WILKINSON BARKER KNAUER LLP

2300 N STREET, NW
SUITE 700
WASHINGTON, DC 20037
TEL 202.783.4141
FAX 202.783.5851
www.wbklaw.com
PAUL J. SINDERBRAND
psinderbrand@wbklaw.com

May 19, 2008

Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band* (WT Docket No. 07-293) and *Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band* (IB Docket No. 95-91)

WRITTEN EX PARTE PRESENTATION

Dear Ms. Dortch:

Recently, XM Radio Inc. ("XM") and Sirius Satellite Radio Inc. ("Sirius") have taken to circulating among Commission staff a listing that purports to be the "top 10 things WCS got wrong" in this proceeding.[1] As has become their *modus operandi*, XM and Sirius once again mischaracterize the positions being espoused by the WCS Coalition, advance technical positions derived from unrealistic worst case assumptions, ignore the realities of real world operations that will mitigate potential interference, put forth questionable science, and rely on obfuscation and misdirection to distract the Commission from a record that supports adoption of the WCS Coalition's recommendations. The WCS Coalition has been sorely tempted to ignore this simplistic list, as there is nothing in it that the WCS Coalition has not previously refuted. However, in the interest of assuring a complete record, I am writing on behalf of the WCS Coalition to remind the Commission that it is XM and Sirius that have it wrong. While it is not the WCS Coalition's intent to burden the Commission with a detailed response to every claim advanced by XM and Sirius, their continued posturing compels the WCS Coalition to address the major issues below.

1. SDARS claims WCS "Completely Ignored Critical Impact of Signal Overload." WRONG!

Contrary to the claim by XM and Sirius, the WCS Coalition has hardly ignored the potential vulnerability of SDARS (or, for that matter, WCS) receivers to overload interference.

[1] *See, e.g.*, Letter from Patrick L. Donnelly and James S. Blitz, IB Docket No. 95-91, *et al*, Attachment at 10 (filed May 14, 2008)["XM/Sirius *Ex Parte*"].

Indeed, the WCS Coalition's own proposal for rules to govern co-existence among the Wireless Communications Service ("WCS") and the satellite Digital Audio Radio Service ("SDARS"), as well as its Comments and Reply Comments in response to the recent *Notice of Proposed Rulemaking* in these proceedings, addressed the potential for interference due to overload in detail.[2] Overload of WCS base stations and user devices is certainly possible under the special temporary authorizations granted for SDARS terrestrial repeaters. And, overload of SDARS receivers is possible under the rules that today allow WCS mobile stations to transmit with a maximum equivalent isotropically radiated power ("EIRP") of 20 watts and allow WCS fixed stations to transmit at 2000 watts peak EIRP. The WCS Coalition has candidly conceded throughout this proceeding that even under its proposed rules, WCS and SDARS facilities will be subject to some interference under worst circumstances. However, the WCS Coalition has also demonstrated that the risk of harmful interference due to overload is probabilistic, and that Part 25 and Part 27 rules can be crafted that limit power in a manner that minimizes overload under real world operating conditions without imposing material harm on WCS or SDARS.

Indeed, this latter point was demonstrated when the WCS Coalition recently submitted to the Commission a report from ATECS LLC ("ATECS") on field testing conducted to determine the susceptibility of a variety of commercially-available XM and Sirius receivers to overload interference.[3] As the WCS Coalition has previously reported, the test results establish that WCS handheld devices operating pursuant to the rules proposed by the WCS Coalition will not pose a material threat of overload at separation distances in excess of three meters (which both sides agree is the appropriate separation distance for analysis given how unlikely it is that a WCS transmitter will be closer to a SDARS receiver). These results are particularly noteworthy because ATECS conducted this testing without the benefit of transmit power control, without a realistic mobile duty cycle, and without the sorts of obstructions between the WCS device and the SDARS reception antenna that would be expected under "real world" conditions (*e.g.* other pedestrians or automobiles). It is astonishing that XM and Sirius continue their rhetoric that the WCS Coalition "completely ignored" overload when the WCS Coalition has proven that overload from mobiles does not pose a realistic threat. Apparently, just as the SDARS licensees have a track record of ignoring the Commission rules they do not like, in this proceeding they are just going to ignore the facts that they find inconvenient.

---

[2] *See* Letter from Paul J. Sinderbrand, Counsel to WCS Coalition, to Marlene H. Dortch, FCC Secretary, IB Docket No. 95-91, at 5-8 (filed July 9, 2007); Comments of WCS Coalition, WT Docket No. 07-293 *et al*, at 12-14 (filed Feb. 14, 2008)("[The] susceptibility of SDARS receivers to overload interference is critical, for it makes no sense for the Commission to impose unduly restrictive OOBE attenuation requirements on WCS to address scenarios where SDARS receivers mute anyway due to overload (even in the presence of WCS power levels permissible under the Commission's long-standing Part 27 rules).")["WCS Comments"]; Reply Comments of WCS Coalition, WT Docket No. 07-293 *et al*, Attach. A at 1-3 (filed Mar. 17, 2008)["WCS Reply Comments"].

[3] *See* Letter from Paul J. Sinderbrand, Counsel to WCS Coalition, to Marlene H. Dortch, FCC Secretary, WT Docket No. 07-293 *et al* (filed May 9, 2008).

In contrast, XM and Sirius have made no effort to meet their burden of demonstrating that the currently-permitted WCS mobile power levels (effectively the 250 milliwatt limit imposed by the Commission's RF exposure protection rules) can be slashed to the levels they propose without material adverse impact on planned WCS networks.[4] This failure illustrates their hypocrisy. They claim (and the WCS Coalition agrees) that the WCS Coalition should not be entitled to the OOBE relief it seeks if the proposed rule change would impose unreasonable burdens on SDARS. However, XM and Sirius make no effort to establish that reducing the permitted power levels for WCS mobiles to 10 milliwatts for the A and B Blocks and to 1 milliwatt for the C and D Blocks as they propose would be benign. Of course, that is hardly surprising, as the record shows that at such low power levels WCS licensees could not operate a viable mobile service.[5] As such, one is hard pressed to identify a policy justification for reducing the permissible WCS mobile power levels that have been in place for more than a decade.

2. SDARS claims that "OOBE Testing Methodology Overly Narrow and Fundamentally Flawed." WRONG!

The ATECS test report annexed as Attachment B to the WCS Coalition's Reply Comments is self explanatory as to the methodology employed in the conduct of WCS Coalition OOBE testing. Strangely, it appears that XM and Sirius are objecting to the fact that ATECS employed the same stepped OOBE mask in its testing that the WCS Coalition has proposed be incorporated in the rules.[6] This stepped mask *reduces* interference into the SDARS band as compared to a straight 55+10log(p) mask, and the evidence before the Commission establishes that it will allow viable mobile operations in the WCS band without causing unreasonable interference to SDARS subscribers.

The assertion by XM and Sirius that the stepped mask "sanctions added interference" is nonsense – so long as a SDARS subscriber receives one of the three available data streams without interference that causes muting, a rise in the noise level or an increase in the bit error rate associated with the other streams is of no moment. No SDARS subscriber is going to cancel service because the noise floor rises or the bit error rate increases; only muting that makes the SDARS subscriber incapable of listening to Howard Stern, Opie & Anthony, etc. will prove objectionable. For XM and Sirius to argue otherwise simply illustrates the propensity of the SDARS licensees to rely on unrealistic "worst case" scenarios to support restrictions on WCS that go far beyond what is reasonable.

---

[4] Moreover the overload testing conducted by XM and Sirius appears to have been fundamentally flawed (although they have withheld information necessary for the WCS Coalition, and the Commission, to be entirely certain of how those tests were conducted). Perhaps most significantly, it is unclear whether the interference identified in those tests arose due to overload or due to out-of-band emissions ("OOBE") because XM and Sirius have failed to disclose whether they utilized adequate filtering to eliminate OOBE as a source of interference. In any case,

[5] *See* WCS Reply Comments at 37-40.

[6] *See* XM/Sirius *Ex Parte* at 12 ("Stepped OOBE mask inappropriate, because it sanctions added interference to half of downlink channels.").

The ATECS test report establishes that the Commission can adopt the WCS Coalition's stepped mask without risk of unreasonable interference. The ATECS testing was conducted under conditions highly unfavorable to WCS – transmit power control was not used, there were no obstructions between the WCS transmitter and the SDARS receiver, the WCS antenna was aimed directly at the SDARS antenna; neither device was in motion, and both devices were always in operation. When those test results are augmented to reflect the impact of transmit power control (which the WCS Coalition has proposed be made mandatory for any device enjoying the benefit of the stepped OOBE mask), the ATECS report showed full protection of Sirius. While XM has chosen to channelize its spectrum in a different manner that makes half its channels more vulnerable to interference than Sirius', the record shows that interference to XM is highly probabilistic, and that the stars, the sun and the moon will rarely align in such a way that even an XM subscriber will suffer a service disruption due to WCS interference.[7]

XM and Sirius take issue with the WCS testing methodology because the testing was conducted with a stationary SDARS receiver and purportedly with clear line-of-sight to the SDARS satellites. As to this latter assertion, XM and Sirius are wrong, and they know it – the WCS Coalition noted during a joint meeting with SDARS and Commission staff last week, the XM satellite-only testing was conducted with a signal-to-noise ratio of approximately 9 dB, as opposed to the maximum observed signal-to-noise ratio of 14 dB. More importantly, XM and Sirius also conveniently ignore (a) that they conducted their tests in essentially the same manner; and (b) that the tests by both sides also assumed a stationary WCS transmitter (with no link margin sacrificed for fading) and with no obstructions between the WCS transmitter and the SDARS receiver (which will occur in the real world and provide additional attenuation). XM and Sirius are simply wrong to suggest that "real-world conditions with reduced link budget due to foliage, mobility, location, etc., will expand the WCS-generated muting zones."[8] To the contrary, when all of the characteristics of the real world are included in any analysis, it is evident that potentially interfering WCS signals will be substantially attenuated and that muting is unlikely to occur. It is for this reason that the WCS Coalition has suggested that, if the Commission desires the parties to conduct joint testing, it require that joint testing to be conducted under real world conditions.[9]

3. SDARS claims that WCS "Incorrectly Analyzed SDARS Receiver Noise Floor." WRONG!

The continued harping by XM and Sirius on whether they have correctly measured the noise floor is typical of their efforts to misdirect the Commission's attention from the important issue there -- whether, under real world operating conditions, SDARS subscribers are likely to

[7] *See* Letter from Paul J. Sinderbrand, Counsel to WCS Coalition, to Marlene H. Dortch, FCC Secretary, WT Docket No. 07-293 *et al*, Attachment at 21 (filed May 5, 2008).

[8] XM/Sirius *Ex Parte* at 12.

[9] *See* Letter from Paul J. Sinderbrand, Counsel to WCS Coalition, to Marlene H. Dortch, FCC Secretary, WT Docket No. 07-293 *et al*, at 2 (filed May 13, 2008).

suffer muting.[10] Rather than test the vulnerability of their receivers to WCS interference, XM and Sirius have merely contended that WCS mobile devices must attenuated OOBE such that the SDARS receiver noise floor, which they purport to have measured as -113.25 dBm/4 MHz, does not rise by more than 1 dB. As discussed above, however, a rise in the noise floor is of no moment to a SDARS subscriber if it does not result in muting, and the record establishes that, under a probabilistic model, such muting will be rare.

That said, the WCS Coalition has previously provided the Commission with an explanation of why it believes that XM and Sirius have measured the noise floor improperly.[11] For example, it appears that the XM and Sirius measurements of noise floor are approximately 2 dB too low because neither included a value for bias tee insertion loss or jumper cable loss in the noise floor equation. Should the Commission request, the WCS Coalition is prepared to present the Commission with a more detailed analysis of the errors in the SDARS noise floor analysis. However, at this stage of the proceeding, such an exercise would appear to be pointless. The WCS Coalition has presented the Commission with the results of actual testing which demonstrate that muting is unlikely to arise under real world conditions when the proposed stepped mask is employed. XM and Sirius can argue about the quantification of the SDARS receiver noise floor, but whatever that noise floor is, it was present when the actual testing took place. To continue debating how one quantifies the SDARS receiver noise floor misses the larger point – whatever the noise floor, WCS mobiles are not likely to cause harmful interference when more than three meters from a SDARS receiver.

4. SDARS claims that WCS "Significantly Overstated Path Loss." WRONG!

The path loss tests conducted by ATECS and NextWave and previously presented to the Commission by the WCS Coalition demonstrate that the SDARS licensees are greatly exaggerating the potential for interference to their subscribers.[12] XM and Sirius have understated the path loss between a WCS mobile device and a SDARS receiver, and thus have claimed that SDARS receivers will be subject to stronger interfering signal levels than actually will be realized under real world operating conditions.

Ten days ago, to assist the Commission in resolving this fundamental issue, the WCS Coalition submitted a report prepared by ATECS, "Comparative Analysis of Log-Distance Path Loss Models in WCS/SDARS Band."[13] In that report, ATECS reviews the acceptable methodology for taking accurate path loss measurements, and concludes that the WCS testing was conducted appropriately, showing "excellent correlation and repeatability." In addition, the

[10] *See* WCS Reply Comments at 11 n.28.

[11] *See id.*, Attach. A at 4-5.

[12] *See id*, Attach. A at 1-3, Attach. C at 3.

[13] *See* Letter from Paul J. Sinderbrand, Counsel to WCS Coalition, to Marlene H. Dortch, FCC Secretary, WT Docket No. 07-293 *et al*. (filed May 9, 2008).

ATECS report cites additional technical papers that support the WCS conclusion that path loss at 3 meters will exceed free space path loss by at least 12 dB, including an NTIA report which shows that a roof-mounted antenna (such as employed by SDARS) has an additional 8 to 30 dB of path loss as compared to a free-standing antenna (a point completely missed in the SDARS analysis of path loss). In short, the ATECS analysis confirms that the path loss to be expected between a WCS mobile transmit antenna and a SDARS receive antenna is greater than the SDARS licensees suggest, and is responsible in large part for the differences in their assessments of the potential for WCS to mute a SDARS receiver.

5. SDARS claims that WCS "Flip-flopped to Reject 1 dB OOBE Interference Threshold." WRONG!

Despite the rhetoric from XM and Sirius, the WCS Coalition has been completely consistent throughout this proceeding in its evaluation of OOBE interference. What they apparently object to is that the WCS Coalition has looked to muting of a SDARS receiver as the measure of impairment, while considering a WCS base station impaired if the noise floor rises by 1 dB. The WCS Coalition has taken this approach for a simple reason – SDARS receivers and cellular network base stations are different animals, and any evaluation of their susceptibility to harmful interference must reflect those differences.

As noted above in the response to item # 2, harmful interference to a SDARS receiver does not occur unless and until the signal is muted. A 1 dB raise in the noise floor at the SDARS receiver is not relevant unless it prevents the SDARS subscriber from listening to his or her programming of choice. Or, put another way, there is no reason why WCS mobiles should be restricted based on a noise floor rise that has no practical impact on the SDARS subscriber. By contrast, interference to a base station (whether in a WCS network or any other cellular network) must be evaluated by a different metric because, as the noise floor increases, the service range and throughput of the base station is reduced. Thus, while a rise in the noise floor does not completely preclude a base station from operating, it leaves areas previously served by that base station without service. This is why, as XM and Sirius recognize, the Commission routinely protects base stations from interference by precluding more than a 1 dB increase in the noise floor.

Simply put, there is no inconsistency by the WCS Coalition here – in each case the WCS Coalition is simply applying a metric for measuring harmful interference that is appropriate to the facility being protected. By contrast, XM and Sirius would have the Commission afford SDARS receivers far more protection than required to assure a satisfactory subscriber experience.

6. SDARS claims that WCS "Erroneously Claimed SDARS Receivers are Overly Sensitive." WRONG!

While SDARS may wish it were otherwise, the facts regarding the large disparity among SDARS receivers in susceptibility to interference speak for themselves. Sirius has included filtering of WCS signals in some, but not all of its receivers, while XM appears to have omitted such filtering from all of its receivers. The result is that many SDARS receivers are more sensitive to potential interference than they need to be. As the WCS Coalition noted in its Comments in response to the *Notice of Proposed Rulemaking*:

> It is worth noting that while many XM and Sirius devices do not include any filtering of WCS transmissions, filters used in some of Sirius' receivers do substantially attenuate WCS signals. Sample XM and Sirius subscriber antennas have been tested by a WCS Coalition member in a screen room facility to measure the frequency response. The frequency response of one Sirius and one XM antenna is shown in Attachment A. The response of the Sirius antenna indicates the presence of a bandpass filter that significantly attenuates most WCS blocks. However, not all Sirius antenna models demonstrated effective attenuation of the WCS blocks. The XM antenna shows an essentially flat frequency response across the WCS band, and every XM antenna tested was substantially similar. The WCS Coalition is aware of no technical reason why Sirius could not achieve the same WCS attenuation in all its devices, or why XM could not utilize the same filter technology employed by Sirius to provide similar rejection of the WCS band.[14]

Significantly, for all of their rhetoric, XM and Sirius have yet to respond in any substantive manner to the WCS Coalition's disclosure. Perhaps that is because they recognize that, regardless of whether filtering has been included in particular SDARS reciever; those receivers will rarely suffer interference under real world conditions if separated from a WCS mobile by at least three meters. The WCS Coalition relegated this point in a footnote to its Comments for a reason – while XM and Sirius can and should be doing a much better job of filtering potential interference from WCS and other sources, under real world conditions even the SDARS devices with lower immunity to interference are unlikely to mute.

7. SDARS claims that WCS "Substantially Overestimated Potential Interference from SDARS Repeaters to WCS Base Stations." WRONG!

While XM and Sirius nit-pick the individual market studies that the WCS Coalition presented as examples to illustrate the impact of continued operation of the existing high-powered terrestrial repeaters, they have provided nothing to refute the WCS Coalition's

[14] WCS Comments at 11, n.24.

fundamental point that XM and Sirius have underestimated the potential for interference from high-powered SDARS terrestrial repeaters to WCS base stations.[15]

For example, XM and Sirius claim that the WCS Coalition's studies were flawed because they assumed OOBE attenuation by SDARS of only 75+10log(p).[16] XM and Sirius assert that they actually provide attenuation into the WCS band of 90+10log(p). Yet, the October 17, 2006 Sirius petition for rulemaking proposed that SDARS only be required to meet a 75+10log(p) OOBE requirement,[17] and XM and Sirius have yet to repudiate that proposal and suggest they be required to attenuate OOBE to 90+10log(p). They cannot have it both ways.

Moreover, XM and Sirius have made no effort to refute the WCS Coalition's showing that they have grossly inflated the number of repeaters that would be installed were the Commission to require them to operate at a maximum of 2000 watts average EIRP.[18] For example, while XM claims that it would use 39 repeaters to replace its single high-power repeater in Indianapolis, the WCS Coalition has noted that in Columbus, Ohio (where the population of the Metropolitan Statistical Area is greater than that of Indianapolis), XM only utilizes four repeaters, of which three are operating below 2000 watts and the fourth is only marginally above 2000 watts (2500 watts). In Memphis, a city with a slightly smaller population than Indianapolis, XM currently provides coverage utilizing just seven terrestrial repeaters, five of which operate below 2000 watts and only two of which operate at higher powers (2500 watts and 2900 watts). XM has refused to explain why so many more repeaters are required to serve Indianapolis than to serve other markets of similar size and topography, leaving one no choice but to assume that SDARS is exaggerating greatly the impact of a 2000 watt average EIRP terrestrial repeater limit.

8. SDARS claims that WCS "Ignored Inherent Guard Band Protection in SDARS-Proposed Street Level Field Strength Limits." WRONG!

XM and Sirius claim that the spectral separation between SDARS terrestrial repeaters and the WCS bands that serves as a "guard band" of sorts, WCS receivers will tolerate an overload

[15] *See* WCS Reply Comments at 45-47. Admittedly, the parameters the WCS Coalition used in studying sample markets may not have been entirely accurate – given the propensity of XM and Sirius to construct repeaters where they want, when they want, and with whatever technical parameters they want, and to then feed accurate information to the Commission in drips and drabs only as they see fit, minor errors are unavoidable. None, however, undercut the larger point made by the WCS Coalition – that interference from the existing high-powered repeaters will be problematic for WCS unless the Commission either requires a power reduction to a maximum of 2000 watts average EIRP or retains the current obligation that XM and Sirius cure any interference those repeaters cause.

[16] Reply Comments of Sirius Satellite Radio Inc., WT Docket 07-293 *et al*, Exhibit A at 14-15 (filed Mar.17, 2008); Reply Comments of XM Radio Inc., WT Docket 07-293 *et al*, Appendix B at 14-15 (filed Mar. 17, 2008).

[17] Petition of Sirius Satellite Radio Inc. for Rulemaking, and Comments, IB Docket No. 95-91, at A-3 (filed Oct. 17, 2006).

[18] *See* WCS Reply Comments at 46-47.

level of at least -35 dBm. However, they concede that this assertion is not based on the performance characteristics of actual WCS user equipment.[19] In fact, the WCS Coalition has previously established that SDARS's claim simply is not correct.[20] To the contrary, the WCS Coalition has demonstrated by actual testing of WiMAX prototype receivers that WCS user devices are likely to overload when subjected to SDARS signals on the order of -44 dBm, even taking into consideration the separation between the SDARS terrestrial repeaters and the WCS bands.

9. SDARS claims that WCS "Offered Distorted Views of Other Allocations & Proceedings." WRONG!

It is XM and Sirius that have routinely distorted the record in other proceedings pending before the Commission, most significantly the AWS-3 proceeding. In a report by ATECS that the WCS Coalition filed ten days ago, ATECS establishes that the AWS-3 proceeding filings and others technical papers on which SDARS relies do not actually support the SDARS position because they are distinguishable and not determinative to the issues before the Commission here.[21] Specifically, ATECS establishes that "they are: 1) based on theoretical analyses without supporting measurement data; 2) narrowly focused on use cases that are unlike the WCS/SDARS condition; and/or 3) rely on measurements that use free standing antennas with no ground plane or reflective surface."[22]

10. SDARS claims that WCS "Vaguely Described Burst Power Level Measurements." WRONG!

The reports filed by the WCS Coalition speak for themselves and are anything but "vague." They provide far greater detail regarding the methodologies employed than the studies filed by XM and Sirius. To avoid any confusion, the WCS Coalition wishes to be clear – in conducting its testing, power levels were measured in accordance with accepted industry practices. The WCS Coalition will gladly provide the Commission staff with any further information it requests regarding the manner in which the WCS Coalition has taken any of the measurements that underlay its positions.

* * *

[19] *See* Sirius Comments, Ex. A at 10; XM Comments, Ex. A at 12.

[20] *See* WCS Coalition Reply Comments at 23-26.

[21] *See* Letter from Paul J. Sinderbrand, Counsel to WCS Coalition, to Marlene H. Dortch, FCC Secretary, WT Docket No. 07-293 *et al*, Attachment at 7-9 (filed May 13, 2008).

[22] *Id*.

Pursuant to Sections 1.1206(b)(1) and 1.49(f) of the Commission's Rules, this letter is being filed electronically with the Commission via the Electronic Comment Filing System. Should you have any questions regarding this presentation, please contact the undersigned.

Respectfully submitted,

/s/ Paul J. Sinderbrand

Paul J. Sinderbrand

Counsel to the WCS Coalition

Attachment

cc : Helen Domenici
Julius Knapp
Roderick Porter
Joel Taubenblatt
Ira Keltz
Ron Repasi
Geraldine Matise
Bruce Romano
Alan Stillwell
Robert Nelson
Roger Noel
Thomas Derenge
Linda Chang
David Hu
Stephen Duall
Steven Spaeth
Shabnam Javid
Jay Jackson
Moslem Sawez