PAKISTAN ELCTRONIC MEDIA REGULATORY AUTHORITY

Multi-channel multi-point distribution service (mmds)

Technical Standards

Application

1. These standards applies to all licensees or any authorized person who intends to operate a Multi-Channel Multi-Point Distribution Service (MMDS) occupying (2.500 -- 2.690) GHz in the radio frequency spectrum.

TECHNICAL REQUIREMENTS

2. The Maximum EIRP of a single station shall not exceed +24.2 dBW (264 W) in

any 1 MHz reference bandwidth for each forward channel (from hub station to subscriber station). For systems using analog modulation, the EIRP for a single station shall not exceed +32 dBW (1585 W) in any 6 MHz channel.

3. In the subscriber station to hub station direction the maximum EIRP of a

single station shall not exceed +8.3 dBW (6.7 W) in any 25 KHz bandwidth.

4. Subscriber stations shall be located within the authorized service area and must

use directional antennas for transmission and reception. However, for stations with an EIRP equal to or less than-6 dBW, the antenna may be omnidirectional.

Effective Height of Transmitting Antenna (EHAAT)

5. The height of a transmitting antenna above average terrain (HAAT) is the height of the radiation centre above the average level of the ground between distances of 3 and 16 Km from the transmitter in the direction of the receiver. For operations using omnidirectinal antennas, the terrain elevation along eight evenly spaced radials may be averaged, starting from the North, and the antenna height is then known as EHAAT.

Omnidirectional Antenna

6. An omnidirectional antenna is an antenna having a horizontal radiation pattern with variations of less than 4 dB (i.e. $\pm$2 dB) over 360 degrees.

7. The signal format shall be suitable for reception by standard PAL/SECAM/NTSCTV

Receivers after suitable down-conversion from the (2500 -- 2690) MHz band. (Signal scrambling is permitted).

8. Transmission Characteristics

8.1 Equivalent Isotropically Radiated Power (e.i.r.p.)

The maximum e.i.r.p. of the transmitter per 6 MHz channel is not to exceed 32 dBW in any direction. In general, the e.i.r.p. shall be adjusted so as not to cause the field strength, at the edge of the intended service area to exceed 66 dBu V/m (-80dBW/m^2).

8.2 Effective Antenna Height

The transmitting antenna should be limited to that height (HAAT for directional and EHAAT for omnidirectional operations) necessary to provide line-of-site to the required coverage area, which in normal cases should not exceed 50 Km radius.

8.3 Transmitter Spurious Emissions

The harmonics of the visual and aural transmitted carriers shall be attenuated at least 60 dB below level of the visual peak power output. All other emissions appearing on frequencies outside its channel bandwidth shall be attenuated at least 40 dB at the edges of the band falling linearly to 50 dB at frequency separation 0.5 MHz and 1.0 MHz beyond upper and lower band edges respectively and 50 dB thereafter, with the exception that inter-modulation products at $\pm$920 Khz and +2.66 MHz, with respect to the visual carrier shall be attenuated at least 46 dB.

8.4 Modulation

i. Visual - The modulation of the visual carrier shall be vestigial sideband AM (C3F) with the carrier nominally located 1.25 Mhz above the lower edge of the channel.

ii. Audio - The modulation of the aural carrier shall be FM (F3E) with the centre frequency located 4.5 MHz $\pm$ 1.0 KHz above the visual carrier frequency.

8.5 Frequency Stability and Tolerance

To enable the use of frequency offset in the channeling plan, the visual carrier frequency shall be maintained to $\pm$ 500 Hz of its assignment.

Location of Transmitter Site

9. The transmitter site shall be within the licence area of the related licence, unless otherwise stated in the technical specifications of the relevant LAP (Licence Area Plans).

Effective radiated power

10. Regardless of the location of the transmitter site, the ERP of a transmission shall not exceed that specified in the LAP.

11. If no LAP has yet been determined, the ERP of an existing transmission shall not exceed that specified in the technical conditions of the licence.

Maximum Antenna Height

12. If a licensee sites a transmitter at the nominal location described in the technical specifications of the LAP, the licensee shall ensure that the height above ground to the electrical centre of the transmitting antenna does not exceed the maximum height specified in the LAP.

13. If no LAP has yet been determined, the maximum height shall not exceed that specified in the technical conditions of the licence.

Interference to Other Services

14. A licensee shall not cause interference to another broadcasting service.

15. A licensee shall not cause interference to another radio communications service.