SIRIUS SATELLITE RADIO INC.
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XM RADIO INC.
1500 Eckington Place, NE
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July 9, 2008

WRITTEN EX PARTE
Ms. 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; Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band - IB Docket No. 95-91, GEN Docket No. 90-357, RM-8610

Dear Ms. Dortch:

On July 8, 2008, representatives from Sirius Satellite Radio Inc. ("Sirius") and XM Radio Inc. ("XM") met with the staff of the Office of Engineering and Technology ("OET") and the Wireless Telecommunications Bureau ("WTB") to discuss matters at issue in the above-captioned proceedings. Attending the meeting were James Blitz and Craig Wadin of XM, Terrence Smith and Alan Pate of Sirius, Robert Pettit, Carl Frank and Michael Lewis (engineering consultant) of Wiley Rein LLP, counsel for Sirius, and Peter Rohrbach of Hogan & Hartson LLP, counsel for XM. This group met with Julius Knapp and Ira Keltz from OET and Tom Derenge from WTB.

The points made by Sirius and XM during the course of the meeting are reflected in their earlier filings in the dockets. In particular, Sirius and XM discussed the attached presentation, which describes the technical and analytical data that the parties previously have submitted into the record.

Respectfully submitted,

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CC:
Julius Knapp
Ira Keltz
Tom Derenge

Presentation to FCC

July 8th 2008

Agenda

- Review of the record
  - The WCS Coalition's data is wrong.
    - Interference distances are large
- Consequences of proposed WCS Rule Changes
  - High probability of severe interference to satellite radio.
- Why mobile satellite service needs more adjacent band protection than terrestrial services
  - The available link margins are significantly different.
  - Very low noise subscriber receivers

The Record

- There is no substantive basis for the decade-old claim that Satellite radio repeaters will cause crippling interference to fixed or mobile WCS receivers.
- Sirius and XM have conclusively demonstrated that the WCS-Coalition's proposed Part 27 rule change has significant potential to cause severe interference to Satellite radio reception under real world use cases.
  - This finding is consistent with band allocations, analyses and experiments performed in other domestic and international regulatory reviews of similar terrestrial/ satellite TDD/FDD adjacent band situations.
- Both Sirius and XM technologies are well designed compromises between interference resistance, performance and cost.
  - Each generation of Sirius and XM Satellite receivers incorporate filtering and adjacent band interference mitigating technology equivalent to or better than receivers from other consumer services.
- The WCS Coalition's data and associated probability analysis has several fundamental flaws that render the subsequent conclusions invalid.
  - Noise Floor Analysis: The WCS Coalition apparently does not understand the basics of mobile satellite operation.
  - The WCS Coalition's probability analysis uses an unrealistic uniform distribution of users
  - Transmitter Power Control (TPC) is not a panacea.

Third Party Satellite Noise Floor Contributions

- FAU Affidavit
- Manufacturer confirmations
  - Laird
  - Matsui
- ITU Coordination

The WCS Coalition's Probability Analysis is Unrealistic

- The Analysis Incorrectly Assumes Uniform Spatial Distribution Of Users
  - Maximizes likely separation and minimizes interference potential.
  - In reality users of both services will be closely coupled in time and location on highways.
  - No direct connection of the number of users and satellite radios to anticipated or actual penetration rates. Unclear as to physical area covered.
- The Coalition's Analysis Is Very Technology Specific
  - Impossible to apply to rulemaking unless the FCC mandates the use of 802.16e technology, going against the idea of technology neutral allocations.
- The Analysis Is Based On Proprietary Algorithms And Code
  - Unclear how maximizing capacity (i.e. up-shifting in rate when channel is good) versus minimizing interference (reducing power at same rate) is balanced.
  - Oversimplifies power control operation; neglects the lack of correlation between mobile to base and mobile to satellite radio path loss values.
  - Omits WCS base station to satellite radio interference factor as where mobile powers down, base station is likely strong in a TDD system (correlated fading on up and downlink)
- The Path Loss Model Erroneously Assumes Lots Of Path Loss At Small Separations
  - Distorts distribution of satellite radio received powers
  - C, D block not considered.
- Even So, The WCS Coalition's Analysis Still Shows HIGH Probability Of Interference.
  - The Coalition's analysis shows 6% probability that their proposed OOBE rule would cause interference to satellite radio receivers and reduce satellite radio availability from 99.9% to 94%, an unacceptable result.
  - Probability of interference is further increased if the analysis considered the measured satellite radio noise floor.

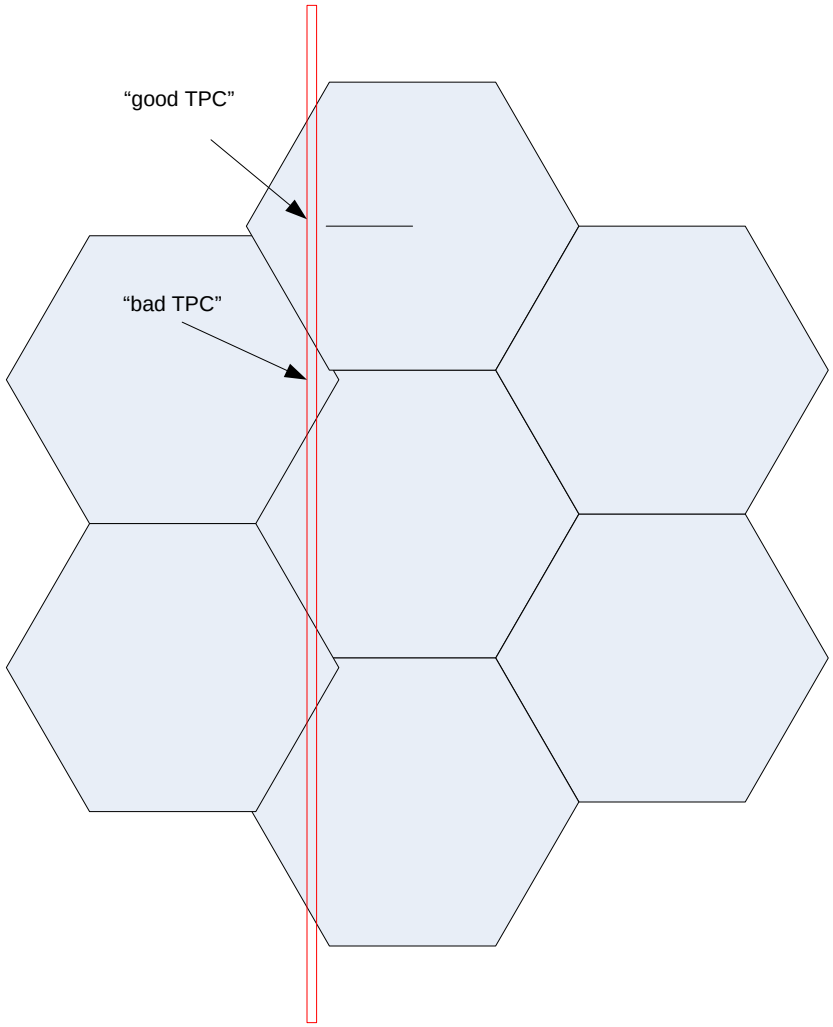
Real World Probability Analysis

- WCS/Satellite service interaction will primarily take place on highways with highly correlated time and spatial use cases.
  - Satellite radio listeners and mobile WCS customers will be heavily concentrated in vehicles for extended periods of time on the same highways
  - Same “busy hours”
- Satellite radio service’s penetration rate into vehicles is greater than 10% and increasing rapidly.
  - Customers listen continuously for hours during commutes and demand uninterrupted service
- Impact of interference will depend critically on service penetration rates, vehicular traffic characteristics, and relevant interference distances, not technology specific proprietary features.

Real World Impact

- On a typical commute on a major highway with 15% satellite radio and 4% WCS penetration rates and assuming an interference impact at 19m a simple analysis indicates that 20% of the satellite radio receivers on the highway would be impacted.

Transmit Power Control is No Panacea
TPC Depends on The User Distribution and Can Systematically Increase as Well as Reduce Interference



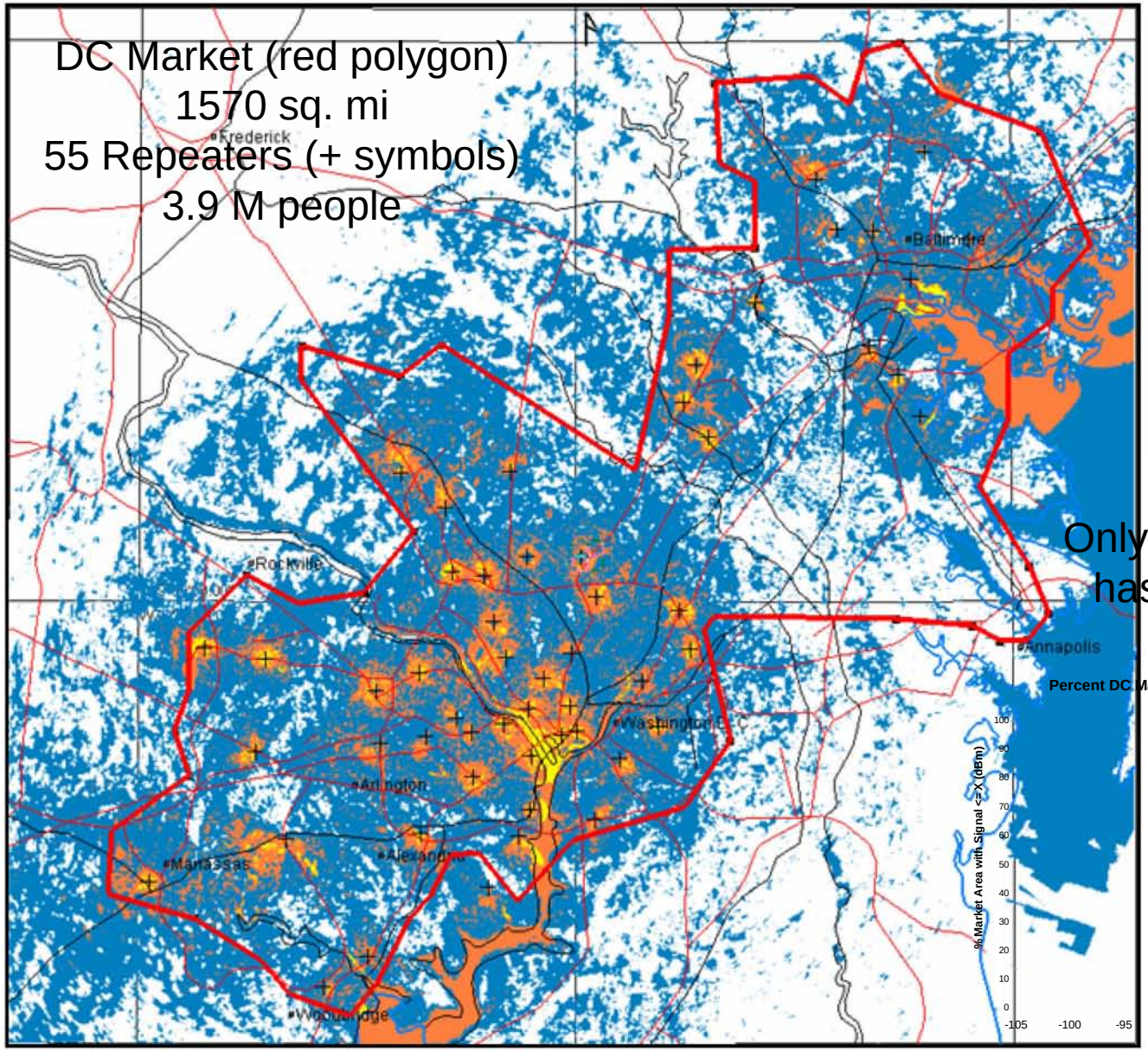
WCS and Satellite radio receivers interact on a roadway where the mobile power will ramp up and down depending on the interaction of the roadway geography with the cell grid and not the proximity of satellite radio receivers.

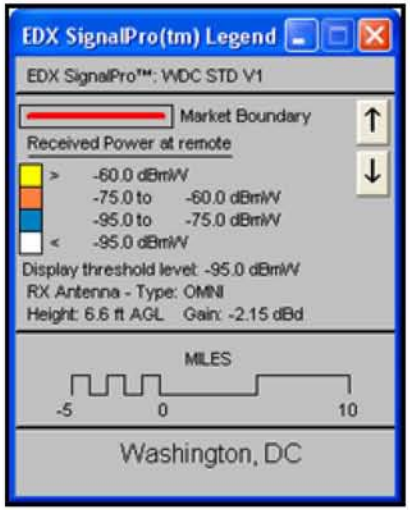
TPC will also ramp up power to compensate for shadowing, vehicle penetration and body losses, cancelling out any potential isolation effects these additional coupling losses might bring.

TPC will also compensate for other cell activity and WCS self interference by raising transmitter power

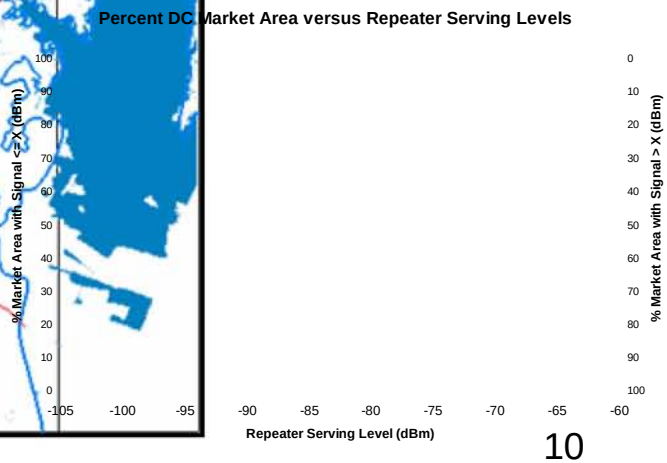
Satellite Radio Service is Predominantly Delivered by Satellites

WDC – Baltimore XMSR Repeater Coverage

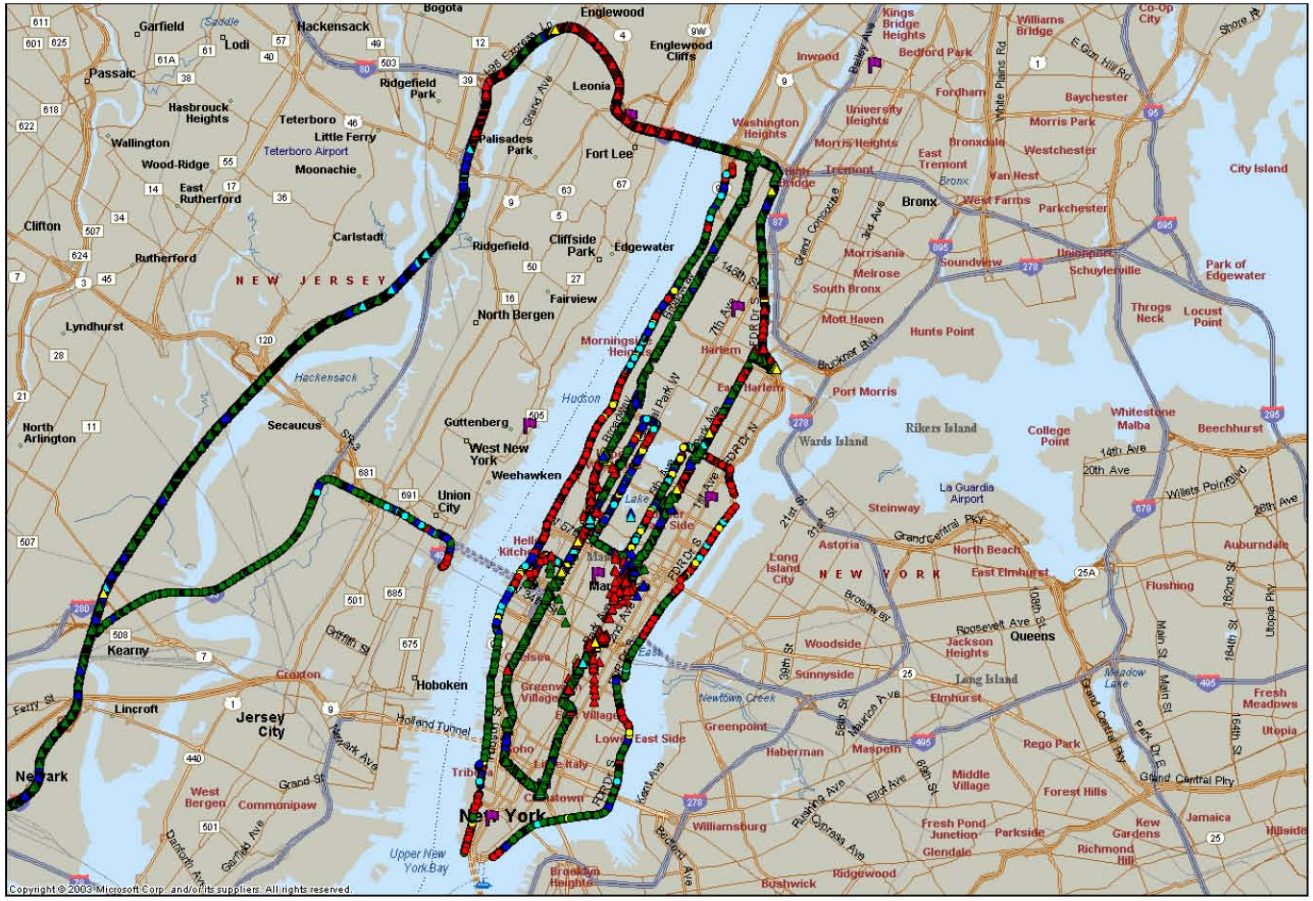




Only 1.6 % of DC Market has Signal > -60 dBm



Even in Manhattan Satellite Delivery Provides Significant Service Levels



Green areas denote satellite delivered service

Mobile Satellite Service Has Much Less Link Margin Than Terrestrial Service

- Mobile terrestrial uplink / Mobile satellite downlink adjacent band interference needs to be treated more conservatively than terrestrial/ terrestrial interference. Different impairment criteria are appropriate.

- Much less margin degradation by interference can be tolerated by Mobile Satellite signals.
  - Example- New Sirius FM5 Satellite ("Best case")
    - Link margin- determined by Satellite beam shape on a large scale
      - 10.7 to 18.7 dB (depending on location within Conus)
        - » Used for foliage, multi path fading, interference,
        - » Based on an "ambient temperature" thermal noise floor, the available margin is even less

  - Example- Mobile WCS- Wimax
    - Can be engineered and enhanced on a per cell basis
    - Depends on location within cell
      - Minimum of 24 dB
      - Can be up to 55 dB over significant areas within a cell (without raising WCS BTS power to 2 kW average or using 2 W mobiles)

Consequences of WCS Coalition's Proposed Rules

- Interference is highly likely
  - On major highways, large numbers of satellite radio customers will be severely interfered with for extended periods of time.
    - Even more massive loss of service during traffic congestion.
    - Does not include interference from pedestrian and nomadic use in small and medium towns.