

Analysis of Non Ionizing RF Radiation

In accordance with the order of Docket 79-144, as adopted January 1, 1986, the following analysis of human exposure to non ionizing RF radiation has been performed. All calculations were made using the worst case formulas prescribed by OST Bulletin Number 65 and are based on a point 2 meters above the tower base.

I. Facilities

KCVN (FM)¹
104.7 MHz
100 kW H & V
277.8 m AGL

KRVN (FM)
93.1 MHz
100 kW H&V
248.7 m AGL

No other facilities are proposed nor are considered.

II. Calculations

KCVN

$$s = \frac{(0.64)(EIRP)}{\pi R^2}$$

$$s = \frac{(0.64)(1.64)(100,000 + 100,000)W(1000) \text{ mW/W}}{\pi ((275.8 \text{ m})(100\text{cm/m}))^2}$$

$$s = 0.0878 \text{ mW/cm}^2$$

$$\text{ANSI Max (C95.1-1992)} = 0.2 \text{ mW/cm}^2$$

$$\text{Percentage of ANSI Max} = 43.92\%$$

¹ The KCVN Form 340 was filed on May 17, 2005 and has the file number BPED-20050517AAI.

KRVN

$$s = \frac{(0.64)(\text{EIRP})}{\pi R^2}$$

$$s = \frac{(0.64)(1.64)(100,000 + 100,000)W(1000) \text{ mW/W}}{\pi ((246.7 \text{ m})(100\text{cm/m}))^2}$$

$$s = 0.1098 \text{ mW/cm}^2$$

$$\text{ANSI Max (C95.1-1992)} = 0.2 \text{ mW/cm}^2$$

$$\text{Percentage of ANSI Max} = 54.90\%$$

Site Total

KCVN 43.92%

KRVN 54.90%

Total 98.82%

III Conclusion

As the above calculations indicate, the worst case power density at the tower base falls below ANSI maximums for an uncontrolled environment. This effectively precludes inadvertent passive overexposure by members of the public. In reality, however, the actual level of non ionizing RF Radiation will be much less. KCVN proposes to employ an ERI Model SHPX-8 antenna and KRVN proposes to utilize an ERI Model SHPX-10 antenna. So as to determine the "real world" power densities at the tower base the Commission's FM Model software was used for calculations on both radio stations. The FM Model software determined that the power density attributable to KCVN reaches a maximum of 5.1236 $\mu\text{W/cm}^2$ which occurs at a distance of 74.5 meters. The KCVN contribution represents 2.56 % of the ANSI Maximum. Exhibit 3-1 is a power density plot showing the KCVN contribution. Similarly the KRVN power density was determined to be 5.6487 $\mu\text{W/cm}^2$ which occurs at a distance of 60.0 meters from the tower. The KRVN contribution represents 2.82 % of the ANSI maximum.

The KRVN power density plot is included in this report as Exhibit 3-2. Further precautions will be put in place as well. The site will be posted with signs warning of hazards due to High Voltage and RF Radiation so as to discourage trespassers from putting themselves at risk. Additionally plans will be developed so as to establish minimum safe distances at various power levels so as to protect agents and employees of the licensee from occupational overexposure. Tower maintenance will be performed only after sufficient power reductions are made so as to protect workers or, if possible, work will be scheduled at night when a complete cessation of the operation can be accomplished. Nebraska Rural Radio Association pledges to cooperate with all users of the tower to prevent occupational overexposure to excessive levels of RF Radiation.