Antenna Statement

Mica Tech 0.52 Meter Antenna

FCC Rule §25.209

The 14 GHz antenna pattern contained with this application meets the antenna performance standards set forth in CFR §25.209 by 0.6 dB in the ±1.25° to 2.0° region . Further, the maximum RF power density normally licensed by the Federal Communications Commission for smaller diameter antennas, utilizing Ku-band digital traffic, is -14.0 dBW/4 kHz. This license application is being filed by Tri-State Generation and Transmission Association, Inc. to operate their remote antennas with an RF transmit power density of –28.0 dBW/4 kHz. When the Mica Tech 0.52 meter antenna pattern envelope is considered, the applied for transmit power density is 14.6 dB, lower than the maximum RF power density normally licensed by the FCC. This reduced RF transmit power will result in acceptable performance for the antenna, with respect to adjacent satellite interference.

The applicant agrees to accept any adjacent satellite interference in the 12 GHz receive band as a result of the performance of the antenna. The applicant understands that adjacent satellite interference protection applies only to the extent of the criteria set forth in §25.209.

FCC Rule §25.134(g)

Concerning FCC Rule 25.134(g), Tri-State Generation and Transmission Association, Inc. has filed for the use of 200 remote 0.52 meter earth stations. However, only 25 of these antennas will be transmitting at one time. If 25 antennas are each transmitting 0.4 watts, at any given moment, the total aggregate transmit power will be 10 watts. The formula below was used to calculate the RF transmit power density in dBW/4 kHz.

RF Transmit Power Density = 10Log (power in watts) or
= 10Log (0.4)
= -4.0 dBW/1 MHz -24.0
= -28.0 dBW/4 kHz

Utilizing the formula in Part §25.134(g) it can be determined that the maximum power spectral density for 25 remote antennas transmitting at once will be as follows:

Max Power Spectral Density = -14.0 -10Log(N)
= -14.0 -10Log(25)
= -14.0 -14.0
= -28.0 dBW/4 kHz

Since the RF transmit power density at 0.4 watts is -28.0 dBW/4 kHz and the Maximum Power Spectral Density is also -28.0 dBW/4 kHz, the 0.52 meter antennas should not cause problems if the number of transmitting antennas is limited to 25 at any given time.

Further, as noted on the preceding page, the antenna pattern for this antenna is actually 0.6 dB better than the antenna performance standards outlined in Rule §25.209. Therefore, if we again use the above formula and incorporate the fact that the antenna is 0.6 dB better than the guidelines, the below Maximum Power Spectral Density of -27.4 dBW/4 kHz would actually be higher than the -28.0 dBW/4 kHz as calculated by the formula for 25 antennas.

Max. Power Spectral density = -14.0 + 0.6 - 10 Log (N)
= -14.0 +0.6 – 10 Log(25)
= -14.0 +0.6 – 14.0
= -27.4 dBW/4 kHz