

RF EXPOSURE STATEMENT

Wayside Transmitters

Pursuant to Section 15.247(a)(5), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. *See* § 1.1307(b)(1). Fixed stations operating under Section 15.247 of Part 15 of the FCC Rules are categorically excluded from making such studies or preparing an EA.

Individual installations of the equipment that will be operated as described in this application filing will use high gain (6 dBi or greater) antenna(s) permanently mounted on mast poles with a minimum height above ground of 4 to 5 meters in fixed location arrangements.

However, it is recognized that the Commission may have some concern and wish to have a showing of the separation distance needed to insure compliance. Maximum EIRP from any system configuration is less than 36 dBm. Using 36 dBm (4 watts) as the maximum power from the unit and calculating the separation distance required to meet the MPE limit specified in table 1 of Section 1.1310 of 1 mW/cm² for uncontrolled exposure yields the following results:

$$P_{\text{den}} = 4/\pi R^2 ; \text{ substituting: } 10^{-3} = 1.27 /R^2 ; \text{ calculating: } R^2 = 1.27/ 10^{-3} \text{ then } R = 36 \text{ cm.}$$

The duty cycle of the wayside transmitters is 70% according to the transmission protocol. Correcting the above by the duty cycle gives a separation distance requirement of 29 cm or 12 inches.

The antennas will be mounted on mast poles at the heights specified above insuring the general populace uncontrolled exposure requirement is always met as a result of the installation arrangement. The separation distance will always be more than 36 cm. Further, the beam pattern from the antennas and the mounting arrangement will direct the radiated energy in such a manner that it will have a low elevation angle which will provide additional protection for the general population.

During antenna maintenance operations, RF power systems must be turned off that feed power to the antennas. Performing the same calculation as above except substituting the MPE limit for occupational/controlled exposure, the separation distance required for compliance is 16 cm. Adjusting for duty cycle the separation distance becomes 13 cm in this case. In an abundance of caution however, the statement below will be added to the user/installation manual for the wayside transmitters. No training statement is needed for usage since maintenance requires power to be off.

"CAUTION: Before performing any maintenance on the antennas or other radio frequency components of this transmitter you are instructed to turn the RF transmitter off. In performing any system maintenance while the RF transmitter is in operation you must maintain a separation distance of 20 cm or greater."

In the above statement 20 cm is specified in lieu of calculated in order to insure that MPE conditions, limits, calculations and specifications would apply to these transmitters.