution Service/Instructional Television Fixed Services (“MDS/ITFS”) licensees, XM Radio did not support the proposal to require DARS licensees to compensate MDS/ITFS licensees for interference to analog receivers. XM Radio at 25-26.

In its comments, Sirius Satellite Radio Inc. (“Sirius”), the other DARS licensee, also opposed the proposal to freeze the DARS licensees’ operation of repeaters.⁴ Like XM Radio, Sirius argued that the Commission should employ 360 degrees averaging in calculating the power level of repeaters. Sirius at 6-8. As to final rules, Sirius presented three options. Sirius’ preferred option would afford DARS licensees blanket authority to operate an unlimited number of repeaters, but power would be capped at 18 kW EIRP, with power averaged over 360 degrees. Sirius at 11-13. Under Sirius’s second choice, each DARS licensee would be limited to operating a maximum of 155 repeaters with an EIRP greater than 2 kW and power averaged over 360 degrees. Sirius at 13-14. Sirius’s last and least preferred option would entail a modified version of the safe harbor/liability zone concept as proposed in the Public Notice. Sirius at 14-17. Under Sirius’s proposal, the safe harbor and liability zone would be calculated using a constant WCS receiver overload sensitivity threshold of -35 dBm. With this threshold, the liability zone would be an area within a 2.2 mile radius from a repeater and the safe harbor would be an area within a .5 mile radius from a repeater. Sirius proposed the same one-year compensation period and liability limits as XM Radio proposed. Sirius at 19-20. Regarding

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³ Comments of XM Radio Inc., IB Docket No. 95-91, at 14 (“XM Radio”).

⁴ Comments of Sirius Satellite Radio Inc., IB Docket No. 95-91 (Dec. 14, 2001), at 8-11.

notice to WCS, MDS, and ITFS licensees, Sirius proposed that Commission require DARS licensees to publish location and technical parameters of repeaters with EIRP greater than 200 Watts on the Internet. Sirius at 22-23. Like XM Radio, Sirius argued that DARS licensees should not be required to compensate MDS/ITFS licensees for interference to old analog receivers. Sirius at 24-25.

Various WCS licensees filed joint comments objecting to the safe harbor/liability zone proposal and instead argued for a “sunset” proposal which would require DARS licensees to power down to 2 kW by December 31, 2006 at the latest.⁵ The WCS Coalition objected to the safe harbor/liability zone proposal because (i) the eighteen-month compensation period is too short considering that WCS licensees are still designing their networks (WCS Coalition at 14); (ii) it does not address intermodulation distortion (WCS Coalition at 10); (iii) it does not propose compensation for CPE (WCS Coalition at 12); (iv) it only addresses the cost of components and not the cost retrofitting existing equipment (WCS Coalition at 12); (v) the 2 kW safe harbor concept is flawed because the safe harbor are would be a “dead zone” if a 40 kW repeater is at the center (WCS Coalition at 12-13); and (vi) it places the burden on WCS licensees to prove that they are suffering blanketing interference and that they cannot provide commercial service (WCS Coalition at 13). The WCS Coalition also argued that the proposal is inconsistent with the Commission’s 1997 decision to impose a 2 kW power cap on WCS licensees to protect MDS/ITFS licensees. WCS Coalition at 6-8. In addition, the WCS Coalition contended that the DARS licensee’s deployed a nationwide repeater network at their own risk based on an

⁵ Joint Comments of AT&T Wireless Services, Inc. (“AWS”), BeamReach Networks Inc. (“BeamReach”), BellSouth Corporation (“BellSouth”), Metricom, Inc. (“Metricom”), Verizon Wireless, Inc. (“Verizon”), WorldCom, Inc. (“WorldCom”), Wireless
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experimental authorization and now seek to use this existing network to force the Commission into authorizing high power repeaters. WCS Coalition at 9-10. Finally, they argued that any rule that would constrain use of WCS spectrum would deter participation in future auctions. WCS Coalition at 5-6.

WCA and the National ITFS Association urged the Commission to adopt the proposal to require DARS licensees to comply with the same rule applicable to WCS licensees for compensation of MDS/ITFS licensees for interference to old analog receivers.⁶ WCA also mentioned in a footnote that the Commission must consider the impact of high power DARS repeaters on the nearby 2150-2162 MHz and 2385-2400 MHz bands, which are being considered for 3G wireless use or for relocation of displaced licensees. WCA at 1 n.2.

The National Association of Broadcasters and some radio stations urged the Commission to explicitly prohibit local origination of programming.⁷ They argued that the language in the Public Notice proposing a requirement that a DARS satellite signal and repeater signal be received “nearly simultaneously” by DARS subscriber receivers is too vague and does not prohibit local origination or storing of programming at a repeater. NAB at 5. In addition, the NAB expressed for the first time a concern with blanketing interference from DARS repeaters to

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Communications Association International, Inc. (“WCA”), IB Docket No. 95-91 (Dec. 14, 2001), at 18-21 (“WCS Coalition”).

⁶ Comments of Wireless Communications Association International, Inc. (“WCA”), IB Docket No. 95-91 (Dec. 14, 2001), at 2-3; Comments of National ITFS Association, IB Docket No. 95-91 (Dec. 14, 2001), at 2.

⁷ Comments of the National Association of Broadcasters (“NAB”), IB Docket No. 95-91 (Dec. 14, 2001); Comments of KRKO-AM, IB Docket No. 95-91 (Dec. 14, 2001); Comments of KJNP, IB Docket No. 95-91 (Dec. 14, 2001).

broadcast auxiliary service (BAS) receivers which operate in the 1990-2110 MHz band and 2450-2500 MHz band. NAB at 7-9.

Discussion

I. XM RADIO AND SIRIUS AGREE ON A NUMBER OF KEY POINTS

A. Power Should Be Calculated by Averaging Over 360 Degrees

XM Radio and Sirius agree that the Commission should calculate the power of the repeater or repeaters at a given site by averaging the cumulative power over 360 degrees. XM Radio at 9-12; Sirius at 6-8. The Commission has adopted this measurement technique for MDS and ITFS licensees.⁸ Both XM Radio and Sirius demonstrated that, for a given WCS receiver blanketing interference threshold, the same amount of conducted power applied to a sectorized antenna will result in a smaller exclusion zone when compared to an omnidirectional antenna. XM Radio at 11; Sirius at 7. Thus, a measurement technique that averages power over 360 degrees more accurately describes the interference environment created by the operation of the typical sectorized DARS repeater.

The WCS Coalition cites Section 73.318 of the FCC's rules (dealing with blanketing interference caused by FM stations) as support for classifying repeaters based on their power in any direction rather than their average power over 360 degrees. WCS Coalition 8 n.17. This takes the FM blanketing rule out of context. XM Radio supports the FM rule's use of a transmitter's directionality to define the outer edge of the broadcaster's liability zone; this is completely consistent with what the Commission proposes for DARS repeaters. The FM rule, however, does not purport to create two classes of FM transmitters based on their directional power—which is the principle for which it is cited by the WCS Coalition. The only rational

⁸ 47 C.F.R. §§ 21.904(a), 74.935(a).

approach to creating two classes of repeaters is to consider the overall size of the potential exclusion zone that each repeater creates, which requires the power to be averaged over 360 degrees. In that regard, the repeater's use of a directional antenna is irrelevant, as is Section 73.318. (It also bears noting that Section 73.318 precludes claims of protection from a complainant that uses either a high-gain antenna or an antenna booster amplifier, both of which the WCS licensees have indicated they intend to use.)

B. The Commission Should Not Impose a Freeze on Deployment of Higher Power Repeaters

XM Radio and Sirius agree that a freeze on the operation of higher power repeaters will have a devastating impact on the DARS industry. XM Radio at 16-18; Sirius at 8-11. The STA requests were preliminary in nature, representing the DARS licensees' best guess at that time for the repeater deployment needed to initiate service in about sixty markets. A freeze would eliminate the DARS licensees' ability to improve service in those markets by precluding not only the deployment of new repeaters, but also the ability to move a repeater or change the antenna orientation. XM Radio at 16-18; Sirius at 9-10. In addition, as XM Radio explained in its Comments, it needs the ability to deploy a limited number of higher power amplifiers it currently has in inventory in new, smaller markets such as Tallahassee, Florida and Des Moines, Iowa, which were not covered in its STA request. XM Radio at 17-18. Having to rely on lower power repeaters in these markets would not only create more of an interference problem, it would also preclude XM Radio from using its limited inventory of higher power repeater amplifiers it reasonably purchased in 1997, based on the lack of opposition on the record to DARS repeaters, in order to have a repeater network in place by the time it launched its satellites.⁹

⁹ The WCS Coalition cites a trade press article in which XM Radio's CEO was quoted as stating that XM Radio had reduced the number of repeaters in operation to 800-850.

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The most egregious result of the freeze is that it will benefit no one while at the same time harming the public by depriving them of the highest quality digital radio possible. The WCS licensees plainly state that they “are still in the design phase of their networks and are not likely to have significant deployment within the 18-month compensation period.” WCS Coalition at 14. They even refer to the fact that they do not have to meet their “substantial service” milestone until August 2007. *Id.* The WCS licensees are simply not using their spectrum and have stated on the record that they have no immediate plans to do so; thus, a freeze on higher power repeaters will not avoid any interference and will at the same time irreparably harm the DARS industry.

In contrast to the WCS licensees, XM Radio in its first three months of service has proven to be a great success. One need only look at the numerous awards XM Radio has already won – including Fortune Magazine’s Product of the Year¹⁰ – to realize that DARS is bringing about the consumer benefits the Commission hoped it would be when its issued licenses in

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WCS Coalition at 17 (citing *Communications Daily*, Nov. 15, 2001, page 7). As XM Radio explained in its Comments, during the first two months of providing commercial service, it has identified as unnecessary certain of the repeaters in some of the initial sixty markets listed in its STA request. XM Radio at 17. Rather than limiting the STA to the repeaters XM Radio is currently operating, as the WCS Coalition suggests, the Commission should afford XM Radio the flexibility to relocate these repeaters to new sites and new cities so that more people can enjoy the benefits of DARS.

¹⁰ Peter Lewis, *My Favorite Things*, Fortune Magazine, Dec. 24 2001, at 169 (naming XM Satellite Radio “Product of the Year” and stating “[o]f all the new technologies of 2001, XM Satellite Radio is way, way, way above the rest. It’s the first major advance in radio since FM emerged in the 1960s, and the best thing to happen to mobile music since the dashboard CD player.”)

1997.¹¹ A freeze on higher power repeater deployment now to appease a WCS industry that is warehousing its spectrum would be a serious blow to one of the few bright lights in an otherwise struggling telecommunications industry.

C. Sirius's Proposed Power Cap and Number Cap Proposals Are Reasonable

XM Radio supports Sirius' proposal that the Commission adopt either (i) a power cap of 18 kW EIRP (averaged over 360 degrees)¹² or (ii) a cap of 155 repeaters that each DARS licensee can operate with an EIRP greater than 2 kW EIRP (averaged over 360 degrees), rather than the proposed safe harbor/liability zone approach. Sirius at 11-14. Both the power cap and number cap proposals are administratively simpler than the safe harbor/liability zone approach. In addition, both proposals provide WCS licensees with certainty as to DARS repeater deployment. The WCS Coalition states that WCS licensees are still in the development stages and have until August 2007 to meet their milestone requirement. WCS Coalition at ii, 14. With either a power cap or a number cap, any interference problems presented by DARS repeaters would be bounded and WCS licensees would be able to design equipment and develop business plans accordingly.

D. XM and Sirius Agree on Most But Not All Aspects of a Proposal for Using Safe Harbor and Liability Zones

XM Radio and Sirius agree on many modifications to the safe harbor/liability zone proposal, such as (i) limiting DARS licensees to compensate WCS licensees only for filters for remedying interference to WCS base stations and not requiring compensation for labor costs or

¹¹ See American Mobile Radio Corporation, *Order and Authorization*, 13 FCC Rcd 8829 (Oct. 16, 1997); Satellite CD Radio Inc., *Order and Authorization*, 13 FCC Rcd 7971 (1997).

remedying interference to CPE (XM Radio at 21, 23; Sirius at 21-22); (ii) limiting the compensation period to one year from the grant of the DARS STAs (*i.e.*, until September 17, 2002) (XM Radio at 22; Sirius at 19); (iii) sharing financial liability for filters with WCS licensees after January 1, 2002 (XM Radio at 22; Sirius at 18-19); (iv) limiting the total liability of each DARS licensee for filters at no more than \$10,000 per WCS base station site and \$1 million total (XM Radio at 22-23; Sirius at 19-20); and (v) placing the burden on WCS licensees to demonstrate that blanketing interference from a DARS repeater prevents the provision of commercial service (XM Radio at 21-22; Sirius at 18).

XM Radio and Sirius differ, however, on their proposals for calculation of the safe harbor and liability zones. XM Radio at 21; Sirius at 14-17. Under the Sirius approach, the safe harbor and liability zone would be calculated using a constant WCS receiver overload sensitivity threshold of -35 dBm. Sirius at 16. With this threshold, the liability zone would be an area within a 2.2 mile radius from any repeater with an EIRP above 2 kW (averaged over 360 degrees) and the safe harbor would be an area within a .5 mile radius from a repeater. Sirius at 17. XM Radio urged the Commission to limit the overload threshold WCS licensees can claim in calculating the safe harbor and liability zone to those receiver sensitivity thresholds for base stations they have previously claimed to be applicable to their development efforts. XM Radio at 21.

The WCS Coalition argues that the proposal to not afford WCS licensees protection within the area in which they would suffer interference from a 2 kW repeater is fundamentally flawed. WCS Coalition at 13. The WCS Coalition argues that there is a “tremendous qualitative

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¹² If the Commission does not adopt averaging of power over 360 degrees, then XM Radio
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difference” between operating near a 2 kW repeater versus a 40 kW repeater, and that the safe harbor would be a “dead zone” if a 40 kW repeater is at its heart. *Id.* Although it is true that the power flux density at a point within the safe harbor could be higher for the 40 kW EIRP repeater compared to a 2 kW EIRP repeater (dependent upon physical topography of terrain between a DARS repeater and WCS base station), a filter solution for alleviating interference from the 2 kW repeater would normally be designed with adequate margin to handle the 13 dB stronger signal from the 40 kW unit. XM Radio has provided data in its White Papers that demonstrate that filters are available which provide up to 35 dB rejection of DARS repeater power while introducing less than 1 dB of insertion loss to the WCS receiver.¹³ These filters are as appropriate for the resolution of interference from DARS repeaters operating at 40 kW as they are for repeaters operating at 2 kW.

XM Radio agrees that Sirius’s safe harbor/liability zone approach is administratively simpler than XM Radio’s proposal, but XM Radio’s approach would hold the WCS licensees accountable for the claims they have been making to the Commission in this proceeding.¹⁴ That

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urges the Commission set a power cap at 40 kW EIRP.

¹³ See Letter from Bruce D. Jacobs, Counsel for XM Radio Inc., to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (August 29, 2001) (“*XM White Paper*”); Letter from Lon C. Levin, XM Radio Inc., to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (September 14, 2001) (“*XM White Paper Supplement*”).

¹⁴ AT&T Wireless Services Inc. (“AWS”) has stated that the sensitivity threshold for its WCS base stations is -45 dBm and for its customer premises equipment is -58.6 dBm. See Comments of AT&T Wireless Services Inc., File No. SAT-STA-20010712-00063, at 8 (August 21, 2001); Letter from William M. Wiltshire, Counsel for AT&T Wireless, to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (April 30, 2001), at 5. BellSouth Corporation (“BellSouth”) has assumed that the sensitivity threshold for its WCS receiver will be -35 dBm (which is actually -58 dBm when the antenna gain is added). Comments of BellSouth, File No. SAT-STA-20010712-00063, at Attachment A (August 21, 2001). WorldCom Inc. (“WorldCom”) has stated that the sensitivity threshold for both its WCS

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is, in calculating the safe harbor zone, WCS licensees should not be able to specify a receiver overload sensitivity threshold that demonstrates less susceptibility to interference from repeaters than they have previously stated on the record. In calculating the liability zone, however, WCS licensees should not be permitted to specify an overload sensitivity threshold that demonstrates more susceptibility to interference than -58 dBm, which is the most sensitive figure they have provided to date. However, if a WCS licensee improves its equipment design, it should be required to calculate the liability zone (but not the safe harbor) using the sensitivity threshold that demonstrates less susceptibility to interference. For WCS licensees that have not participated in the DARS repeater rulemaking, XM Radio agrees with Sirius that the Commission should use a receiver sensitivity threshold of -35 dBm in calculating the safe harbor and liability zone.

Both XM Radio and Sirius agree that the Commission should not allow the WCS licensees to game the compensation scheme by allowing WCS licensees to alter their receiver sensitivity numbers in order to minimize the safe harbor in some cases or to maximize the liability zone in other cases. XM Radio at 21; Sirius at n.38. In addition, XM Radio continues to urge the Commission to require WCS licensees to submit their base station receivers to independent third party testing to verify that their receiver sensitivity figures are accurate.

The WCS Coalition takes issue with the Public Notice because the term “overload” is not defined. WCS Coalition at 9 n.18. It notes that overload could mean the point at which the

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hub receivers and customer premises equipment is -51 dBmW. Comments of WorldCom Inc., File No. SAT-STA-20010712-00063, at Exhibit 1 (August 21, 2001). Metricom Inc. (“Metricom”) has stated that the sensitivity threshold for its WCS receiver is -32 dBm at the antenna. Comments of Metricom Inc., Debtor-In-Possession, File No. SAT-STA-20010712-00063, at Exhibit A (August 21, 2001).

receiver goes into compression or the point at which it experiences a 1 dB rise in the noise floor.

Id. WCS licensees in the past have used 10 dB below the 1 dB compression point as the definition of overload, so XM Radio has based its comments on that definition.¹⁵

E. Internet Posting of DARS Repeater Locations and Technical Parameters Should be an Option But Not a Requirement

XM Radio and Sirius differ on their approaches to providing other licensees with notice prior to commencing operation of a DARS repeaters. Both DARS licensees agree that they should provide WCS licensees with 30-days notice prior to operating a repeater. XM Radio at 24, 26-27; Sirius at 22-23. Sirius proposes that DARS licensees post their repeater locations and technical parameters on the Internet. Sirius at 22-23. XM Radio proposes that before commencing operation of a repeater in the licensed service area of a WCS, MDS, or ITFS licensee, DARS licensee should be required to give notice only to those WCS, MDS, and ITFS licensees that are actually operating facilities for commercial service. XM Radio at 15-16, 24, 27. In addition, XM Radio proposes that the Commission require WCS, MDS, and ITFS licensees to provide notice to DARS licensees prior to operating a facility. XM Radio at 15-16, 24, 27.

XM Radio does not disagree with Sirius that posting information regarding repeaters on the Internet should be an option for DARS licensees. As Sirius explains, contacting each WCS licensee may be burdensome for a DARS licensee when posting this information on the Internet would serve the same purpose. Sirius at 23. XM Radio, however, does not believe that DARS licensees should be required to post this information on the Internet. There is no reason to share

¹⁵ See Letter from Karen Possner, BellSouth Corporation, to Ms. Magalie Roman Salas, IB Docket 95-91 (March 8, 2001) (attaching letter from John Tehan, at 2); *see also* Letter from William Wiltshire, Counsel for AT&T Wireless, to Ronald Repasi, FCC, IB Docket 95-91 (establishing 1 db compression point as a metric for evaluating front end overload).

information regarding repeater locations and technical parameters with parties that would not have an interference concern. Rather, as XM Radio proposed, the Commission should afford DARS licensees the option to provide notice to only those WCS, MDS, and ITFS licenses that are actually providing service in the vicinity of a repeater.

XM Radio also continues to urge the Commission to require reciprocal information sharing from WCS, MDS, and ITFS licensees. XM Radio at 15-16, 24, 27. If XM Radio has knowledge of where WCS, MDS, and ITFS facilities are located, it may be able to place repeaters in areas where they will not present an interference concern. Thus, if the Commission adopts the Sirius proposal and requires DARS licensees to post their repeater locations and technical parameters on the Internet, the Commission also should impose a reciprocal obligation on WCS, MDS, and ITFS licensees.

II. THE SAFE HARBOR/LIABILITY ZONE PROPOSAL AS MODIFIED AS SUGGESTED BY XM RADIO IS A REASONABLE AND EQUITABLE SOLUTION TO WCS LICENSEES' INTERFERENCE CLAIMS

A. The WCS Coalition's "Sunset" Proposal Would Impose Enormous and Needless Costs on DARS Licensees

The WCS Coalition's "sunset" proposal would impose enormous costs on DARS licensees and impair service to the public. First, WCS can operate successfully without significant additional cost by using appropriate filters and RF AGC—as XM Radio and Sirius have done and as is standard practice in most wireless industries. Second, requiring DARS licensees to power down to 2 kW would require them to completely redesign their existing networks, impose an unnecessary cost of hundreds of millions of dollars, and take several years to implement. Third, the "sunset" proposal would leave the DARS licensees with a warehouse of useless higher power amplifiers procured in good faith based on the lack of record opposition to higher power repeaters, in an effort to ensure that a repeater network would be in place upon

launch of their satellites. Fourth, powering down and redeploying networks will disrupt service to existing customers during the transition to the new networks. Fifth, powering down to 2 kW would adversely affect XM Radio's ability to cover urban areas without causing self-interference. XM Radio has determined that a single frequency broadcast network ("SFN") is the most efficient and effective design for its repeater network. In an SFN, all repeaters in a given area must be precisely timed and coordinated with one another in order to provide reliable, high-quality service. A higher power repeater effectively serves as a keystone for managing the synchronization of the overall repeater network in a city. With a power cap of 2 kW, the ability to deploy this type of network would be limited. Finally, XM Radio has presented evidence that demonstrates that potential for interference to WCS receivers is reduced by a repeater network design that emphasizes fewer higher power repeaters instead of more lower power repeaters.¹⁶

The WCS Coalition argues that the "sunset" proposal will lead to "market based" solutions whereby WCS and DARS licensees can negotiate to allow for the operation of a higher power repeater. WCS Coalition at 20-21. Yet, these are the same WCS licensees who have insisted throughout the rulemaking, despite overwhelming evidence to the contrary, that more lower power repeaters are better than fewer higher power repeaters.¹⁷ There can be no "market-based solution" when one side has absolutely no desire to negotiate.

¹⁶ See Letter from Bruce D. Jacobs, Counsel for XM Radio Inc., to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (August 29, 2001) ("*XM White Paper*"), at 15-20; Letter from Lon C. Levin, XM Radio Inc., to Ms. Magalie Roman Salas, FCC, IB Docket No. 95-91 (September 14, 2001) ("*XM White Paper Supplement*"), at 17-18.

¹⁷ See, e.g., Letter from WCS Licensees to Ms. Magalie Roman Salas, IB Docket 95-91 (Sept. 7, 2001), at 3 (stating that "[t]he WCS Parties were unanimous in their opposition to allowing the operation of any DARS terrestrial repeaters operating at power levels in excess of 2 kW"); Letter from Karen Possner, BellSouth Corporation, to Ms. Magalie Roman Salas, IB Docket 95-91, at 5-6 (May 18, 2001).

B. The Safe Harbor/Liability Zone Concept Is a Reasonable Solution to the Interference Concerns of WCS Licensees

The WCS Coalition argues that the safe harbor/liability zone proposal is arbitrary and capricious because it does not adequately compensate WCS licensees for interference from DARS repeaters. The WCS Coalition also argues that this proposal is inconsistent with Commission policy and precedent because (i) it does not establish the 2 kW power cap that the Commission imposed on WCS licensees to protect MDS/ITFS facilities; (ii) it will deter participation in future auctions; and (iii) will reward DARS licensees for deploying repeater networks without prior Commission approval.

The only thing arbitrary and capricious about the Commission's proposal is that it makes any concessions to WCS licensees that slept on their rights to participate and when they finally woke up have demonstrated no actual harm, but only speculative and unreasonable concerns about worst case situations against which they can easily protect themselves. In many months of tests and operations of hundreds of repeaters, WCS licensees have yet to have a single complaint. When testing was done of actual WCS equipment in Houston, it demonstrated that the worst-case fears of WCS licensees are wildly exaggerated. XM Radio at 5, Exhibit A. The record evidence in this proceeding conclusively establishes that susceptibility of the WCS receiver to blanketing or intermodulation interference can be improved substantially, without adding significant cost and without detracting from quality of service, through basic receiver design or through the use of in-line filters for WCS base stations and RF AGC for CPE.¹⁸ In addition, XM Radio has shown that WCS licensees can substantially reduce their susceptibility to interference

¹⁸ *XM White Paper* at 1-7; *XM White Paper Supplement* at 2-13.

by designing their networks with DARS higher-power repeater sites in mind.¹⁹ Nonetheless, in the interest of compromise, XM Radio and Sirius have agreed with an approach that provides limited compensation to WCS licensees that can show actual harm.

The safe harbor/liability zone proposal will not violate Commission precedent or policy. The concept is not inconsistent with the Commission's 1997 decision to impose a 2 kW power limit on WCS licensees to protect MDS/ITFS licensees.²⁰ In that proceeding, the Commission found that a 2 kW power limit would not limit WCS licensees' operational flexibility nor impose significant costs because it was unlikely that a WCS licensee would even consider operating at greater than 2 kW given the prohibitive cost of manufacturing a transmitter with that power that could meet the stringent out-of-band emission limits for the WCS service.²¹ Not one WCS licensee even proposed to operate at a power level above 2 kW. In contrast, the DARS licensees have been proposing to operate high power repeaters since 1990.²² Unlike the 2 kW limit imposed on WCS licensee, a 2 kW limit would result in substantial costs for DARS licensees.

In addition, in establishing the 2 kW power limit for WCS licensees, the Commission was concerned less with a specific power limit than with establishing *some* power limit for WCS so that wireless cable equipment manufacturers would have certainty as to WCS power levels. The

¹⁹ *XM White Paper* at 7-10.

²⁰ Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, *Memorandum Opinion and Order*, 12 FCC Rcd 3977 (April 2, 1997) ("*WCS Reconsideration Order*").

²¹ The Commission stated, "With respect to the power limits we are setting, we believe it is unlikely that, in the foreseeable future, any potential WCS operator would consider employing power levels greater than these limits given the considerable economic cost of developing high power transmitters that would comply with the stringent out-of-band emission limits adopted in this proceeding." *Id.* ¶ 13.

²² Application of Satellite CD Radio, Inc., File No. SAT-LOA-19900518-00037 (May 18, 1990).

Commission had initially adopted rules for WCS licensees that contained no power limit at all.²³ It was only after MDS/ITFS licensees filed an emergency reconsideration petition that the Commission adopted the 2 kW limit in order to provide certainty to MDS/ITFS licensees. Similarly, XM Radio and Sirius have agreed to a power limit of 18 kW EIRP (averaged over 360 degrees).

Finally, in the WCS proceeding, the Commission observed that the maximum power level for MDS/ITFS licensees was 2 kW EIRP, that WCS and MDS/ITFS licensees were both potential providers of wireless cable service, and thus a 2 kW power limit would ensure competitive parity. *WCS Reconsideration Order* at ¶ 13. There should be no concern for competitive parity between DARS and WCS licensees, as DARS licensees are not planning to offer wireless cable, voice, or the other services WCS licensees have stated they might provide with their spectrum. And WCS licensees are not planning to offer satellite digital radio service in competition with the DARS licensees. To the extent that a sufficient number of WCS licenses can be aggregated to form a satellite DARS provider (an effort which has failed in the past²⁴), then at that time the Commission can consider whether a 2 kW power limit is still appropriate for the WCS bands for purposes of competitive parity.

If the Commission adopts the safe harbor/liability zone concept as modified by XM Radio, it will not deter participation in future auctions as the WCS Coalition suggests. WCS Coalition at 5-6. Far from constraining use of WCS spectrum, the safe harbor/liability zone

²³ Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, *Report and Order*, 12 FCC Rcd 10785 (February 19, 1997).

²⁴ See Application of WCS Radio Inc. for Authorization to Construct, Launch, and Operate Two Communications Satellites in the Digital Audio Radio Service, File No. SAT-LOA-19981113-00085/86 (Nov. 13, 1998).

concept is a windfall for WCS licensees considering they have had notice since 1990 of DARS licensees' plans for even higher power repeaters and that they can easily resolve any alleged interference problems themselves.

The DARS licensees have not forced the Commission into considering higher power repeaters as a result of deploying repeater networks pursuant to an experimental license. WCS Coalition at 9-10. XM Radio proceeded at its own risk in the construction of these facilities. That risk, however, was entirely reasonable given the lack of opposition on the record to higher power repeaters and the need to meet its milestones. The WCS licensees may be content to warehouse their spectrum, but the DARS licensees refusal to do so should not be held against them.

Finally, despite WCA's suggestion, the operation of higher power repeaters in the DARS band should have no impact on the pending Third Generation Wireless proceeding. WCA at 1 n.2. DARS repeater plans have been known since 1990 and any reallocation plans must take them into account. In addition, provided reasonable engineering techniques are employed, such as that suggested by XM Radio in this proceeding, operation in the 2385-2400 MHz band in proximity to a higher power DARS repeater should not present a problem.

III. THERE IS NO NEED FOR A RULE TO PROTECT MDS/ITFS RECEIVERS FROM DARS REPEATERS

Both XM Radio and Sirius demonstrated in their Comments that there is no reason for the Commission to extend to DARS licensee the WCS rule for protection of MDS/ITFS analog receivers. XM Radio at 25-27; Sirius at 24-25. Due to the advent of WCS and personal communications services ("PCS") systems operating in the 1930-1990 MHz band, MDS/ITFS licensees have been replacing legacy analog receivers with new digital receivers that are less susceptible to interference. XM Radio at 25-26; Sirius at 25. In addition, the rule for protecting

these legacy block downconverters sunsets on February 20, 2002, demonstrating the Commission's intent that MDS/ITFS licensees would have taken the necessary steps to replace these outdated receivers by the time repeater rules are effective. XM Radio at 26.

Neither WCA nor the National ITFS Association state how many analog MDS/ITFS receivers are still in operation that might require protection. Thus, with no evidence documenting the extent of the interference concern, the Commission is being asked to adopt a rule to remedy an interference problem that has not been shown to even exist. Tellingly, XM Radio has never received a complaint regarding interference to an analog MDS/ITFS receiver during its operations pursuant to an experimental license or its STA.

IV. BLANKETING INTERFERENCE TO BAS FACILITIES IS HIGHLY UNLIKELY AND WILL BE ADDRESSED WITHOUT REGULATION

For the first time in the seven-year history the DARS repeater rulemaking, the NAB raises concerns with blanketing interference to BAS facilities that operate in the 1990-2110 MHz and 2450-2500 MHz bands. NAB at 7-9. NAB's concern with interference to BAS facilities comes hopelessly late in the DARS rulemaking and should be dismissed outright. Interference from DARS repeaters to BAS facilities is extremely unlikely. Even assuming the worst-case overload figure of -20 dBm for a BAS receiver and assuming a 40 kW EIRP DARS repeater, the BAS receiver would have about 21 dB of margin if it is located just one meter away from the DARS repeater.²⁵ The only time a DARS repeater could possibly cause interference to a BAS

²⁵ NAB states that a signal level of between -10 and -20 dBm will overload the Low Noise Amplifier in a typical BAS receiver. NAB 9 n.18. NAB calculates that a 2 kW repeater in close proximity to a BAS receiver would produce a signal level of -14 dBm, thereby overloading the receiver. In 2.3 GHz band where XM Radio operates, there is 40 dB of attenuation by increasing the distance from the DARS transmitter from zero meter to one meter. Assuming a worst-case overload threshold of -20 dBm, if an XM signal at one meter is -54dBm (-14 dBm - 40 dB), then the BAS receiver will have 34dB of margin just one meter away from a 2 kW EIRP repeater. Even if the DARS repeater were

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receiver would be if the two facilities were literally right next to one another, a situation that could only exist if the DARS repeater and BAS receiver were collocated on a tower or rooftop. In such a case, the interference would be resolved privately, typically by the newcomer making adjustments to eliminate the interference. So far, in its installation of several hundred repeaters, XM Radio has encountered two such cases. In both, XM Radio easily resolved these problems after discussions with the BAS licensee by simply moving the antenna. Thus, given the untimely nature of the NAB's concerns, the infrequency with which interference to BAS facilities from DARS repeaters will occur, and the fact that these types of interference disputes are handled privately, there is no reason for the Commission to adopt rules concerning interference from DARS repeater to BAS facilities.

V. XM RADIO HAS NO INTENT TO ORIGINATE LOCAL PROGRAMMING OR TO STORE PROGRAMMING AT A REPEATER

The NAB objects to language in the Public Notice that would require DARS repeaters “to transmit the complete programming, and only that programming that is also transmitted by an authorized DARS satellite and in such a way that the satellite signal and the terrestrial repeater signal are received *nearly simultaneously* by SDARS subscriber receivers.” Public Notice at 3 (§ I.B) (emphasis added). NAB objects to the term “nearly simultaneously” because it could be construed to allow a DARS licensee to store programming at a repeater for later local origination from that repeater. NAB at 5. As an alternative to the language proposed in the Public Notice, the NAB urges the Commission to adopt the same language regarding local programming used in the Orders granting the DARS licensees their STAs: “SDARS repeaters are restricted to the

Footnote continued from previous page

operating at 40 kW EIRP, the BAS receiver would still enjoy 21 dB of margin at one meter.

simultaneous retransmission of the complete programming, and only that programming, transmitted by the satellite directly to the SDARS subscriber's receivers."²⁶

XM Radio has no intent to originate local programming from its repeaters. XM Radio believes that both the language suggested in the Public Notice and the language used in the STA Orders that the NAB prefers adequately convey that DARS repeaters cannot be used to originate local programming. Thus, XM Radio would not object if either of the proposed terms were adopted in the final rules. Regardless of which of two options are used for final rules, the Commission should recognize, as the NAB does, that it is impossible for XM Radio's satellite signal and XM Radio's terrestrial repeater signal to be received simultaneously by its subscribers' receivers. *See* NAB at 5. XM Radio's repeaters receive the satellite signal at the same time a DARS subscriber receives the satellite signal. But, XM Radio's repeater must then retransmit the satellite signal, thereby creating a slight delay in reception of the two signals at a subscriber receiver. The Commission should affirm that this arrangement does not violate the Commission's final rule.

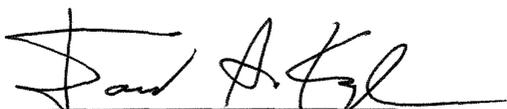
²⁶ *XM STA Order* at ¶ 18; *Sirius STA Order* at ¶ 18.

Conclusion

For the aforementioned reasons, XM Radio urges the Commission to act consistently with the views expressed herein.

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December 21, 2001

Technical Certification

I, Phillip Barsky, Spectrum Management/Regulatory System Engineer for XM Radio Inc., certify under penalty of perjury that:

I am the technically qualified person responsible for the preparation of the technical information contained in the above "Reply Comments." The information contained in this document is true and correct to the best of my belief.


Phillip Barsky

Dated: December 21, 2001

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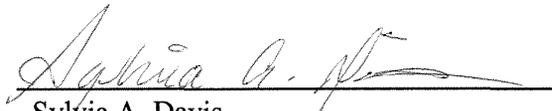
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