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Authors: A. Renshaw
E.Miller
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WRC-03 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item 1.20: to consider additional allocations on a worldwide basis for the non-GSO MSS with service links operating below 1 GHz, in accordance with Resolution 214 (Rev.WRC-2000)

ISSUE: Additional allocations at WRC-03 for non-GSO MSS (Little LEO) service uplinks below 1 GHz.

BACKGROUND:

Non-GSO MSS below 1 GHz systems have been implemented and additional systems are planned to initiate service before WRC-03. Spectrum needs have been identified in CPM 99 in the range of 17 MHz for service links, and 4 MHz for feeder links. ITU-R studies conducted at several frequencies below 1 GHz (148-149.9 MHz and 450-470 MHz) have shown that frequency sharing is technically feasible with terrestrial allocations under certain technical and operating constraints such as:

- limiting the duration of burst transmissions by the MSS,
- limiting the duty cycle of transmissions,
- time constraints before reuse of an uplink frequency,
- use of dynamic channel assignment techniques (as referenced in ITU-R Rec. M. 1039)

Currently operating non-GSO MSS systems below 1 GHz continue to demonstrate the practical feasibility of co-frequency sharing in the VHF band with fixed and mobile systems similar to those in other fixed and mobile bands below 1 GHz. Already completed ITU-R studies on MSS and terrestrial system frequency sharing have resulted in sharing models to be applied (Rec. M.1039), technical characteristics of MSS systems (Rec. M. 1184), technical characteristics of land mobile systems (PDNR 8A/[LMS.CHAR]), and sharing criteria for MSS and terrestrial systems. Sharing study results have been included in the CPM Reports to WRC-97 and WRC-00. Additional studies are planned for completion prior to WRC-03. Completed sharing studies since 1995 include:

a. A NGSO system operating in the 460 MHz band vs. a modeled land mobile analogue system (or digitally modulated, binary-FSK system) in which the worst case interference would reduce the land mobile availability less than 0.1 %, or from 99.0 to 98.9 %. The mean time between interference events for a land mobile user with 0.01 Erlangs of traffic was calculated to range from 10 hours to 21 months, which is much less than 0.1% decrease in channel availability.

b. Using a different non-GEO MSS network operating in a portion of the 450-470 MHz band, and constraints similar to those now used in the 148-149.9 MHz band, another study concluded that shared access to a minimum of 4 MHz of spectrum by five non-voice, non-GSO MSS can meet the modelled land mobile service (LMS) protection requirements.

c. A third study analyzed non-GSO interference to active remote pickup unit (RPU) channels linked to a sound broadcasting station in an urban noise environment (assumed to be -138 dBW). The remote

unit antenna height was 15 m and the base station receiving antenna height was 60 m. The simulation results showed that the probability of interference was 0.00015% (due to one interfering non-GSO MSS system). This is equivalent to a single short, one-half second, interference event every four days, assuming that the RPU is operating continuously for that period.

d. Studies of sharing between an MS system and the mobile units and the base stations of two digital trunked land mobile systems which may be deployed in Region 1 and other countries, and in Region 2. Four different geographical regions were used in the studies, Europe, North America, South America, and Central America & Caribbean. For the range of parameters studied, the maximum probability of interference into a single terrestrial link was 0.0030% for the first system and 0.0027% for the second system. . The results may be viewed as 99% channel availability being reduced to 98.9970% for the highest probability of interference in the cases studied.

e. Other studies were performed on two kinds of land mobile wireless systems used by broadcasting utilities. One of these systems is used in one administration for monitoring of incoming signals 24 hours per day at base stations located at an altitude of up to 1 000 m. Additional interference due to MES transmissions in the presence of a waiting mode receiver may increase the number of times that the squelch is activated and decrease the lifetime of the squelch relay to some extent. Some MES transmissions may be too short to activate the squelch circuit.

At WRC-95 and WRC-97 limited regional and country footnote allocations to the non-GSO MSS were made in 454-456 MHz and 459-460 MHz. Although this was a useful first step, these bands must be converted to worldwide allocations for the non-GSO MSS to be viable for these global systems. Due to the shared nature of these uplink bands and the permissive sharing techniques employed by the non-GSO MSS systems, additional worldwide allocations are needed for service uplink bands. Additional bandwidth allocated to the MSS will insure that the non-GSO MSS systems will be able to find adequate channels, while maintaining a very low probability of interference to other systems sharing that spectrum.

PRELIMINARY VIEW: Additional worldwide allocations for shared non-GSO MSS uplink service use should be made at WRC-03. The U.S. believes that the NVNG MSS < 1 GHz systems have proved their ability to share effectively in the 148.0-149.9 MHz band, and that studies completed in the ITU-R Study Groups have further confirmed the ability of Little LEO systems to share service uplink channels with fixed and mobile systems in other frequency bands under similar conditions. The U.S. view on Agenda Item 1.20 includes:

- Additional allocations for service uplink channels are urgently needed to maintain the viability of multiple non-GSO MSS systems due to the sharing of uplink frequencies with other services. For this reason, uplink channels are more urgently needed at this time than downlink service channels.
- Numerous sharing studies have been done to support additional allocations. Studies on sharing with specific systems are planned for completion prior to WRC-03. (04/18/2001)