

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: Status Update on FCC MBANS NPRM

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Abstract: Representatives of AFTRCC, Philips and GE met with FCC Office of Engineering and Technology on January 13, 2011 to present a joint proposal for MBANS service rules.

Purpose: To provide information on the current status of MBAN NPRM at the FCC.

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AFTRCC, Philips & GE Proposal for Secondary Use of Primary AMT Spectrum By MBANS

- Representatives of AFTRCC, Philips and GE met with FCC OET on January 13, 2011 to present a joint proposal for MBANS service rules.
- Entire presentation and proposed service rules can be found on FCC filed comment server, Docket #08-59 (<http://fjallfoss.fcc.gov/ecfs/document/view?id=7021025926>)
- This proposal is consistent with FCC's MBANS Notice of Proposed Rulemaking (NPRM) issued June 2009, Docket #08-59 (<http://fjallfoss.fcc.gov/ecfs/document/view?id=7020038311>)

Introduction

- AFTRCC, Philips and GE together have pioneered a unique approach to spectrum sharing that permits using the 2360–2390 MHz AMT primary spectrum by medical body area network service (“MBANS”) devices without fear of interference.
- Proposal achieves many of the health-related objectives of the Commission’s National Broadband Plan.
- Proposal centers on the use of proven propagation analytical software tools, coupled with MBANS automated device features to protect AMT in compliance with ITU-R Rec. M.1459 while maximizing access to AMT spectrum for indoor use at healthcare facilities.

Spectrum Proposal

- Healthcare facilities with no radio Line-of-Sight (“NLOS”) to an AMT ground station register with MBANS coordinator; AMT coordinator has access to database.
- If healthcare facility within radio Line-of-Sight (“LOS”) of AMT receiver, propagation analysis that considers geographic and building features will be employed to determine signal levels at AMT receiver; relevant features include blockage effects of local terrain and buildings, attenuation of healthcare facility windows and walls, etc.
- MBANS access to 2360-2390 MHz primary AMT spectrum permitted if signal at AMT receiver complies with Rec. M.1459 protection levels; operation managed by coordinator registration combined with electronic key/beacon system incorporated in MBANS system.
- Provision also made for time-limited access to unoccupied AMT channels on a coordinated basis for healthcare facilities that do not meet Rec. M.1459 protection levels.

Spectrum Proposal (cont.)

- Our unique approach uses an electronic key to ensure only authorized access to the 2360-2390 MHz spectrum.
- This proposal furthers the broadband and healthcare IT objectives outlined in the Commission's National Broadband Plan.
- Healthcare facilities required to file a predefined Transition Plan with the MBANS coordinator as a condition of coordination that manages re-channelization out of AMT spectrum if needed to accommodate primary AMT use.
- Our solution is consistent with the NPRM.
- While AFTRCC, Philips and GE support this proposal, AFTRCC approval is subject to federal users' review and approval.

MBANS Under Part 95

- AFTRCC, Philips and GE have prepared draft rules to propose to the Commission.
- Proposal designed to protect primary AMT users while providing sufficient stability for secondary MBANS users.
- Proposal is crafted as a new subpart to FCC Part 95 as proposed in ET Docket 08-59.
- License-by-rule approach for MBANS, similar to existing WMTS rules.
- MBANS devices would be subject to equipment certification under Part 2 of the FCC's rules.
- MBANS devices would operate in 2360-2390 MHz on a secondary basis with specific electronic control and coordination requirements.
- MBANS devices would also operate in 2390-2400 MHz on a secondary basis with somewhat higher power without need for specific electronic control or coordination.
- Proposal includes specific definitions to protect AMT and secondary medical users, as discussed below.

Definitions

- Maximum EIRP for MBANS devices in 2360-2390 MHz to be the lesser of 1 mW and $10 \cdot \log(B)$ dBm, where (B) is 20 dB emission bandwidth.
- Maximum EIRP for MBANS devices in 2390-2400 MHz to be the lesser of 20 mW and $16 + 10 \cdot \log(B)$ dBm, where (B) is 20 dB emission bandwidth.
- Emission bandwidth of MBANS devices limited to 5 MHz.
- MBANS devices must employ an unrestricted contention-based protocol that can avoid co-frequency interference whether or not the other signal(s) use the same protocol.
- MBANS devices using 2360-2390 MHz must employ electronic key/beacon mechanism to control operation.
- MBANS device must automatically cease transmissions in 2360-2390 MHz if device moves outdoors; this is accomplished by electronic beacon.

MBANS Coordination

- Healthcare facilities can access 2360-2390 MHz if NLOS with registration and semi-automatic electronic key delivery.
 - ~ 94% of hospitals in above category.
- Healthcare facilities can access 2360-2390 MHz if LOS, provided MBANS devices meet protection loss criteria, with registration and semi-automatic electronic key delivery.
 - Fewer than ~ 6% of hospitals in above category.
- Healthcare facilities also able to access unoccupied 2360-2390 MHz channels if LOS on coordinated basis with registration and automatic electronic key delivery.
 - Fewer than ~ 2% of hospitals in above category.
- MBANS devices can access 2390-2400 MHz without restrictions.

MBANS Protection

- AMT protection achieved with MBANS devices operating in radio NLOS to AMT receiver location.
- AMT protection achieved in LOS situations when protection criterion realized, as defined below.
 - AMT protection loss criterion is derived from ITU-R Rec. M.1459 to limit the maximum aggregate MBANS signal received from all MBANS devices by each AMT receive station in its main antenna beam.
 - Protection criterion is the total path loss to the AMT receive antenna and must be $149 + 10 \cdot \log(T/(1\text{mW/MHz}))$ dB or better, where T is the average transmission power spectrum density within the AMT bandwidth aggregated from all LOS MBANS operations at the location radiated in the direction of the AMT receive antenna in mW/MHz.

MBANS Transition Plan

- Roles and responsibilities of healthcare facility, vendor, and MBANS coordinator.
- Contacts for healthcare facility and vendor.
- Description of how MBANS systems will respond to re-channeling requirement.
- How to assess interference or interference potential.
- How to handle notification within 24 hours of interference complaint.
- How to handle new AMT sites within 7 days of notice.
- Plan execution timeline & verification.

Conclusion

- Proposal is designed to minimize interference impacts and address AMT concerns. It does not infringe on primary user rights or constrain primary user development, thereby protecting flexibility of mobile AMT users.
- Proposal would strengthen role of MBANS coordinator and rely upon unique electronic key and mandated transition plan to protect AMT primary uses.
- Proposal would ensure stability for health care facilities through well-engineered coordination and planning, thereby maximizing MBANS secondary access to AMT primary spectrum.
- Strong, rapid response facilitated by transition plan requirement in rare event of interference to AMT.
- Adoption of detailed proposal as submitted would enable the operations of both services in an effective manner.
- While AFTRCC, Philips and GE support this proposal, AFTRCC approval is subject to federal users' approval.

Conclusion (cont.)

- Proposal is consistent with the current NPRM, so a further NPRM not needed.
- AFTRCC, Philips and GE have developed a coordination approach to manage spectrum access that includes scientific analysis of the effects of terrain, building blockage and MBANS signal aggregation.
- We ask the Commission to adopt the proposed draft rules to maintain the structure of the parties' agreement.
- Two important industries have come together to better use the scarce radio spectrum to serve the public good.
- We look forward to working with the Commission constructively as our proposal is considered.