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WRC-2003 ADVISORY COMMITTEE

DRAFT PRELIMINARY VIEWS ON WRC-03

WRC-2003 Agenda Item: 1.31 - to consider the additional allocations to the mobile-satellite service in the 1 – 3 GHz band, in accordance with resolutions 226 (WRC-2000) and 227 (WRC-2000).

ISSUE (Res. 226 only): Will sharing between aeronautical mobile telemetry and the Mobile Satellite Service in the band 1518 – 1525 MHz adversely effect flight test operations?

BACKGROUND (Res. 226 only):

The 1518-1525 MHz band represents a portion of the band 1435-1525 MHz (known as the “L-band”). The sub-band 1492-1525 MHz is allocated in Region 2 for MSS. However, the United States has preserved allocation of the entire band 1435-1525 MHz for flight testing of manned aircraft. Portions of this band are also in use for flight test telemetry in other Regions of the world. Res. 226 calls for studies of the potential for sharing between the Mobile Satellite Service and aeronautical mobile telemetry (*i.e.*, flight testing).

Because the development of aircraft is increasingly a cooperative international effort, United States flight test operations may be affected adversely by possible future changes in the allocation and use of these bands in other Regions. Concerns include not only electromagnetic interference issues, but extend to the harmonization of flight test standards, spectrum, and equipment world-wide. Given the extraordinary expense of flight test programs, as well as the safety of life aspects of flight test, these are significant concerns.

The conclusions arrived at during the October 2000 meeting of Working Party 8D are summarized in the Chairman's report, Document 8D/61 Attachment 14. Of interest here are three key points contained in the Chairman's report. First, a consensus has emerged that co-frequency, co-coverage sharing between flight test and MSS is not practical. Second, there seem to be no differences in principle with the notion that flight test operations may routinely be permitted to cause radio interference to MSS operations. Third, the MSS community has suggested that the use of highly directed spot beams might allow operation of MSS systems in close proximity to flight test operations without causing the latter harmful interference.

As a result of recent studies of the MSS/flight test sharing situation, the following conclusions and concerns have emerged:

1. Co-frequency, co-coverage sharing between MSS and Aeronautical Flight Test Telemetry is typically not possible.
2. The definition of what constitutes Co-frequency, co-coverage sharing is described by the pfd limits defined in ITU-R Recommendation 1459.
3. Interference to MSS ground stations by flight test telemetry transmitters may occur, and prior coordination to mitigate this may not be possible.
4. Relaxation of the pfd limits specified in Res. 1459 to enable sharing is not possible without seriously compromising the flight test capabilities of the ground ranges in question.
5. Interference from and coordination with other interferers may be a factor during coordination discussions between flight test operators and MSS providers.
6. The validity of the $-138 \text{ dBW/m}^2/4\text{kHz}$ pfd level used in earlier studies needs to be reaffirmed in light of other data that suggest pfd levels 10 - 15 dB higher are more realistic.
7. The interpretation of idealized antenna ground footprints needs to be refined by the addition of satellite orbital data. Specifically, proposed orbital positions with respect to flight test sites, and maximum lifetime inclination angles of GSO MSS satellites need to be considered when analyzing these footprints.
8. The next generation multi-beam antennas proposed for use at L-band will exhibit effects that need to be better understood.
9. Careful regard must be given to sidelobe, intermodulation, and other relevant effects such as out-of-band emissions.

PRELIMINARY VIEW (Res. 226 only): Based on previous and ongoing studies, co-frequency, co-coverage sharing between flight test and MSS is not practical. Second, flight test operations may routinely need to be permitted to cause radio interference to MSS operations. Finally, the performance of co-frequency, non-co-coverage MSS satellites operating at L band remains a topic of concern for flight test operations. Existing and proposed MSS spot beam antennas exhibit properties that suggest reallocation of the band 1518 –1525 MHz in Regions 1 and 3 can have an adverse impact on flight test operations in the United States. (17 April 2001)