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WCPB-DT - Salisbury, Maryland

Figure 2-A

The following equation was extracted from OST Bulletin #65 and was used to determine radiation levels at ground level and at 2 meters above the ground for the specified antenna configurations:

$$S = \frac{(2.56)(1.64)(F^2)(ERP\,watts)(1000\,mW/watt)}{4\pi(R^2)}$$

where: S = power density (mW/cm^2)
F = relative field factor in downward direction
R = distance to the bottom of radiation (cm)

The maximum allowable radio frequency radiation at UHF frequencies between 300 and 1500 MHz is f/300 according to the radio frequency protection guidelines contained in the ANSI C95.1-1982 standard (American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 Ghz). The allowable radiation at television channel 56 is 2.4133 mw/cm^2.

The following variation of the above equation was used to determine the distance from the center of radiation of specified antenna configurations to the maximum allowable radiation level of 2.4133 mW/cm^2:

$$R = \sqrt{\frac{(2.56)(1.64)(ERP\,watts)(F^2)(1000\,mW/watt)}{4\pi(S)}}$$

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Figure 2-A (Cont'd)

2 meters above ground level

$$S_{2mAGL} = \frac{(.64)(1.64)(0.065^2)(130000)(1000mW/watt)}{\pi(14600cm)^2}$$

$$S_{2mAGL} = \mathbf{0.0009mW/cm^2}$$

For ground level

$$S_{Ground} = \frac{(0.64)(1.64)(0.065^2)(130000)(1000mW/watt)}{\pi(14800cm)^2}$$

$$S_{Ground} = \mathbf{0.0008mW/cm^2}$$

Calculations to determine the height on the tower (R) above which the ANSI maximum allowable radiation level of 2.4133 mW/cm² would be exceeded.

$$R = \sqrt{\frac{(0.64)(1.64)(0.065^2)(130000)(1000mW/watt)}{\pi(2.4133mW/cm^2)}}$$

$$R = 177.500cm = 1.77m$$

The distance from the lowest element to the point of maximum radiation would be 1.77 meters.