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Telecommunications Law & Regulation

FEDERAL SPECTRUM DEVELOPMENTS

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CORF MEETING
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I. BROADBAND OVER POWERLINE

October 2011 (FCC 11-160)

BACKGROUND:

In 2006, FCC modified certain BPL technical rules. Among other things:

-FCC prohibited BPL operation on *73.0-74.6 MHz* within 65 *km* of the VLA

-BPL operators must consult with RAS prior to operation within 4 km of the VLBA sites, on frequencies from *1.7-80 MHz*.

On appeal, Court required FCC to review and re-justify certain technical criteria or change elements of the rules.

I. Broadband Over Powerline (cont'd)

In October 2011 Order, the FCC made changes to the BPL technical rules, particularly with regard to compliance measurement:

-increase in the required "notch" depth below 30 MHz from *20 dB to 25 dB*;

-for BPL devices operating below 30 MHz, a new procedure for determining *site-specific extrapolation factors* for measurements taken at a distance other than that specified in the rules; and

-a new definition for "*slant range distance*" used in taking compliance measurements.

II. TV BAND REALLOCATION AND "WHITE SPACES" DEVICES

A. TV SPECTRUM REALLOCATION ORDER

April 2012 (FCC 12-45)

- In November 2010, FCC proposed to add *new allocations for fixed and mobile* services in the TV Bands to be *co-primary* with the existing broadcasting allocation.

-Ch. 37 NOT proposed for re-allocation

- Proposed to permit two or more television stations to *share* a single six-megahertz channel, thereby fostering efficient use of the spectrum – Sought comment on *protection of RAS @ Ch. 37*.

-April 2012 Order does *not address these technical issues*. Future Order may address.

II. TV Band Reallocation and "White Spaces" Devices (cont'd)

B. SPECTRUM LEGISLATION, February 2012

Congress enacted legislation extending payroll tax deductions and unemployment benefits, and "paying" for these benefits by *authorizing spectrum auctions* in the broadcast television frequency bands.

-Section 6403(b)(4)(A)(iii): FCC shall reimburse the costs reasonably incurred by "*a channel 37 incumbent user, in order to relocate* to other suitable spectrum, provided that all such users can be relocated and that the total relocation costs of such users do not exceed $300,000,000."

Apparently directed at WMTS

II. TV Band Reallocation and "White Spaces" Devices (cont'd)

-*Requires* FCC to *reimburse*, but *does not require* FCC to forcibly *move* Ch. 37 incumbents

-But FCC probably has *discretion* to move incumbents, if it chooses and pays for relocation.

-In November 2010, FCC stated that Ch. 37 "is *not* part of the spectrum being considered for reallocation."

-But that *could* change. Is there *another TV channel* that could be as/more useful to RAS?

II. TV Band Reallocation and "White Spaces" Devices (cont'd)

C. WHITE SPACES DEVICES ORDER April 2012 (FCC 12-36)

BACKGROUND:

-Unlicensed TV bands devices, or "TVBDs," were previously authorized to operate on frequencies in the TV bands in areas where *band not used* by licensed TV stations ("TV white spaces").

-Fixed TVBDs may operate on any unoccupied channel between 2 and 51, *except channels 3, 4 and 37,* with power up to *4 Watts EIRP*.

-Personal portable TVBDs may operate on any channel between 21 and 51, *except channel 37*, with power up to *100 milliwatts EIRP,* except that operation on channels adjacent to protected channels will be limited to *40 milliwatts*.

II. TV Band Reallocation and "White Spaces" Devices (cont'd)

BACKGROUND:

Protection of RAS:

-prohibit TVBD use of channel 37

-prohibit operation of TVBDs within 2.4 km of:

- ATA
- Arecibo (including the islands of Puerto Rico, Desecheo, Mona, Vieques and Culebra),
- GBT
- VLA (19x22 mile protected zone)
- VLBA stations.

II. TV Band Reallocation and "White Spaces" Devices (cont'd)

April 2012 FCC Changes to Rules:

-*increased the maximum height* above average terrain (HAAT) for fixed device sites:
76 Meters to 250 meters (*plus* 30 m antenna height AGL)

-Established fixed adjacent channel emission limits and increased the maximum permissible power spectral density (PSD) for each category of TV bands device. A chart shows the new levels:

Type of TV bands device	Power limit (6 MHz)	PSD limit (100 kHz)	Adjacent channel limit (100 kHz)
Fixed	30 dBm (1 Watt)	12.6 dBm	-42.8 dBm
Personal/portable (adj. channel)	16 dBm (40 mW)	-1.4 dBm	-56.8 dBm
Sensing only	17 dBm (50 mW)	-0.4 dBm	-55.8 dBm
All other personal/portable	20 dBm (100 mW)	2.6 dBm	-52.8 dBm

III. 400 MHz Medical Radio Devices

November 2011 (FCC 11-176)

FCC expanded the Medical Device Radiocommunication (MedRadio) Service under Part 95 of the Commission's rules to permit the use of *new wideband medical implant devices.*

-413-419 MHz, 426-432 MHz, 438-444 MHz, and 451-457 MHz

-operation permitted on a secondary basis

-Maximum EIRP of any transmitter is limited to the *lesser* of

1 mW or (10 log B – 7.782) dBm

where B is the 20 dB emission bandwidth of the transmitted signal in MHz.

IV. TERRESTRIAL USE OF MSS SPECTRUM

Background:

-*3 MSS Bands*: the 2 GHz band ("S-band") from 2000-2020 MHz and 2180-2200 MHz, the Big LEO Band from 1610-1626.5 MHz and 2483.5-2500 MHz, and the L-band from 1525-1559 MHz and 1626.5-1660.5 MHz

-Bands largely *underused*, and in prime target spectrum, so FCC seeks to increase "*flexibility*" of usage.

-MSS currently allowed to operate an "ancillary terrestrial component" (ATC) repeater *integrated* with satellite use.

IV. TERRESTRIAL USE OF MSS SPECTRUM (CONT'D)

2011 ORDER:

1. *Add Terrestrial and Fixed Service Co-Primary Allocations in 2 GHz Band* (but not Big LEO or L-Band)

   -*NPRM* for service rules to follow
   -*Implied threat to MSS Operators?* Use it or lose it.

2. *Apply Leasing Rules to ATC for all MSS Bands*

   Still require satellite usage ("integration"), but FCC facilitates easier use by terrestrial partners

   Leasing generally requires notification to FCC, but not approval. More difficult to track.

IV. Terrestrial Use of MSS Spectrum (cont'd)

A. LightSquared ATC Waiver

Jan. 2011 FCC Order grants *waiver* of satellite service integration requirement, authorizing *terrestrial* service at 1525-1559 and 1625.50-1660.50 MHz

-Must *resolve GPS interference* concerns of NTIA and Industry before operation (GPS:1559-1610).

LS failed to do so, and this week filed for *bankruptcy*.

But like Iridium, LS *may emerge* from bankruptcy, if regulatory issues resolved.

IV. Terrestrial Use of MSS Spectrum (cont'd)

B. Globalstar L-Band

-Sept. 2011 FCC filing suggest that G-star *seeks* ATC authority in L-Band.

-FCC *continues to defer* L-Band ATC issue

-Any waiver request by G-star likely to receive extensive *scrutiny*, due to LS-GPS debacle.

V. DEVELOPMENTS AT 1.7 GHZ

BACKGROUND:

-FCC National B'Band Plan (and Presidential Order):

- 300 megahertz between *225 MHz and 3.7 GHz* should be made newly available for mobile BBand use within five years.

Add'l 200 megahertz w/in 10 years

-FCC/NTIA work together to identify spectrum

-NTIA Plan (Oct. 2010)*:*

-make 1695-1710 available (exclusion zones to protect NOAA downlinks)

-"Fast Track" review of *1675-95 and 1755-1780*

-Also review 1780-1850

V. DEVELOPMENTS AT 1.7 GHZ (CONT'D)

-*Industry* appears to *prefer 1755-80*:

-part of *int'l allocation* for commercial wireless

-adjacent to commercial AWS band at 1710-55

-*NTIA* appears to believe that 1695-1710 can be *cleared* more quickly

1755-1850 is heavily used by DOD, DHS, DOJ
March 2012 NTIA Report: 10 years and $10 B to clear band
(parties now looking at sharing)

V. DEVELOPMENTS AT 1.7 GHZ (CONT'D)

February 2012 Legislation:

Section 6401 requires the Govt. to "begin the process of withdrawing or modifying the assignment" of spectrum to federal government users in certain spectrum bands w/in 3 years.

Requires DOC report w/in one year identifying 15 MHz of spectrum between 1675 and 1710 MHz, for reallocation to commercial use.

-Currently allocated to the Meteorological Satellite Service use -- NOAA satellites, including POES and GOES

-NOAA/NASA use the 1675-1683 MHz band to operate radiosonde systems in the Meteorological Aids service.

Gold Rush at the New Frontier:

75 – 85 GHz

VI. Unlicensed Auto/Airport Radars at 76-77 GHz

May 2011 (FCC 11-79)

A. Auto Radars

FCC proposes changes to Part 15 rules for auto radars:

-FCC proposes to *consolidate* the in-motion, not-in-motion, front, side and rear-looking emission limits.

-Proposed *peak limit* of 55 dBm (279 μW/cm² at 3m) is *higher* than the existing FCC limits for radars on vehicles *not in motion*, but is *lower* than the current peak emission values for *in-motion* vehicular radars.

VI. Unlicensed Auto Radars at 76-77 GHz (cont'd)

- **Proposal vs. current rules:**

Average emission limit in dBm				Average emission limit in μW/cm^2 at 3m	
	FCC (current)	Toyota Proposed		FCC (current)	Toyota Proposed
Not-in-Motion	23.5	50		0.20	88
In-Motion Front	48.3			60	
In-Motion Side/Rear	45.3			30	

VI. Unlicensed Auto Radars at 76-77 GHz (cont'd)

Peak emission limits in dBm				Peak power density limits in μW/cm^2 at 3m	
	FCC (current)	Toyota Proposed		FCC (current)	Toyota Proposed
Not-in-Motion	43.5	55		20	279
In-Motion Front	68.3			6000	
In-Motion Side/Rear	65.3			3000	

VI. Unlicensed Airport Radars at 76-77 GHz (cont'd)

In same NPRM, FCC proposed:

-Unlicensed fixed airport radars to monitor terrestrial vehicles on runways.

-Issue raised re possible interference or not with auto radars in LOS of airport

VI. Unlicensed A/A Radars at 76-77 GHz (cont'd)

In August 2011 Comments, CORF:

-Did not oppose fixed unlicensed airport use

-Expressed concern re auto radars:

  -Interference to RAS *sidelobes*

  -difficulty and cost of *shielding*

-suggested waiting for results of NRAO/Bosch testing @ *79* GHz

VII. Airport FOD Radars at 78-81 GHz

December 2011 (FCC 11-185)

-FCC proposes Part 90 licensed fixed airport radars at 78-81 GHz to track “fixed object debris” (FOD) on runways.

-industry proposed RAS coordination through NSF, but FCC calls this “too burdensome,” and suggests coordination through NTIA (IRAC)

-Also seeks comments on Part 15 unlicensed use for FOD radars.

-require manufacturer database?

-New licensed approach -- possible conflict between auto/airport radar advocates?

VII. Airport FOD Radars at 78-81 GHz (cont'd)

In February 2012 Comments, CORF:

-did not oppose *fixed, licensed* FOD radars, subject to a *coordination* requirement (through NSF) w/in *90 km* of RAS.

-suggested that *if* FCC authorized unlicensed use, that *manufacturer database* is necessary to investigate interference events.

VIII. Level Probing Radars at 75-85 GHz

March 2012 (FCC 12-34)

-FCC proposes revised rules for *unlicensed* level probing radars (LPRs) at 5.925-7.250 GHz, 24.05-29.00 GHz, and 75-85 GHz.

-LPR devices measure the level (relative height) of various substances in man-made or natural containments (sand, coal piles, water basin).

-May be *open or inside tanks*.

VIII. Level Probing Radars at 75-85 GHz (cont'd)

BACKGROUND:

-Under Section 15.209 of the FCC's rules, any type of *unlicensed intentional radiator* may operate in *any* frequency band, *other than "restricted" bands* identified in Section 15.205(a) of FCC rules, as long as it complies with the *general* radiated emission limit.

-5.925-7.250 GHz and 24.05-29.00 GHz bands are *not* in restricted bands.

(75-85 GHz *is* restricted)

-LPR devices *already permitted* to operate in the lower two bands:

-average EIRP limit of -41.3 dBm.

-peak EIRP limit of -21.3 dBm.

VIII. Level Probing Radars at 75-85 GHz (cont'd)

Proposed emission limits, based on ETSI standards:

Frequency Band (GHz)	Average Emission Limit (EIRP in dBm/MHz) as measured boresight (Note 2)	Peak Emission Limit (EIRP in dBm measured in 50 MHz) as measured boresight (Note 2)	Equivalent Average Reflected Emissions if measured *in situ* (EIRP in dBm/MHz) (Note 3)
5.925-7.250	-33	+7	-55
24.05-29.00	-14	+26	-41.3
75-85	-3	+34	-41.3

Notes:
1. Minimum bandwidth at the -10 dB points is 50 megahertz.
2. All emission limits defined herein are based on boresight measurements (*i.e.*, measurements performed within the main beam of an LPR antenna).
3. Equivalent reflected emissions include antenna back-lobe and side-lobe emissions and worst-case reflections from material being measured.

VIII. Level Probing Radars at 75-85 GHz (cont'd)

FCC proposes to require that all *spurious/unwanted emissions* from LPRs not exceed the *general emission limits* in Section 15.209 when *measured in the main beam* of a device's transmit antenna;

-*measurement procedure* would also utilize *elevation and azimuth* measurement scans to determine the location at which these unwanted emissions are *maximized*.

Further FCC proposed protections:

-require the LPR be *professionally installed in a downward position*;

-limit installations of LPR devices to *fixed* locations; and

-*prohibit hand-held* applications of LPR and the marketing of LPR devices to *residential* consumers.

IX. SHOULD CORF BE MEETING WITH THE FCC?

-2 new FCC Commissioners

-Policy Goals?

-Action Plan:

-document goals and interests

-meet w FCC staff

-meet w FCC commissioners

QUESTIONS?

THANKS!

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