June 3, 2004

BY ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: WT Docket No. 03-66
Ex Parte Presentation

Dear Ms. Dortch:

On Wednesday, June 2, 2004, Nextel Communications, Inc. ("Nextel") met with members of the Wireless Telecommunications Bureau and International Bureau regarding the above-referenced proceeding. Attending on behalf of Nextel were Michael Ha, Technology Strategist and the undersigned. Attending on behalf of the Federal Communications Commission ("FCC") were Uzoma Onyeije, Legal Advisor, Office of the Bureau Chief; Tom Stanley, Chief Engineer of the Wireless Bureau; John Schauble, Deputy Chief, Broadband Division; Henry A. Allen, Broadband Division; Stephen Zak, Broadband Division and Richard Engelman, Chief Engineer of the International Bureau.

During the meeting, Nextel discussed the status of the Commission's consideration of various technical and policy issues in this proceeding, specifically the Commission's existing and proposed technical rules to protect future MMDS/ITFS operations from in-band and adjacent out-of-band operations. During the meeting, Nextel discussed the attached technical presentation.

As described in the technical presentation, Nextel supports the Wireless Communications Association's ("WCA") previous comments in this proceeding that 43+10 log P should be used as the FCC certification mask for both base station and mobile stations. Further, Nextel believes that the other additional out-of-band emission ("OOBE") limits proposed by WCA should adequately protect adjacent operators from interference within the band. Nextel also noted that WCA's original "white paper" and subsequent comments struck the appropriate balance between the need for flexibility in adjacent operations and protections against interference from potentially incompatible technologies within the same band.

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Nextel also expressed concern that the Commission not impose an emission mask at the edge of a new MMDS/ITFS allocation below 2500 MHz that 2.5 GHz mobile devices would be unable to meet. Therefore, Nextel advocated retention of the Commission's current balancing of interests at a realigned band edge between MMDS/ITFS and the Mobile Satellite Service ("MSS") as codified in Section 25.255 of the Commission's Rules (i.e., 43 + 10 log P).

Based on these staff discussions, it appears that the Commission is planning to relocate incumbent MDS operations from the 2.1 GHz band at 2150-2162 MHz into the MMDS/ITFS band at 2.5 GHz. Nextel applauds the Commission for seeking to resolve the previously uncertain fate of 2150-2162 MHz incumbent MDS licensees by relocating them to the 2.5 GHz band. Through its recent acquisitions of spectrum licenses from WorldCom and Nucentrix, Nextel has become the licensee of MDS and MMDS spectrum across the country, and therefore, is uniquely impacted by the relocation of MDS Channels 1 and 2. Relocating MDS licensees to the 2.5 GHz band groups similar commercial operations together and promotes service deployment. In addition, relocating MDS Channels 1 and 2 to the 2.5 GHz band removes a substantial pending issue from the Commission's ongoing 1.7 GHz proceeding, which should hasten access to 90 MHz of advanced wireless spectrum for the commercial mobile radio service ("CMRS") community.

Nextel believes that the optimum relocation location for the MDS channels is to relocate MDS Channel 1 to the middle of the proposed Lower Band Segment ("LBS") adjacent to Channel A3, and to relocate MDS Channel 2 to the middle of the Upper Band Segment ("UBS") adjacent to Channel E3 in a *de facto* paired allocation. Placing the MDS channels immediately adjacent to blocks of realigned MMDS commercial spectrum provides the greatest flexibility for commercial operators in a realigned 2.5 GHz band and does no harm to existing licensees.

In conjunction with relocating MDS Channels 1 and 2 to the middle portions of the LBS and UBS, Nextel recommends a modification to the 2.5 GHz band plan that will spur advanced wireless deployment of MMDS/ITFS spectrum. As demonstrated on the attached diagram, the Commission should relocate one group of MMDS channels (H1, H2 and H3) and place that spectrum in the LBS to create a *de facto* pairing with MMDS Channels F1, F2, and F3.[1]

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[1] Based on our discussions with the Wireless Bureau, it appears that the Commission is considering reducing the J and K channels from the WCA proposed 6 MHz blocks to 4 MHz blocks. The Commission should reallocate 0.5 MHz from incumbent MDS Channels 1 and 2 to enlarge the transition or guard band channels (J and K) to 4.5 MHz to provide additional protections to licensees on both sides on the Middle Band Segment ("MBS"). The MBS would still provide for high-site, high-power operations and Channels G4, F4 and E4 would remain "on channel."

The WCA/CTN/NIA proposed band plan does not contain paired spectrum for commercial MMDS operators. This means that a commercial MMDS operator desiring to deploy an FDD technology must contract with an incumbent ITFS licensee to create the paired spectrum necessary for that service. Thus, the proposed band plan creates pressure on the Commission to grant "open eligibility" for ITFS licensees to enable commercial licensees to purchase ITFS channels to assure themselves of having access to paired spectrum for commercial services. A better solution is to relocate a group of MMDS channels from the upper band segment to the lower band segment, thereby enabling commercial licensees to control their own destiny by acquiring paired spectrum. Enabling commercial providers to more readily obtain paired spectrum will reduce "time-to-market" and thereby facilitate the introduction and availability of competitive service offerings in the 2.5 GHz band. It also lessens the need for commercial operators to "own" ITFS spectrum, thereby reducing the need for the Commission to address "ITFS open eligibility" at this time – a difficult and controversial issue in this proceeding.

Nextel believes that fully integrating the relocated MDS spectrum with MMDS and ITFS spectrum in a realigned 2.5 GHz band plan provides the best opportunity for widespread deployment of advanced wireless services within the 2.5 GHz band.

Pursuant to section 1.1206(b)(2) of the Commission's rules, 47 C.F.R. § 1.1206(b)(2), this letter is being filed electronically for inclusion in the public record of the above-referenced proceeding.

Sincerely,

/s/ James B. Goldstein

James B. Goldstein
Senior Attorney – Government Affairs
Nextel Communications

cc: John Muleta
Uzoma Onyeije
Tom Stanley
John Schauble
Henry A. Allen
Stephen Zak
Richard Engelman

2.5 GHz *Ex Parte* Presentation

Nextel Communications

WT Docket 03-66

June 2, 2004

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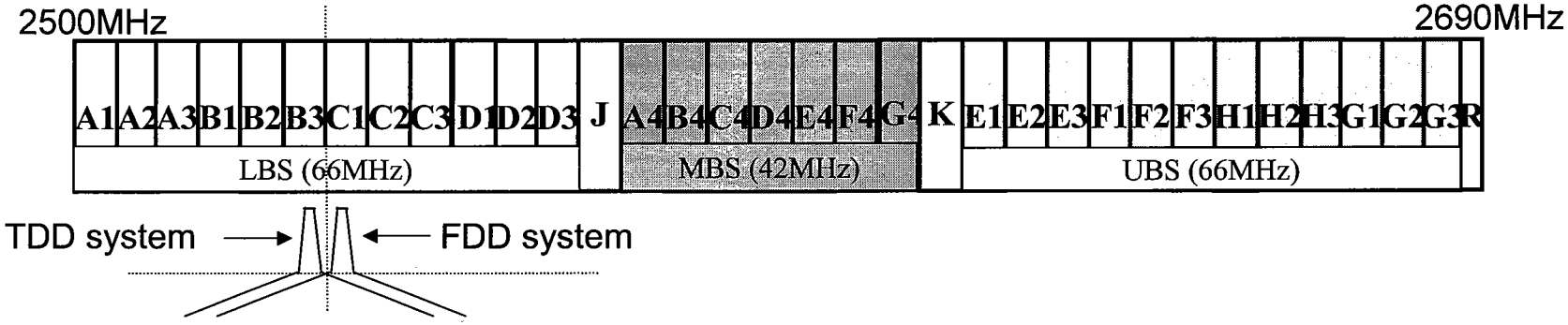
Purpose

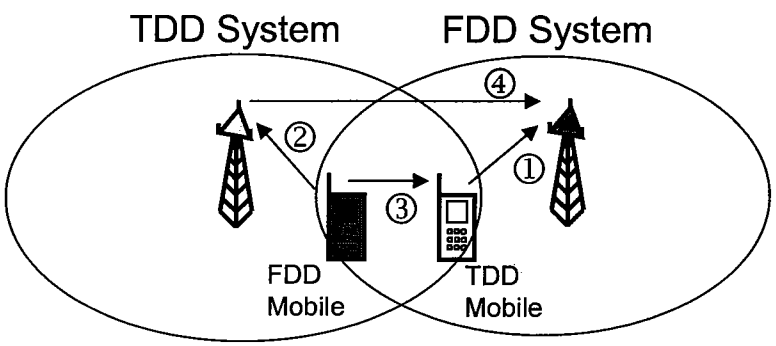
- The purpose of this presentation is:
  - To explain interference mechanisms between TDD/FDD coexistence
  - To illustrate that TDD and FDD operators could be either victim or interferer depending on relative location of its channel and that interference protection rules should equally apply to both TDD and FDD systems
  - To re-enforce adjacent and co-channel interference protection rules proposed by the WCA MMDS rebanding proposal
  - To illustrate emissions mask for base station and mobile stations as proposed by the WCA MMDS rebanding proposal.
  - As an illustrative example, demonstrate Nextel's success in the 800 MHz band in protecting 800 MHz cellular base station receivers from 800 MHz SMR base station transmitters (which is similar to TDD/FDD coexistence interference)
  - To demonstrate Nextel's experience on cellular handset transmitter interference into Nextel's 800 MHz handset receiver
  - To express our concern on overly tight emissions mask requirement for mobile station at the border channel with satellite systems.

Case 1: TDD Deployment in LBS



Assume TDD operates on B3 (both MS and BS transmit & receive on B3)

Assume FDD operates on C1 (MS transmits on C1; BS receives on C1)



There are four interference scenarios

① TDD MS transmitter interferes with FDD BS receiver
- This is identical to FDD/FDD allocation

② FDD MS transmitter interferes with TDD BS receiver
- This is identical to FDD/FDD allocation

③ **FDD MS transmitter interferes with TDD MS receiver**
- Certain conditions have to be met

④ **TDD BS transmitter interferes with FDD BS receiver**
- FDD base station will be severely interfered by TDD base station

FDD base station and TDD mobile station are the victims

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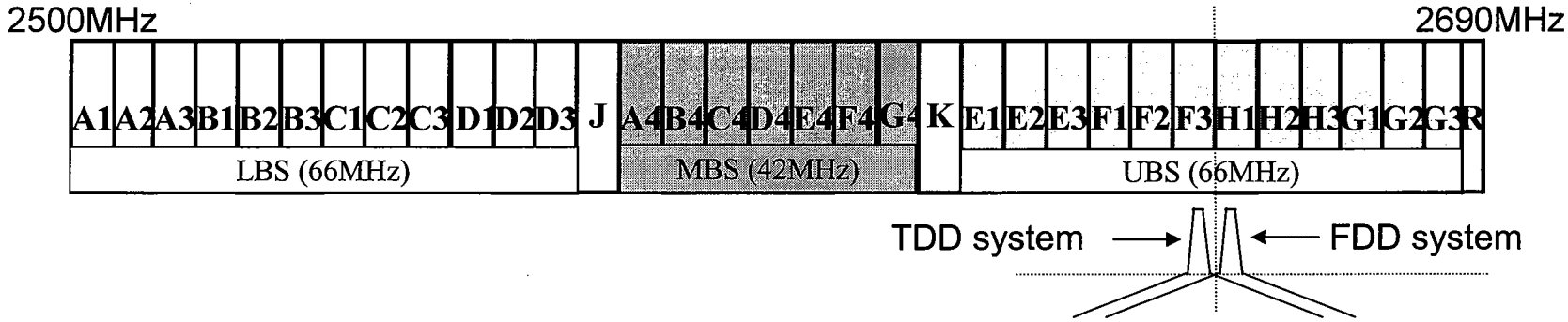
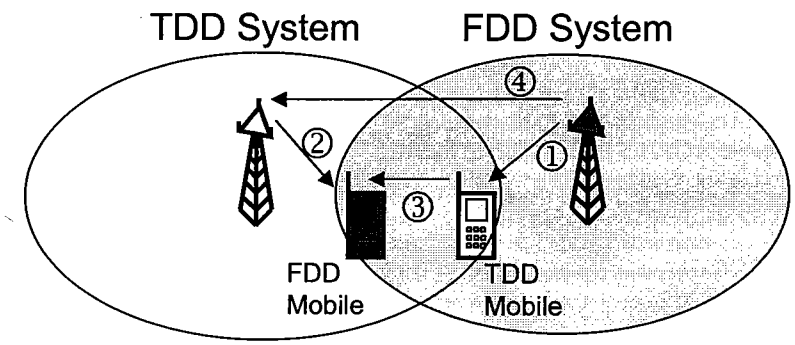
Case 2: TDD Deployment in UBS



Assume TDD operates on F3 (both MS and BS transmits & receives on B3)

Assume FDD operates on H1 (BS transmits on H1; MS receives on H1)



Again, there are four interference scenarios

① FDD BS transmitter interferes with TDD MS receiver
- This is identical to FDD/FDD allocation

② TDD BS transmitter interferes with FDD MS receiver
- This is identical to FDD/FDD allocation

③ **TDD MS transmitter interferes with FDD MS receiver**
- Certain conditions have to be met

④ **FDD BS transmitter interferes with TDD BS receiver**
- TDD base station will be severely interfered by FDD base station

This is reverse of Case 1 and TDD BS and FDD MS become the victims

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TDD/FDD Interference Mechanism

- Adjacent Channel Interference between Base Station and Mobile Station
  - This interference mechanism already exists in FDD allocation
  - Current cellular and PCS networks have proven that this can be addressed within the FCC's existing rules (i.e. 43+10*log P)
- Adjacent Channel Interference between FDD/TDD Base Stations
  - This interference mechanism does not exist in FDD allocation and introduced in TDD/FDD coexistence
  - This is highly deterministic and can be resolved by tighter emissions mask
  - Identical interference mechanism exists today between 800 MHz SMR and Cellular bands.
- Adjacent Channel Interference between FDD/TDD Mobile Stations
  - This interference mechanism does not exist in FDD allocation and introduced in TDD/FDD coexistence
  - This is highly probabilistic and all of the following conditions must occur:
    - Both mobile stations are in use simultaneously
    - Both mobile stations must be in a close proximity
    - Interfering mobile station must be transmitting at high power
    - Victim mobile station must be in a poor coverage (weak signal)
  - Identical interference mechanism exists today between 800 MHz SMR and Cellular bands

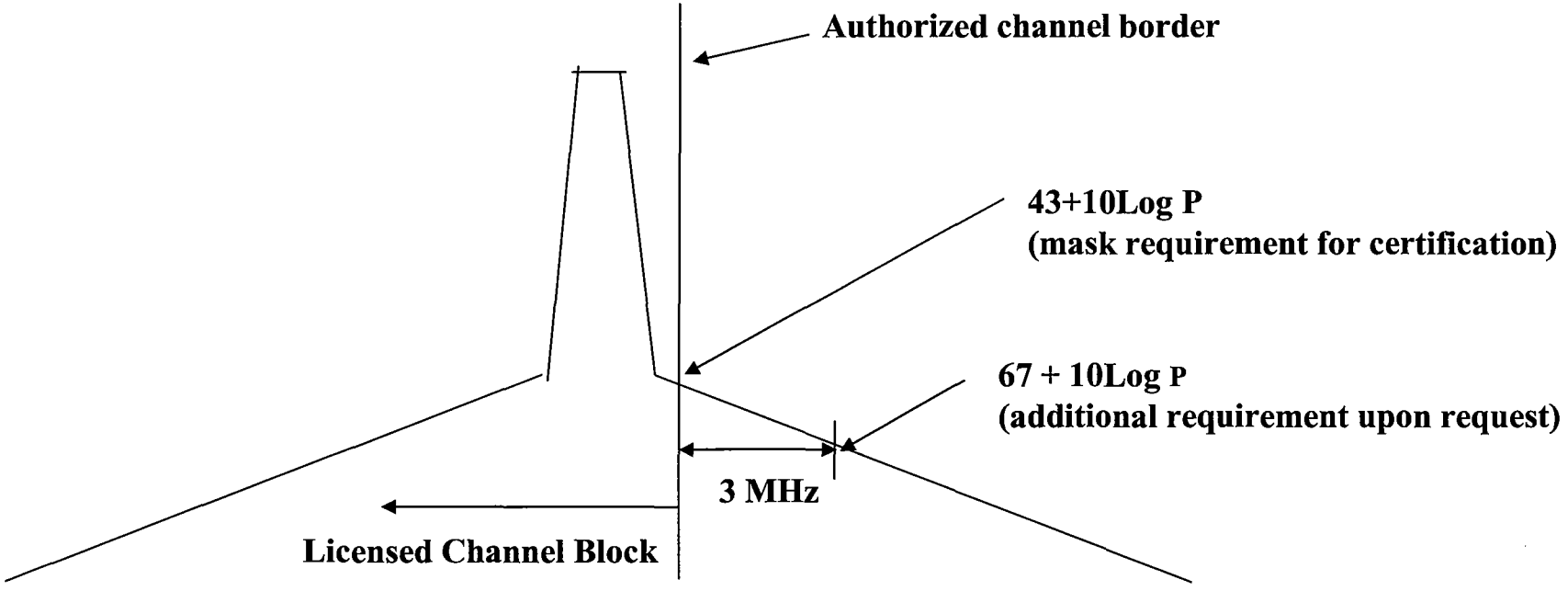
BS-to-BS Adjacent Channel Interference Protection Rules (per WCA Rebanding Proposal)

- OOBE Mask Requirement for base station
  - Standard mask requirement is 43+10log(P)
    - This is the mask to be used for MMDS base station as well as mobile station for FCC type approval
    - This is the same requirement as in the PCS band
  - If this is not enough, a neighboring channel licensee may request 67+10log(P) at 3 MHz away from the authorized channel edge if both base stations are separated by more than 1.5Km
  - Neighboring licensees may sign a private deal to override the tightened OOBE requirement
- Distance Based Requirement
  - If the distance between two base station is less than 1.5Km, the OOBE mask requirement becomes
    - 67+10log(P) - 20log(D/1.5), where D is the separation in km.
    - If co-located, the interferer transmitter must protect the noise floor of the victim receiver.
- These rules should be equally applicable to both TDD and FDD systems and the FCC's rules should clearly state that every system is obligated to protect its neighbors

BS-to-BS Co-Channel Interference Protection Rules (per WCA Rebanding Proposal)

- Signal Strength Limit at GSA Boundary
  - It's been proposed to be 47dBuV/m (or –98dBm/1MHz) measured at 1.5meter above the ground
    - This is the same limit applied in PCS band
- Safe Harbor
  - When two base stations with non-compatible technologies have a line-of-site, the receiving base station may experience severe interference even though the border signal strength requirement is satisfied
  - In this case, both base stations are required to operate under the Safe Harbor rules by satisfying the following requirements:
    - Height of transmission antenna (i.e. interferer) is equal to or less than $D^2/17$ (where D is the distance in Km between the base station and GSA boundary
    - Height of reception antenna (i.e. victim) is equal to or less than $D^2/17$ (where D is the distance in Km between the base station and GSA boundary
  - Again, neighbors may have a private agreement to override this requirement
  - These requirements will force both parties to negotiate and work out a solution

Base Station Emissions Mask (per WCA Rebanding Proposal)



Note that WCA requests identical measurement procedures as in PCS rules:

- 1MHz or greater resolution bandwidth
- However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

Distance based emissions mask requirement is not shown in the diagram.

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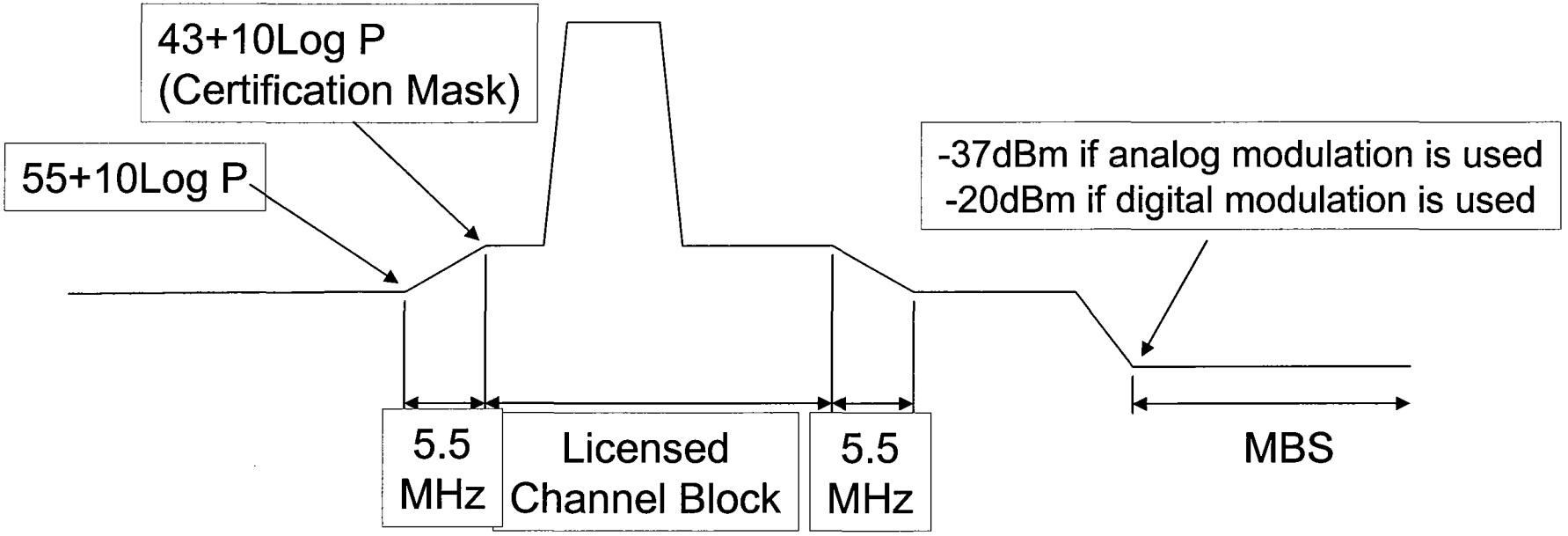
Mobile Station Emissions Mask (per WCA Rebanding Proposal)



Note that WCA requests identical measurement procedures as in PCS rules:

- 1MHz or greater resolution bandwidth
- However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

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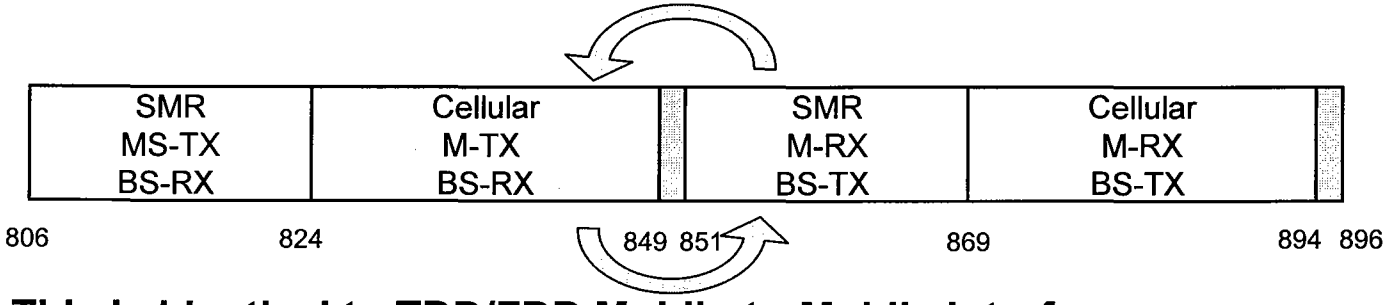
Interference Mechanism in 800MHz Bands

- TDD/FDD coexistence interference mechanism exists in the 800MHz band between SMR and Cellular bands with 2MHz of Air-to-Ground spectrum acting as guard band
- As an illustrative example, 800 MHz SMR base station transmitters may interfere with cellular base station receivers
  - All 800 MHz iDEN base stations have deployed a special duplexer filter to provide additional roll off of greater than 60dB within 2MHz of Air-to-Ground band to provide enough protection to cellular base stations
  - There have not been any major interference issues with this filter deployment.
- Cellular handset transmitters may interfere with 800 MHz iDEN handset receivers
  - Nextel is fully aware of potential interference between cellular mobile transmitters and SMR mobile receivers from the network benchmarking test vehicle experience where several different handsets (cellular, SMR and PCS) are placed adjacent to each other.
  - There are more than 50 million customers in cellular band and Nextel has over 13 million subscribers in the 800 MHz SMR band. However, Nextel believes there has not been any customer impacting interference case.

This is identical to TDD/FDD Base-to-Base Interference case



This is identical to TDD/FDD Mobile-to-Mobile Interference case

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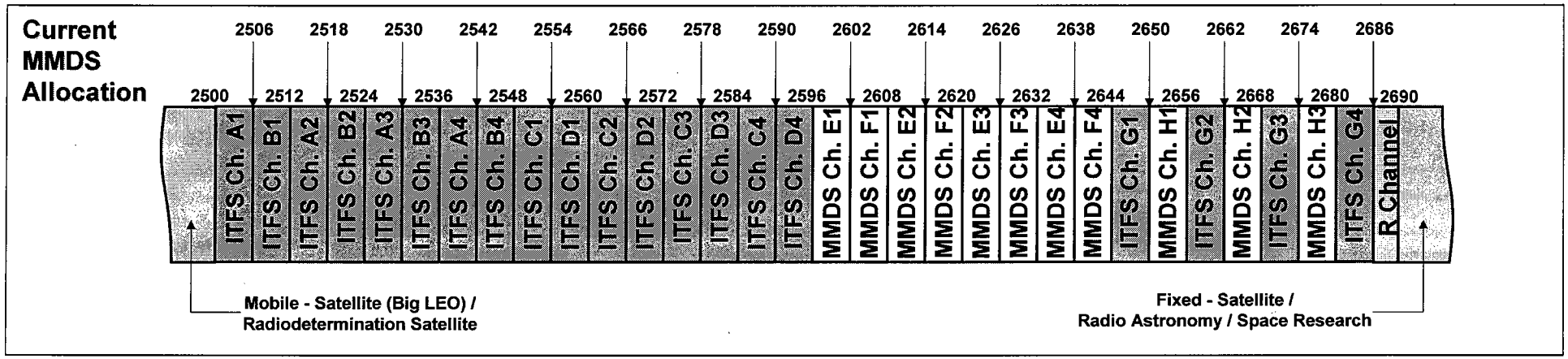
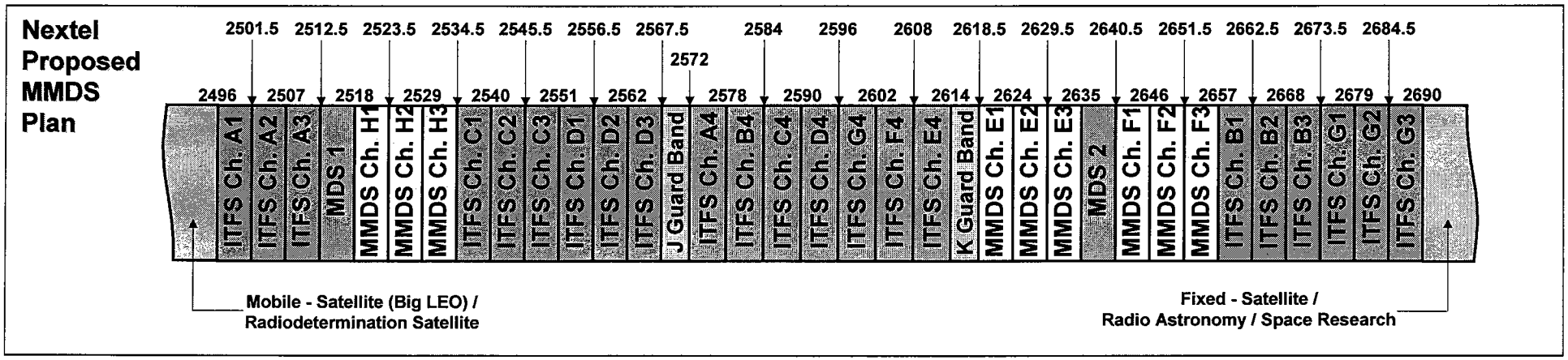
Concerns on Overly Tight Emissions Mask for Mobile Stations

- Nextel understands that the Commission is considering 67+10Log P as the emissions mask requirement for MMDS mobile stations at the channel edge where it borders with the MSS Big Leo Satellite band
- Nextel opposes such an overly tight emissions mask requirement for mobile stations because:
  - It's been proven that cellular handsets with 43+10log P emissions mask are not causing any customer impacting interference to SMR handsets due to probabilistic nature of mobile-to-mobile interference
  - It's not practical to implement this mask in small, light-weight handheld devices. Such a filtering requirement will substantially increase the size, weight, battery consumption and cost of handheld devices thereby compromising customer acceptance and competitiveness of services using this spectrum.

– Nextel submits that 43+10Log P as used in cellular and PCS bands will provide adequate protection to satellite handset receivers.

Current and Proposed Spectrum Allocation Plans for the MMDS Band