FLETCHER, HEALD & HILDRETH

FCC DEVELOPMENTS

MAY 2007– May 2008

CORF MEETING
MAY 20, 2008

Paul Feldman
feldman@fhhlaw.com
703-812-0403

I. Unlicensed Operations on Channel 37 (ET Docket 04-186)

In a May 2004 NPRM, the FCC proposed to allow limited use of unlicensed devices where TV channels are not being "used".

- Device would test for use by GPS location or sensing signals.

- CORF filed comments supporting prohibition of unlicensed use of 608-614 MHz

- In October 2006, the FCC took first tentative steps, issuing Order and Further Notice of Proposed Rulemaking:

I. Unlicensed Operations on Channel 37 (ET Docket 04-186) (Cont'd)

***Order*:**

- generally permits *fixed, unlicensed* operations after 2/17/2009 on "vacant" TV channels

- prohibits unlicensed use on Channel 37 and on Channels 52-69

- prohibits mobile devices on Channels 14-20 in all areas.

I. Unlicensed Operations on Channel 37 (ET Docket 04-186) (Cont'd)

Notice:

- sought comments on use of licensed devices on "unused" TV spectrum (apparently excluding Channel 37)

- sought comments on details of requirements for sensing use of spectrum, dynamic frequency selection, use of control signals, fixed operations on Channels 14-20, and OOBE (Part 15 standard or weaker?).

- Due to huge opposition from broadcasters, FCC moving slowly.

I. Unlicensed Operations on Channel 37 (ET Docket 04-186) (Cont'd)

- Channel 37 allocated to the Wireless Medical Telemetry Service as well as to RAS, so WMTS has been advocating protection of Channel 37. Recent filing by GE Healthcare proposes:
  - delayed or no operation on Channels 36 or 38,
  - alternatively -- only permitted on a fixed/licensed basis.

I. Unlicensed Operations on Channel 37 (ET Docket 04-186) (Cont'd)

- further alternative: emissions mask for unlicensed mobile wireless operations on Channels 36 and 38, designed to reduce spurious emissions into Channel 37.

- coalition of technology companies (including Dell, Google, H-P and Microsoft) have recently filed a letter supporting this emission mask.

- there appear to be calculation problems in the GE proposal.

II. Broadband Over Powerline (cont'd)

In October of 2006, an FCC Order modified certain Broadband-Over-Powerline ("BPL") technical rules. Among other things, the 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*.

II. Broadband Over Powerline (cont'd)

- Subsequent appeal of BPL rules to the D.C. Circuit by the Amateur Radio Relay League (ARRL):

Court sent parts of BPL rules back to the FCC, and required the FCC to make certain staff data available for public review and comment, and to review and re-justify certain technical criteria or change elements of the rules.

Challenged rules remain in effect in the meantime.

II. Broadband Over Powerline (cont'd)

Court was dissatisfied with two aspects of the FCC's decision-making process:

1. Five technical studies had been performed by the FCC itself, measuring specific BPL companies' emissions or emissions in certain geographic areas.

The FCC placed these in the public docket, but redacted some passages that it said were "preliminary or partial results or staff opinions" while claiming that they had not relied on the redacted material in concluding that BPL rules would prevent interference to other users of the spectrum.

II. Broadband Over Powerline (cont'd)

When Court reviewed the redacted portions, they concluded that they might contain evidence that could call the rules into question.

Court thus ruled that the FCC must publish the material and receive public comment on it.

II. Broadband Over Powerline (cont'd)

2. The FCC used from a pre-existing Part 15 rule an "extrapolation factor" of 40 dB/decade at frequencies below 30 MHz, in calculating the potential interference from BPL operations to other users.

The court held that the FCC had failed to explain why it appeared to disregard empirical studies in the record showing that 40 dB/decade was inappropriate, including British studies showing 20 dbB/decade was more appropriate.

On remand, the FCC must now either re-justify or change the extrapolation factor.

The next step in the process will be a request for new comments by the FCC. No date set yet.

III. 1.6 GHz Big LEO Spectrum Allocations

A. Modification of Uplink/Downlink Band Plan

- In November of 2007, FCC modified the 1610-1626.5 MHz band (the L-band) to provide "an equitable distribution" of the spectrum between the CDMA satellite system operated by Globalstar and the TDMA satellite system operated by Iridium.

- In place of prior spectrum sharing, CDMA and TDMA MSS systems each have the exclusive MSS use of 7.775 megahertz of L-band Big LEO spectrum.

III. 1.6 GHz Big LEO Spectrum Allocations (cont'd)

1994 Plan: the 1610-1621.35 MHz segment of the L-band designated for CDMA MSS uplink operations, and 1621.35-1626.5 MHz segment of the L-band for TDMA MSS uplink and downlink operations.

2004 Mod: in response to a request from Iridium, the Commission revised the band plan, and determined that TDMA MSS operators (Iridium) could use an additional 3.1 megahertz of spectrum at 1618.25-1621.35 MHz on a shared basis with Globalstar.

III. 1.6 GHz Big LEO Spectrum Allocations (cont'd)

2007: FCC reassigns 3.1 megahertz of shared Big LEO L-band spectrum to the exclusive use of Iridium, subject to minimal sharing requirements, and limits the amount of shared spectrum between Globalstar and Iridium to 0.95 megahertz of L-band spectrum at 1617.775-1618.725 MHz.

- FCC reminds Iridium that it is still bound by its coordination agreements with the NRAO and the NAIC, and that "it will have to terminate operations if its operations cause unacceptable interference to radio astronomy observations, as specified in the existing agreements."

III. 1.6 GHz Big LEO Spectrum Allocations (cont'd)

- FCC also acknowledges that some radio astronomy sites may not have existed, or may not have envisioned making measurements in the 1610.6-1613.8 MHz band, at the time NRAO/NAIC agreements were made, and suggests that operators of other sites can request a coordination agreement with Iridium.

CORF may want to alert appropriate RAS facilities of this invitation, and/or discuss the matter internally.

III. 1.6 GHz Big LEO Spectrum Allocations (cont'd)

B. *Modification of Band Plan for Terrestrial Use*

- in addition to use for uplink/downlink, L-Band allocated for Big LEO ancillary terrestrial component ("ATC") service.

- ATC allows MSS operators to operate a terrestrial service on the same frequencies as their satellite networks to overcome blocking by and in buildings etc.

III. 1.6 GHz Big LEO Spectrum Allocations (cont'd)

- in April of 2008, the FCC increased the spectrum available for ATC from 1610-1615.5 MHz to 1610-1617.775 MHz. This was driven by request from Globalstar for use by Globalstar.

- though Globalstar expresses interest in using ATC for WiMax, FCC notes that such use inconsistent with its authorization to use CDMA technology.

IV. Orbcomm Little LEO Authorization

- Orbcomm current operates constellation of 30 Little LEO satellites. Orbcomm is the only operational Little LEO

- Little LEO: non-voice, non-geostationary MSS using downlinks from 137-138 and 400.15-401 MHz, and uplinks at 148-150.05 MHz.

- In March of 2008, FCC granted authorization to Orbcomm to launch and operate 24 new satellites. 6 must be launched by March 2009, remainder by March 2014.

IV. Orbcomm Little LEO Authorization (Cont'd)

- Orbcomm states that satellites are or will be designed and constructed to limit out of band emissions, providing protection for RAS in adjacent bands, and subject to coordination agreement with NOAA.

IV. Orbcomm Little LEO Authorization (Cont'd)

- In addition to above frequencies, Orbcomm authorized to:

  Receive maritime "automatic identification system" signals at 161.9625 -- 161.9875 and 161.0125 – 162.0375 MHz

  Operate bi-directional 15 kHz Telemetry, Tracking, and Control links at 435.465 and 435.515 MHz center frequencies within line of sight of stations in Germany and Russia

  432-438 MHz Band allocated to EESS on secondary basis outside of US.

V. Ku-Band Developments

A. VME Rulemaking

- In May of 2007, FCC released NPRM on Ku-band Vehicle Mounted Earth Stations ("VMEs"):

  -Uplinks: 14.0-14.5 GHz

  -Downlinks: 10.95-11.2 GHz
  11.7-12.2 GHz
  11.45-11.7 GHz

- This is similar to previous FCC action on Earth Stations on Maritime Vehicles ("ESVs")

V. Ku-Band Developments (Cont'd)

- In VME Rulemaking, FCC noted use of the 14.47-14.50 GHz band by RAS, and sought comments on the feasibility of coordination between VME and RAS operations to preclude harmful interference to RAS:

  - VME operations in "vicinity" of US203 Observatories and of Arecibo, Mauna Kea, and St. Croix, coordinate with RAS as post-licensing condition, rather than a prerequisite to licensing.

V. Ku-Band Developments (Cont'd)

- CORF filed comments:
  - proposed ban on VME use of 14.47-14.50 GHz, noting difficulty of controlling location of VMEs, even with GPS.
  - alternative: coordination prior to licensing, especially if controls not embedded into terminals, in following coordination zones:

14.47-14.50 GHz
-45 km at St. Croix
-125 km at Mauna Kea
-90 km at Arecibo
-160 km for US203 observatories

V. Ku-Band Developments (Cont'd)

14.44-14-47 GHz
-2 or 3 km for VLBA
-10 km for remainder of US203

- CORF proposes changes to US203:
  - delete Five Colleges and Haystack
  - change Hat Creek to ATA and delete 14 GHz reference
  - add in VLBA
  - add in Univ. of Mich. and Pisgah
- No FCC action yet on Rulemaking.

V. Ku-Band Developments (Cont'd)

B. Raysat MET Authorization

- In February of 2008, FCC granted authorization to Raysat to operate up to 400 mobile earth terminals ("METs") mounted on vehicles. This is a grant in the Land Mobile Satellite Service using standard Ku-band uplinks and downlinks.

V. Ku-Band Developments (Cont'd)

- FCC notes that in contrast to VME proposal, Raysat does not seek to operate on primary basis in either 11.7-12.2 GHz or 14.0-14.5 GHz band.

  Raysat proposed using an existing secondary (to FSS) MSS allocation in the 14.0-14.5 GHz frequency band and as a non-conforming use in the FSS 11.7-12.2 GHz band.

  FCC grants Raysat's application under the Commission's existing rules.

V. Ku-Band Developments (Cont'd)

- FCC notes coordination agreement between Raysat and NSF under which Raysat will protect RAS operations at ten sites by means of exclusion zones for Raysat's METs:

  range from 160 km separation from the Green Bank and Socorro to 25 km separation from the VLBA at Hancock.

V. Ku-Band Developments (Cont'd)

- Coordinates of these exclusion zones will be programmed into Raysat METs, and that antenna transmissions within these zones will be terminated by means of a GPS system integrated into the antenna.

- FCC conditions authorization on Raysat's adherence to the terms of its coordination agreement with NSF.

V. Ku-Band Developments (Cont'd)

C. ViaSat AMSS Authorization

- In November of 2007, the FCC authorized ViaSat to operate up to 1,000 transmit/receive earth stations aboard commercial and private aircraft to connect with AMC-6 Satellite at 72° W.L.

- This is authorization in the Aeronautical Mobile Satellite Service ("AMSS") at:

  - 14.0-14.5 GHz (E-S)
  - 11.7-12.2 GHz (S-E)

V. Ku-Band Developments (Cont'd)

- Prior grants made to Boeing and ARINC

- While there are WRC and FCC allocations for 14 GHz uplink, and FCC issued 2005 NPRM for AMSS rules and downlink allocation, no current general rules for AMSS uplink and no downlink allocation

- In ViaSat Order, extensive discussion re concern about off-axis interference due to steerable and small diameter antenna.

V. Ku-Band Developments (Cont'd)

- FCC notes April 2006 Coordination Agreement between ViaSat and NSF, in which ViaSat agreed to meet specified limits on aggregate PFD in the 14.47-14.5 GHz band at various listed radio astronomy sites during periods of observation in that band. Compliance with Coordination Agreement is condition of ViaSat license.

VI. 4.9 GHz Fixed Microwave Links

- In May of 2007, FCC issued an NPRM which responded to petition to "clarify" the rules to state that licensees in the 4940-4990 MHz band have authority to operate point-to-point and point-to-multipoint permanent fixed links on a primary basis.

- Previously, FCC has authorized use of 4.9 GHz for mobile services, and authorized fixed use on a secondary basis.

VI. 4.9 GHz Fixed Microwave Links (Cont'd)

- CORF filed comments noting that the FCC's rules explicitly prohibit permanent fixed point-to-point stations in this band.

- Nevertheless, recognizing that the uses would be for public safety, CORF suggested that if the Commission revises its rules to allow permanent fixed operations in the 4.9 GHz band, such operations within the geographic areas denoted in Footnote US311 should go through prior frequency coordination.

- No further action by FCC at this time.

Questions?

Thanks!

Paul Feldman
feldman@fhhlaw.com
703-812-0403