

Engineering Report

Analysis of Non Ionizing RF Radiation KDHX (FM) proposed Auxiliary antenna – St. Louis, Missouri

This report is being prepared for Double Helix Corporation, licensee of KDHX (FM), St. Louis, MO, for the purpose of evaluating the proposed Auxiliary antenna KDHX (FM) transmission system for compliance with the non ionizing RF radiation limitations as set forth in OST Bulletin No.65 (OET-65). The proposed auxiliary KDHX (FM) antenna is co-located with the antenna for KEFN-CA.

Facilities included in the study

License: KDHX (FM) proposed AUX antenna
Facility ID number: 17380
Frequency: 88.1 MHz
ERP: 20.75 kW H&V
Center of Radiation: 120 m AGL

License: KEFN-CA
Facility ID number: 9375
Channel: 28 TV (analog – ZERO offset)
ERP: 50 kW H
Center of Radiation: 141 m AGL

RF radiation level – KDHX proposed AUX. antenna contribution

The KDHX (FM) maximum radiation level was determined by employing the Commission's FM Model software and that was determined to be $1.63 \mu\text{W}/\text{cm}^2$ which occurs at a distance of 111 meters from the tower base. A copy of the FM Model plot is included in this report as exhibit E1.

RF radiation level – KEFN-CA antenna contribution

KEFN-CA employs a CoEl model CO-4U/8 panel antenna. The antenna was installed with 2 degrees of mechanical beam tilt. The ERP is 50 kilowatts (10% aural), horizontally polarized. A vertical plane field intensity plot for that antenna is included as Exhibit E2. According to the data provided by the antenna manufacturer, the maximum relative field value in nearby downward directions (between 15 and 90 degrees below the horizontal) is less than 0.25 on Channel 28. The formula used for calculating NTSC signal density in the analysis is the same as formula (2) in supplement A of OET-65. A conservative value of 25 percent relative field is used for this calculation. The "general population/uncontrolled" limit specified in §1.1310 (CFR Title 47, Part 1) for Channel 28 is $371.3 \mu\text{W}/\text{cm}^2$.

$$s = \frac{33.4(f^2) [(0.4 \text{ Visual ERP}) + \text{Aural ERP}]}{R^2}$$

$$s = \frac{33.4(.25^2) [(0.4)(50,000) + 5000]}{139^2}$$

$$s = 2.70 \mu\text{W}/\text{cm}^2$$

Site Total

KDHX (FM) proposed Aux. antenna = $1.63 \mu\text{W}/\text{cm}^2 = 0.82\%$ of “general population/uncontrolled” limit.

KEFN-CA antenna = $2.70 \mu\text{W}/\text{cm}^2 = 0.73\%$ of “general population/uncontrolled” limit.

Site Total = $4.33 \mu\text{W}/\text{cm}^2 = 1.55\%$ of “general population/uncontrolled” limit.

Conclusion

As the above calculations indicate, the total power density at ground level falls well below the limits set forth in OST Bulletin 65. As such, there is no threat to the public of passive overexposure to dangerous levels of non ionizing RF radiation. Further precautions are in place. The tower is surrounded by a security fence, and the site is posted with warning signs of potential hazards due to RF Radiation. Double Helix Corporation will further work in cooperation with other users of the tower so as to assure that no tower workers will be exposed to excessive levels of RF radiation by reducing power and/or ceasing operation, as necessary, during periods of tower maintenance.

Certification

All information in this report and its associated exhibits are true and accurate to the best of my belief. I am employed by Double Helix Corporation as Chief Engineer of KDHX (FM) and I hold the Society of Broadcast Engineers certification of Certified Broadcast Radio Engineer. Having matters before the Commission, my qualifications are a matter of record.

Date: November 30, 2007

Signed: Ralph Brancato, CBRE