KUDD-FM1 Salt Lake City

Transmitter Power Output Calculations

This exhibit has been included to explain the basis for the transmitter power output utilized to achieve the authorized effective radiated power 0.22 kW. The antenna system consists of a cicularly polarized ERI SHPX-1AE Antenna. The antenna has a power gain of 0.4611 at 107.9 MHz. Therefore, an antenna input power of 477.12 watts is required to achieve 0.22 kW ERP.

To get the signal from the transmitter to the antenna, it must pass through 25 meters of Andrew HJ5-50 (7/8") transmission line (.35 dB loss) and a Nicom FBP800 bandpass filter (.6 dB loss). Total insertion losses encountered between the transmitter and antenna are 0.95 dB yielding an efficiency of 80.29%. Therefore, a power of 594 watts is required at the transmitter output to achieve the authorized effective radiated power.

TPO Calculations:

$$\frac{\text{Effective Radiated Power}}{(\text{Antenna Power Gain} * \text{Feed System Efficiency})} = \text{TPO}$$

$$\frac{0.22\ \text{kW}}{(0.4611 \quad * \quad 80.29\%)} = \textbf{0.594 kW TPO}$$