TRANSMITTER POWER OUTPUT

The transmitter power output of 4.8 kW specified in the instant application is based on the data and calculations that follow.

The transmission line is 122 meters of Andrew HJ7-50A semi-rigid air-dielectric coaxial cable. This transmission line has a loss of 0.64 dB per 100m at 91.3 MHz for a net loss of 0.781 dB for 122m. This equates to a transmission line efficiency of 83.5%.

WRTQ transmits with a directional antenna, Electronics Research Inc. (ERI) model P300-2AE/37M-1E-DA-SP. The authorized effective radiated power is 13.5 kW maximum in the vertical plane and 1.36 kW maximum in the horizontal plane. The directional antenna system yields peak directional power gain of 3.372 (5.279 dB) in the vertical plane and 0.341 (-4.678 dB) in the horizontal plane. Power is distributed to the vertical radiating elements and horizontal radiating elements via an asymmetrical power divider designed into the antenna feed system by the antenna manufacturer. The transmitter power output (TPO) specified yields the authorized effective radiated power in the vertical and horizontal radiation planes as shown below:

	Horizontal	Vertical
Transmitter Output Power (kW):	4.79	4.79
Transmission Line Efficiency:	× 0.835	× 0.835
Antenna Gain:	× 3.372	× 0.341
Effective Radiated Power (kW):	13.5	1.36

Rounding 4.79 kW value to the nearest 0.1 kilowatt increment as required per 47 CFR §73.212(a), the licensed transmitter output power shall be 4.8 kW to produce the authorized power in the vertical and horizontal polarization planes.

The WRTQ transmitter, a Broadcast Electronics model FMi 703, is certificated for operation at this power level.