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FOURTH FURTHER NOTICE OF PROPOSED RULE MAKING
Adopted: August 17, 2012 Released: August 17, 2012

In the Matter of Improving Public Safety Communications in the 800 MHz Band

New 800 MHz Band Plan for U.S. – Mexico Sharing Zone

COMMENTS
(Filed on September 26, 2012)

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I wish to preface my comments by stating that while a Senior Staff Engineer with the Motorola iDEN team, I was involved in the development and optimization of the Nextel MIRS/iDEN system from its inception, also responding to the first and subsequent high profile cases of 800 MHz public safety RF interference that ultimately evolved into the FCC's 800 MHz rebanding program. I worked with Nextel and Sprint-Nextel and with public safety agencies for many years, identifying 800 MHz iDEN RF interference and assisting Nextel (and later Sprint-Nextel) in developing their program of responding to specific public safety interference complaints, documenting these incidents, and effecting targeted technical solutions that were often in the form of costly ceramic auto-tune transmitter combiners for iDEN sites. I am a member of APCO International and CPRA as a Senior Member and the CPRA 800 MHz rebanding advisor.

II. BACKGROUND, Para. 4

U.S. and Mexican licensees may operate on channels in the other country's primary spectrum provided they do not exceed the specified maximum signal strength at any point at or beyond the border.

In several locations, Nextel International (NII) operates Mexican border iDEN systems with antennas oriented northward into the U.S. to facilitate roaming Mexican subscriber mobiles that operate in the U.S. border regions. Though this U.S./Mexico border agreement limits base station signal strength at the border for sharing zones, it may still be possible for Mexican cellular-like carriers to illuminate nearby high-rise buildings and developed hills northward into the U.S. which could pose localized RF interference problems for U.S. public safety licensees in these areas, producing harmful *uplink interference* from Mexican subscriber radios in the U.S. attempting to affiliate.

The Rules must be clearly stated where bi-directional amplifiers and in particular, mobile coverage boosters are controlled and/or prohibited for use on the sharing channels in the border area, as undesired, uncontrolled and harmful coverage extension may occur.

Para. 5 The spectrum reapportionment under the Amended Protocol will require some incumbent operators in the Mexican portion of the Sharing Zone to relocate out of spectrum that is being converted from Mexico primary to U.S. primary status. These Mexican operators will relocate either to replacement channels in the new Mexico primary band segment or to non-800 MHz channels. In some instances, these relocations will need to be coordinated with relocations on the U.S. side to ensure an orderly transition. The Amended Protocol provides for a joint U.S. – Mexico task force to coordinate transition of incumbent licensees on both sides of the border to new channels consistent with the band plan specified in the Amended Protocol. The Amended Protocol also provides that licensees operating in the co-primary spectrum block will be responsible for covering the reasonable relocation costs of Mexican incumbents.

I raise three concerns with respect to the proposed plan in Para. 5 above:

What is the composition of the joint U.S. – Mexico task force? Will these participants be Sprint, NII, and government officials from both countries, and will U.S. public safety interests have any representation and input?

What is the (expedient) remedy for a U.S. incumbent should a Mexican licensee only relocate some of its spectrum at one time instead of all of their spectrum as required by international agreement? The impact to a U.S. public safety incumbent could be that reprogramming of their 800 MHz radio fleet may have to be accomplished several times, at considerable disruption to operations and at additional re-negotiated cost to Sprint.

What is the (expedient) process to resolve international business disagreements between co-primary spectrum block licensees should there be a ‘reasonable relocation costs’ dispute, further delaying the reconfiguration program?

9. We caution that in some cases there is likely to be little room for adjustment to the channel plan we propose below due to the limitations on spectrum use in the Sharing Zone combined with the requirement to accommodate all incumbent licensees within a region with comparable post-rebanding replacement channels. Nonetheless, we seek comment on any alternatives to our proposals below. We also seek comment from individual licensees on any particular factors that they believe should be considered when assigning replacement channels, e.g., the need for channels with a wide emission mask to accommodate data systems.

Incumbents and Sprint-Nextel should be prepared to at least consider 700 MHz as a whole or part solution to lack of availability of sufficient 800 MHz Sharing Zone channels, as was done in Riverside County, California recently. This of course, would likely require the pre-negotiated replacement of all radio equipment at a greater cost to Sprint-Nextel.

3. Channel Plan for NPSPAC Region 5 (Southern California)
NPSPAC Region 5 encompasses Southern California and is the most congested public safety region along the U.S.-Mexico border. The southern portion of the region — approximately one-third of the region's total geographic area —is included in the Sharing Zone. The remaining two-thirds of the region, which includes most of Los Angeles and Orange Counties, is outside the Sharing Zone. Because of the large number of incumbent 800 MHz licensees operating in this region, we propose establishing the channel plan depicted in Appendix C-5 for Region 5 licensees located outside the Sharing Zone. This proposed channel plan is identical to the channel plan for non-border 800 MHz regions, ***except that in the 815-817/860-862 MHz band segment we do not propose to establish an Expansion Band or Guard Band in NPSPAC Region 5.*** *We tentatively conclude that eliminating the Expansion and Guard Bands is necessary to accommodate the large number of non-ESMR incumbents in Region 5. This proposed channel plan is also intended to maximize use outside the Sharing Zone of channels that are primary to Mexico inside the Sharing Zone, so as to avoid creating co-channel conflicts within the region while accommodating all incumbent licensees on post-rebanding replacement channels.*

The proposed U.S./Mexico border area 800 MHz spectrum reconfiguration plan does not adequately address the significant potentially greater interference impacts from cellular-like CDMA carriers (unlike discrete narrowband iDEN TDMA carriers) where the proposed reconfigured 800 MHz spectrum guard band has been eliminated to accommodate a maximum number of new channels. Broadband transmitter RF filtering as proposed by Sprint would not adequately suppress all common forms of CDMA out of band and adjacent channel interference as it focuses on transmitter harmonic mixing of CDMA carriers and rejection of CDMA transmitter sideband noise but fails to address the significant potential for public safety interference from complex external transmitter mixing on shared high high-density radio sites. The worst case radiated RF interference could be from a combination of Sprint CDMA and close-proximity UHF television and FM transmitters. The result would be very wideband RF interference (up to 20 MHz wide) in the form of high amplitude incoherent noise and noise floor masking. Probable solutions for such common scenarios would include both customized CDMA transmitter filtering and customized radio site redesign. There is also a likely potential for RF interference to public safety where BDA's are

swamped by strong CDMA carriers that are close spaced to public safety where no guard band is present for spectral isolation. I recommend considerably more technical investigation into 'real world' interference prevention solutions and that the guard band be maintained for improved protection of public safety communications.

B. Implementation Issues

We now turn to the sequencing and timing of rebanding activity along the U.S.-Mexico border. Once we have adopted a final channel plan for the border region, the TA will assign replacement channels to licensees that must retune their systems, and the transition period will begin for licensees to develop their reconfiguration plans, negotiate Frequency Reconfiguration Agreements (FRAs) with Sprint, and complete the rebanding process. We further anticipate that rebanding in the border region will proceed in stages and will require close coordination with Mexican operators that must relocate under the Amended Protocol. As discussed in greater detail below, we propose a 30-month transition period for the rebanding process in the border region, which would begin 60 days after the effective date of an order establishing the border area channel

The proposed 30 months transition period may be greatly optimistic. A significant concern would be that after Wave 1, 2, and 3 rebanding are completed and several years elapse before Wave 4 U.S. - Mexico border incumbents can actually proceed with rebanding, it could be difficult to lineup qualified service providers to actually perform the work. There may also be extended delays in obtaining replacement base station equipment, antennas, and RF filters and combiners as there will be a large number of incumbents suddenly competing for available services and products. As had occurred numerous times in Waves 1, 2, and 3, the FCC will likely issue deadline extensions time and again.

What is the (expedient) remedy for a U.S. incumbent should a Mexican licensee only relocate some of its spectrum at a time instead of all of their spectrum as required by international agreement? The impact to a U.S. public safety incumbent could be that reprogramming of their 800 MHz radio fleet may have to be accomplished several times, at considerable disruption to operations, delays in implementation, and at additional re-negotiated costs to Sprint.

31. As we have done in non-border regions and the Canadian border region, we also propose to allow licensees in the Mexican border region to negotiate with Sprint for a system upgrade whereby the licensee upgrades its system, Sprint pays the licensee the amount that it otherwise would have paid for rebanding to comparable facilities, and the licensee pays the additional cost of the upgraded system from its own funds. We propose that any licensee seeking such an upgrade notify the TA and Sprint, in writing, no later than the due date for submission of its cost estimate. The notice, which is subject to TA approval, must

describe the nature of the upgrade, the cost, the source of funds, and the implementation schedule. We seek comment on our proposed policy regarding system upgrades. We note that upgrade proposals are given close scrutiny by the TA to ensure that the upgrade will not delay the rebanding schedule and that the upgrade funds are demonstrably available. Licensees contemplating an upgrade should consult the TA's upgrade guidelines.

For to the discussion of rebanding system upgrades, it is strongly recommended that public safety agencies begin dialogues and develop proposals immediately within their organizational structure to assure rebanding upgrade funding availability when needed. As these processes can involve months of meetings and presentations and internal studies, last-minute matching funds requests from the parent agency may delay rebanding beyond the FCC's allowable action period.

3. Stages and Steps for Completing Rebanding

33. We propose a two-stage approach to rebanding along the U.S.-Mexico Border similar to the process we have implemented in non-border regions and along the Canadian Border. Under our two stage approach, B/ILT, non-cellular SMR, and public safety licenses on pool channels would retune first during Stage 1 and NPSPAC licensees would retune later during Stage 2. Below we describe in detail our proposal for the steps that would need to take place during each stage of the process. In proposing this staged approach, we seek to minimize disruption to all licensees. Nonetheless, some U.S. licensees along the U.S.-Mexico border may be need to retune certain frequencies twice in order to complete the rebanding process because of the need to coordinate frequency re-tunes with incumbents in Mexico and to clear the 130 pool channels immediately above the new NPSPAC band within the Sharing Zone. Further, some licensees may be unable to retune to all of their replacement channels at the same time. Consequently, these licensees will need to retune to their replacement channels in stages.

What is the (expedient) remedy for a U.S. incumbent should a Mexican licensee only relocate some of its spectrum at a time instead of all of their spectrum as required by international agreement? The impact to a U.S. public safety incumbent could be that reprogramming of their 800 MHz radio fleet may have to be accomplished several times, at considerable disruption to operations, delays in implementation, and at additional re-negotiated costs to Sprint.

a. Sharing Zone

34. In the Sharing Zone, transition to our proposed post-rebanding channel plan will require close coordination with licensees across the border in Mexico and among licensees on the U.S. side of the border. When U.S. licensees in non-border regions implement rebanding, they typically retune to replacement channels vacated by Sprint. In the Sharing Zone, however, some licensees will be able to retune to replacement channels only after one or more Mexican licensees have vacated channels on the other side of the border. Also, licensees converting from offset to standard channels may have to wait for clearing by more than one licensee on the U.S. side of the border. In many cases, the vacating licensee will be Sprint or Sprint's roaming partner in Mexico—Nextel Mexico. Below we detail the steps we envision will need to occur in Stages 1 and 2 within the Sharing Zone in order to transition to our proposed channel plan.

What is the (expedient) remedy for a U.S. incumbent should a Mexican licensee only relocate some of its spectrum at a time instead of all of their spectrum as required by international agreement? The impact to a U.S. public safety incumbent could be that reprogramming of their 800 MHz radio fleet may have to be accomplished several times, at considerable disruption to operations, delays in implementation, and at additional re-negotiated costs to Sprint.

C. Additional Issues

37. Special Coordination Procedure Channels. Sprint currently operates on certain Mexico primary channels in the Sharing Zone pursuant to a Special Coordination Procedure (SCP). Sprint's operation on these channels facilitates cross-border roaming with Nextel Mexico. Under the Amended Protocol, however, all Mexico primary channels are below 818.5/863.5 MHz, and thus are below the band segment in which ESMR will be allowed in the U.S. under the post-reconfiguration band plan. Consequently, we seek comment on whether to require Sprint to vacate Mexican primary channels in the Sharing Zone or to allow Sprint to continue operating on these channels to support cross-border roaming under a revised SCP after band reconfiguration, and, if so, under what circumstances. If we allow Sprint to continue using these channels even though they are below the ESMR line, are there conditions or limitations that we should apply? We note that under similar circumstances along the Canadian border, we permitted Sprint to operate on Canada primary channels below the ESMR line provided that Sprint maintained at least one megahertz of separation from the highest Canada primary channel used by a U.S. public safety licensee. Would a similar restriction be appropriate for Mexico primary spectrum?

In several locations, Nextel International (NII) operates Mexican border iDEN systems with antennas oriented northward into the U.S. to facilitate roaming Mexican subscriber mobiles that operate in the U.S. border regions. Though this proposed U.S. - Mexico border agreement limits Mexico base station signal strength at the border for sharing zones, it may still be possible for Mexican cellular-like carriers to illuminate high-rise buildings and hills northward into the U.S. which could pose localized RF interference problems for U.S. public safety first responders in these areas, producing harmful uplink interference from Mexican subscriber radios in the U.S. attempting to affiliate.

The Rules must be clear that bi-directional amplifiers and in particular, mobile (unlicensed) coverage boosters are controlled and/or prohibited for use on the sharing channels in the border area, as undesired, uncontrolled and harmful coverage extension may occur.

38. Vehicular Repeaters. Many licensees in the 800 MHz band use vehicular repeater stations (VRS) to extend radio coverage. VRS units, which are mounted inside public safety vehicles, extend or improve radio coverage from hand-held units to distant base station repeaters and are most frequently used to provide in-building coverage. For example, when a public safety official exits a vehicle to enter a building, he or she tunes a hand-held unit to transmit on the input frequency of the VRS unit, which then relays the signal to a distant repeater on a separate mobile frequency. VRS operations, however, require a relatively large spectral separation between their input and output frequencies. We seek comment on whether the channel plan we propose for the Mexico border region will provide licensees operating VRS units with the spectral separation necessary to continue VRS operations, and any alternative approaches to achieve the required separation that are consistent with the Amended Protocol and the Commission's 800 MHz rebanding objectives. For example, could VRS units be retuned to transmit on channels primary to Mexico in the Sharing Zone in order to create the proper spectral separation between the input and output frequencies of these units?

As is currently implemented with the California Highway Patrol, VRS units can effectively be operated on 700 MHz. Most public safety quality portable subscriber radios can now be obtained with combinations of 700 MHz and one or more other traditional bands, making it quite simple to obtain portable radios that would operate VRS units and also other public safety systems.

39. Power Loss in Combiners. Due to the limited availability of channels in some areas under the Amended Protocol and our proposed Mexico border channel plan, it may be difficult to spectrally separate the replacement channels assigned to some licensees. This reduced spectral separation could (cause licensees that use combiners in their current systems to experience power loss in the combiners. We propose allowing such licensees to recover from Sprint the reasonable costs associated with mitigating the impact of reduced spectral separation on combiner power. Mitigation steps could include new combiners, related antennae system changes, tower work, and other associated costs, converting operations from standard pool channels to NPSPAC channels, or vice versa. We seek comment on this proposal.

RF power combining losses can sometimes be adequately reduced by employment of high-quality cavity filters or use of hybrid combiners with low-loss post filtering. Antenna changes in many cases may not even be an option. Some existing towers may not have space for additional single antennas, or local zoning laws may prohibit additional antennas. Commercial leased tower space will likely include the cost of the additional new antenna(s) and additional tower space lease costs that run for perpetuity. Would Sprint-Nextel continue to pay for additional leased antenna tower space, and for how many years? Multiple antennas in one radome weigh considerably, possibly requiring relocation to reinforced portions of the tower. Multiple antennas in one radome can be problematical, where similar stacked antennas within a single radome can exhibit greatly different actual performance characteristics. Where simulcast transmitters are concerned, misapplied changes in antenna types can result in serious system performance degradation.

***ADDITIONAL ISSUES – REBANDING RELATED NEW CRITICAL ISSUE**

Waves 1, 2 and 3 have mostly completed their 800 MHz rebanding activities and Wave 4 can now proceed thanks to the U.S. - Mexico treaty agreement signed on June 8, 2012, defining the protocol to complete this final segment of a crucial effort to resolve serious public safety interference that was first recognized and characterized in the early 1990's. Considerable work has been accomplished by both the U.S. and Mexico to finally bring 800 MHz U.S. - Mexico border rebanding to a workable conclusion. There is however, one substantial remaining problem that has not been recognized but must promptly be addressed, which wasn't a concern in Waves 1, 2, or 3. This is a matter of timing, concerning the recent announcement by Sprint-Nextel that it will decommission the domestic 800 MHz and 900 MHz iDEN network on June 30, 2013. Public safety 800 MHz in-building portable communications may be wholly supported by some of the Nextel-owned BDA systems in public places such as airports, shopping malls, city halls and public safety buildings, jails, and vehicle tunnels, to name a few.

Many of these BDA installations occupy private lease space where Nextel pays monthly space rental fees (some are substantial). Sprint is decommissioning the 800 MHz iDEN system which includes possibly hundreds of BDA's in public spaces in that these BDA's may not support CDMA and would likely require at minimum, new costly bandshape filters. Sprint may elect to deactivate many of these BDA's or replace them with devices that roll-off the new public safety spectrum frequency blocks. The critical date of June 30, 2012 will likely create a special problem for Wave 4 border impacted incumbents (the last group to reband), as if Nextel terminates BDA service at these locations on June 30, 2012 as scheduled, incumbents who file RFPF's and seek PFA's after this date may find that Sprint will reject any claims for 'comparable facilities' as (1) Sprint and not the incumbent owned the BDA's, and (2) the BDA service was cancelled prior to the RFPF filing date where Sprint may say that there is no evidence of a 'comparable facility' as no such equipment was in operation by or in behalf of the public safety incumbent at the time of RFPF filing.

To add another layer of complexity to this matter, (3) it is unlikely in this difficult economic time for local government that few if any agencies could manage to renegotiate new public space BDA lease agreements, purchase costly new BDA equipment, and make monthly ongoing space lease payments. The FCC, the TA, and the public safety community must promptly address these concerns with Sprint-Nextel to determine the level of risk and potential for a loss of critical in-building coverage after June 30, 2013, also testing how Sprint is going to react to this pending costly public safety communications issue.

D. Cost Benefit Analysis

41. We believe that the benefits of our proposal for establishing and implementing a reconfigured 800 MHz channel plan along the U.S.-Mexico border outweigh any potential costs. This proposal is part of the FCC's rebanding effort to eliminate interference to public safety and other land mobile communication systems operating in the band by addressing its root cause and separating generally incompatible technologies. The homeland security obligations of the Nation's public safety agencies make it imperative that their communications systems are robust and highly reliable. The changes proposed herein will further that goal by separating—to the greatest extent possible—public safety and other non-cellular licensees from licensees in the band that employ cellular technology. Furthermore, Sprint, the major commercial provider in the band, will benefit from the changes proposed herein by obtaining contiguous spectrum at the end of the program on which it will be able to transition to advanced wireless technologies. Moreover, the costs are further justified in this case because Sprint will be responsible for paying the reasonable costs of retuning incumbent licensees to comparable facilities on their replacement channels. Furthermore, Sprint has received equitable compensation for the costs it will incur in the form of spectrum rights to the 1.9 GHz band.70 We therefore conclude that the changes proposed herein outweigh any potential costs.

The ‘separation of incompatible technologies’ must further consider the large potential interference impacts to public safety from CDMA carriers adjacent to public safety frequencies, without a guard band.

When cost and comparable facilities negotiating with Sprint, our incumbents will be sure to quote the FCC in its statement that “*Furthermore, Sprint has received equitable compensation for the costs it will incur in the form of spectrum rights to the 1.9 GHz band. We therefore conclude that the* ***changes proposed herein outweigh any potential costs.”***
