

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

In the Matter of)	
)	
Amendment of Part 27 of the)	
Commission’s Rules to Govern the)	WT Docket No. 07-293
Operation of Wireless Communications)	
Services in the 2.3 GHz Band)	
)	
Establishment of Rules and Policies for the)	IB Docket No. 95-91
Digital Audio Radio Satellite Service in the)	GEN Docket No. 90-357
2310-2360 MHz Frequency Band)	RM No. 8610

REPLY COMMENTS OF NEXTWAVE WIRELESS INC.

NextWave Wireless Inc. (“NextWave”) hereby replies to comments made in the above-referenced proceeding by Sirius Satellite Radio Inc. (“Sirius”) and XM Radio Inc. (“XM”) that took out of context comments made by NextWave in the unrelated *AWS-3 NPRM* proceeding.¹ In the instant proceeding, the Federal Communication Commission (“FCC” or “the Commission”) seeks to establish a regulatory framework for Satellite Digital Audio Radio Service (“SDARS”) repeaters that will permit co-existence with the adjacent band operations of terrestrial Wireless Communications Service (“WCS”) licensees, including NextWave.² These

¹ *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, Notice of Proposed Rulemaking, 22 FCC Rcd 17035 (2007) (“*AWS-3 NPRM*”).

² *Amendment of Part 27 of the Commission’s Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band; Establishment of Rules and Policies for the Digital Audio Radio Satellite*

reply comments will focus solely on the mischaracterization by Sirius and XM of NextWave's comments in response to the *AWS-3 NPRM*. All other views of NextWave with respect to issues raised in the *Notice*, and comments filed in response to the *Notice*, will be addressed by the WCS Coalition of which NextWave is a member.

I. OVERVIEW

In its *AWS-3 NPRM* comments, NextWave made two recommendations regarding the establishment of new service and technical rules for an unassigned frequency band. Specifically, NextWave encouraged the FCC to: (1) implement the same licensing scheme and technical requirements for AWS-3 as those adopted for the 3.65 GHz band under which all licenses are granted a nationwide, non-exclusive license to use the band on a co-primary and technology-neutral basis; and (2) delete from the Commission's Part 27 rules, for all Part 27 licensees, outdated and incomplete comparative renewal language.³ NextWave's recommendation for the adoption of the 3.65 GHz "lightly-licensed"⁴ approach to AWS-3 is intended to assist the FCC in meeting a number of goals, including:

Service in the 2310-2360 MHz Frequency Band, Notice of Proposed Rulemaking and Second Further Notice of Proposed Rulemaking, FCC 07-215 (rel. Dec. 18, 2007) ("*Notice*").

³ Reply Comments of NextWave Wireless Inc., FCC 07-164, WT Docket No. 07-195, at 1 (filed Jan. 14, 2008) ("*NextWave AWS-3 Reply*").

⁴ The hallmarks of the 3.65 GHz licensing scheme are set forth in the 3.65 GHz Order, codified at Part 90, Subpart Z of the Commission's rules. Under such a scheme, interested users would be granted a nationwide, non-exclusive license to use the 2.1 GHz band on a co-primary basis. To alleviate potential interference problems that could arise if multiple parties were authorized to use the AWS-3 band, fixed and base stations would have to be registered in a common database to be established by the Commission. In addition, all devices using the band would be required to employ a contention-based protocol that can avoid co-frequency interference with devices using all other types of contention-based protocols.

- Making wireless spectrum available to all interested parties;
- Facilitating affordable broadband access nationwide;
- Alleviating the need for unpaired spectrum allocations below 3 GHz;
- Maximizing flexibility to enable the deployment of technologies in response to market demands;
- Providing economies of scale for multiband, multimode equipment that can operate in both the 3.65 GHz and AWS-3 bands; and
- Addressing interference concerns raised in the AWS-3 comments.⁵

In the instant proceeding, the adoption of a non-exclusive licensing scheme for either the SDARS or WCS frequencies is not under consideration. Both bands have been licensed through competitive bidding. The issue at stake here is how to strike the appropriate balance between two co-equal, licensed services given technological advancements and market changes that have occurred since the services were initially authorized. Therefore, the arguments made by NextWave in response to the *AWS-3 NPRM*, supporting implementation of a “lightly-licensed” regulatory framework for an unassigned block of 20 MHz of spectrum at 2.1 GHz, are not analogous to the matters under consideration in this *Notice*.

⁵ *NextWave AWS-3 Reply* at 3.

II. NEXTWAVE DID NOT ARGUE THAT MOBILE DEVICES OPERATING IN THE AWS-3 AND WCS BANDS SHOULD BE LIMITED TO 5-10 DBM MAXIMUM TRANSMIT POWER. INSTEAD, NEXTWAVE URGES THE COMMISSION TO USE REAL-WORLD OPERATING CONDITIONS, RATHER THAN MAXIMUM PERMITTED TRANSMIT POWER LEVELS, WHEN ANALYZING ADJACENT CHANNEL INTERFERENCE.

In their comments, Sirius and XM assert that NextWave's comments in response to the AWS-3 NPRM are relevant, generally, to issues of potential interference between operations in adjacent bands.⁶ Sirius and XM attempt to twist NextWave's AWS-3 NPRM comments to assert that NextWave recommended that mobile devices operating in the WCS band should be limited to 5-10 dBm. NextWave never argued in favor of such a limitation for either the AWS-3 or the WCS band. Comments about the appropriate regulatory framework for AWS-3 should not be taken out of context. While adjacent band interference issues must be addressed for both the SDARS and WCS bands and for the three AWS bands (AWS-1, AWS-2 and AWS-3), the situations are not analogous.

For example, NextWave proposed the adoption of the 3.65 GHz "lightly-licensed" approach for AWS-3 spectrum for reasons having nothing to do with interference mitigation. As stated earlier, NextWave supports this approach because, among other objectives, it would enable access to critical mobile spectrum by all interested parties, facilitate the development of economies of scale for equipment using contention-based protocols, and provide opportunities for the introduction of TDD-based technologies.

⁶ See Comments of Sirius Satellite Radio Inc., WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610, at 34 and n.99 (filed Feb. 14, 2008) ("*Sirius Comments*"); Comments of XM Radio Inc., WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM No. 8610, at 37 and n.82 (filed Feb. 14, 2008) ("*XM Comments*").

NextWave noted that an additional benefit of using the 3.65 GHz licensing scheme and technical rules for AWS-3 spectrum is mitigation of potential interference from mobile transmitters operating in the AWS-3 band to the AWS-1 or AWS-2 base transmit band. The power levels specified for the 3.65 GHz band, if applied to mobiles operating in the AWS-3 band, would be so low that no interference would be experienced by AWS-1 or AWS-2 mobiles.⁷ NextWave did not argue that application of the 3.65 GHz technical rules, including the transmit power levels, would be the only or most appropriate way to address interference concerns between AWS-3 and its neighbors. Rather, NextWave simply pointed out that an incidental benefit of using the 3.65 GHz “lightly-licensed” approach for AWS-3, rather than using another licensing scheme or technical rules, is decreased potential for adjacent band interference.

While NextWave did not advocate a particular transmit power limit for mobiles in the AWS-3 band for purposes of interference avoidance, it explained that combining the power limits in the 3.65 GHz rules (as applied to the AWS-3 band) with balanced link operation would result in a typical end-user device operating at a power limit of 5-10 dBm.⁸ This analysis corresponds with the WCS Coalition’s comments in this proceeding,⁹ which demonstrate that when balanced link operation in a cellular system operating under real-world conditions is taken

⁷ *NextWave AWS-3 Reply* at 5.

⁸ *Id.*

⁹ Comments of WCS Coalition, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357 and RM No. 8610 at 14-15 (filed Feb. 14, 2008) (“*WCS Coalition Comments*”).

into consideration, the operational power level for end-user devices will be significantly lower than the upper limit¹⁰ – a principle that the FCC also recognizes.¹¹

In the case of NextWave's AWS-3 proposal, it was estimated that the typical transmit power of a mobile would be in the 5-10 dBm range, which is significantly lower than the 23 dBm upper limit that is the equivalent of the proposed spectral density limit of 40 mW/MHz EIRP.¹² The same principle applies to mobiles operating in the WCS bands. The WCS Coalition's analysis shows that under real-world conditions, WCS mobiles will typically transmit at much lower levels than the maximum allowable. As a result, the interference potential to SDARS is significantly less than a worst-case analysis based on maximum transmit power would indicate.¹³

Therefore, contrary to the assertions by Sirius and XM, NextWave has not argued that mobile devices operating in either the AWS-3 or the WCS band should be limited by regulation to 5-10 dBm maximum transmit power. NextWave does assert, however, that under real-world operating conditions, mobile devices typically transmit at significantly lower power levels than the maximum authorized and that these typical performance characteristics should be considered in interference analyses between AWS-3 and AWS-1/AWS-2 as well as between WCS and SDARS.

¹⁰ *Id.* at 15.

¹¹ *Unlicensed Operation in the Band 3650–3700 MHz; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band; Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band*, Notice of Proposed Rulemaking, FCC 04-100, at para. 49 (rel. Apr. 23, 2004) (noting that that handheld devices normally operate well below the maximum allowable limit due to battery power limitations and human exposure to RF radiation limitations).

¹² *NextWave AWS-3 Reply* at 7.

III. NEXTWAVE’S SUGGESTION THAT CONTENTION-BASED PROTOCOLS COULD BE USED TO MITIGATE INTERFERENCE IN THE AWS-3 BAND IS NOT INDICATIVE OF THE VIABILITY OF MODIFYING WCS MOBILE RECEIVER DESIGN TO TOLERATE HIGH-POWER SDARS REPEATER TRANSMISSIONS.

A second mischaracterization of NextWave’s comments in the AWS-3 proceeding relates to the use of a contention-based protocol (“CBP”) to mitigate adjacent band interference. In its comments, XM states that NextWave’s proposal to adopt the CBP requirement from the 3.65 GHz rules for the AWS-3 band is somehow evidence of the feasibility of incorporating “inexpensive, commercially available, widely used components” in a mobile receiver design in order to prevent interference from occurring “among devices employing dissimilar uses of spectrum.”¹⁴ This is a gross over-simplification of NextWave’s proposal regarding the utility of CBP in mitigating adjacent channel interference in the AWS-3 context as well as the potential for interference to a WCS receiver from a high-powered SDARS repeater.

In response to the *AWS-3 NPRM*, NextWave’s proposal was to take advantage of the CBP requirement in the 3.65 GHz rules, which was designed to mitigate co-channel interference, by adapting the spectrum sensing capabilities of a CBP to periodically check energy levels in adjacent bands prior to transmission and adjust transmit levels if the potential for harmful interference were detected. NextWave reasoned that the capabilities necessary to meet a requirement designed for co-channel interference in a non-exclusively licensed band could be leveraged to mitigate interference potential to adjacent, exclusively-licensed bands in which two-

¹³ *WCS Coalition Comments* at 15.

¹⁴ *XM Comments* at 24 and n.44.

way, cellularized technologies were used. NextWave anticipates that extending the 3.65 GHz CBP requirements to the AWS-3 band will provide greater economies of scale for equipment incorporating this capability and that adjustments to the CBP for adjacent band interference mitigation are conceptually feasible.

NextWave's CBP proposal for the AWS-3 band is simply not analogous to the claims by XM that WCS mobile receivers can be easily or inexpensively modified to tolerate high-powered SDARS repeater transmissions in close proximity. In its comments, XM incorrectly states that NextWave argued for the imposition of minimum equipment standards for the AWS-3 band and that, were this assertion true, NextWave's proposal somehow supports the imposition of Automatic Gain Control (ACG) in WCS receiver design in order to protect WCS receivers from grandfathered high-powered SDARS repeaters.¹⁵ XM's assertion is misleading for multiple reasons.

First, NextWave did not argue for the imposition of minimum equipment standards in the AWS-3 band. Rather, NextWave again pointed out an incidental benefit of applying the 3.65 GHz "lightly-licensed" rules to the AWS-3 band. While the use of CBP is helpful to mitigate interference among co-channel users in a non-exclusively licensed band, it also has attributes that, if adjusted, may address concerns raised regarding the potential for adjacent channel interference. Similar to the mischaracterization of NextWave's comments regarding the practical impact of the 3.65 GHz transmit power limits, NextWave did not suggest that implementing CBP was the best or only way to address adjacent band interference in the AWS-3 band. NextWave

¹⁵ *Id.*

did argue, however, that its preferred regulatory framework for the AWS-3 band has supplementary benefits from the standpoint of adjacent band interference mitigation.

Second, XM claims that the inclusion of “inexpensive AGC circuitry in WCS receivers, which [XM] understand[s] is likely to be the case, will mitigate most interference from SDARS repeaters,”¹⁶ and that this justifies the grandfathering of high-power SDARS repeaters.

NextWave agrees that most WCS receivers will include AGC to avoid both intra- and inter-WCS system interference. However, as Sirius pointed out in its 2006 White Paper, the use of AGC will not prevent overload and loss of service when “an undesired signal (or signals) from an adjacent frequency band is sufficiently strong to cause the Automatic Gain Control (AGC) system of the desired signal’s receiver to respond to the undesired signal rather than the desired signal.”¹⁷ Given that even Sirius acknowledges that practical limits of state-of-the-art filter technologies “offer very little relief for this type of interference,”¹⁸ XM’s claims that implementation of AGC in WCS receivers will address overload from high-powered SDARS repeaters are not credible.

NextWave’s recommendation that the 3.65 GHz band rules be applied to AWS-3 does not support the assertion by XM that WCS mobile receivers can be easily or inexpensively modified to tolerate high-powered SDARS repeater transmissions in close proximity. As such,

¹⁶ *Id.*

¹⁷ Letter from Carl R. Frank, Counsel to Sirius Satellite Radio Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, File No. 0002240823, DA 05-1662, WT Docket No. 05-256, WT Docket No. 03-264, IB Docket No. 95-91, Attachment, “White Paper: Interference to the SDARS Service from WCS Transmitters,” at 13 (filed Mar. 29, 2006).

¹⁸ *Id.*

the glaring mischaracterizations of NextWave's proposal to implement the 3.65 GHz regulatory framework, including the use of CBP, in the AWS-3 band, should be ignored.

IV. CONCLUSION

In conclusion, NextWave's arguments in the AWS-3 proceeding are either not applicable to the matters under discussion here or, in fact, bolster the WCS Coalition's analysis regarding the need for real-world operating parameters to be considered in an analysis of interference potential. Therefore, NextWave respectfully requests that the Commission adopt the technical proposals made by the WCS Coalition in this proceeding, recognizing that they strike an appropriate balance between SDARS and WCS that will keep interference to both services to tolerable levels, while enabling the deployment of viable mobile broadband services in the WCS bands.

Respectfully submitted,

/s/ Jennifer M. McCarthy
Jennifer M. McCarthy
Vice President, Regulatory Affairs
NextWave Wireless Inc.
975 F St., NW
Suite 520
Washington, DC 20004
(858) 480-3441

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