

December 2010
KNRK(FM) Channel 234C2
Camas, WA
NIER Analysis

Facilities Proposed

The proposed auxiliary antenna operation will be on Channel 234C2 (94.7 MHz) with an effective radiated power of 1.2 kilowatts. Operation is proposed with a 2-element circularly-polarized omni-directional half-wave-spaced antenna. The antenna will be side-mounted on an existing tower (the licensed site of KNRK) with FCC Antenna Structure Registration Number 1033770.

NIER Calculations

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . . For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation of the KNRK auxiliary will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\text{mW} / \text{cm}^2) = \frac{33.40981 \times \text{AdjERP}(\text{Watts})}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

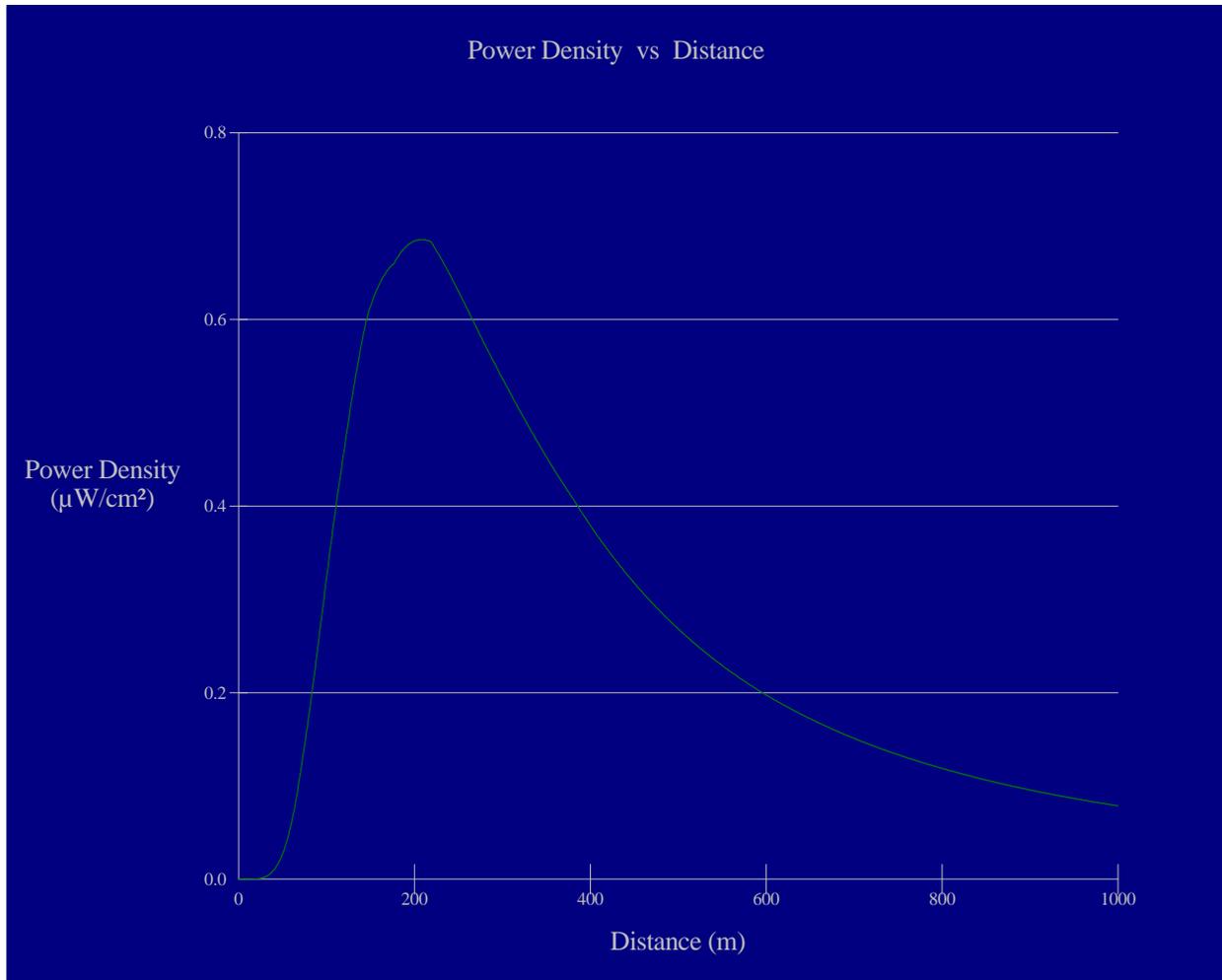
D is the distance in meters from the center of radiation to the calculation point.

Calculations of the power density produced by the KNRK auxiliary antenna system assume a Type 3 element pattern, which is the appropriate element pattern for the ERI MPX-2C-HW antenna to be used by the KNRK auxiliary. Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

The highest calculated ground level power density from the KNRK auxiliary occurs at a distance of 208 meters from the base of the antenna support structure. At this point the power density is calculated to be 0.7 $\mu\text{W}/\text{cm}^2$, which is 0.1% of 1000 $\mu\text{W}/\text{cm}^2$ (the FCC standard for controlled environments) and 0.4% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of the KNRK auxiliary alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 et seq and no further analysis of non-ionizing radiation at this site is required in this application.

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency radiation in excess of FCC guidelines.



Ground-Level NIER

OET FMModel

KNRK 234C2 Auxiliary Antenna

Antenna Type: ERI MPX-2C-HW "rototiller"

No. of Elements: 2

Element Spacing: 0.5 wavelength

Distance: 1000 meters

Horizontal ERP: 1.2 kW

Vertical ERP: 1.2 kW

Antenna Height: 104 meters AGL

Maximum Calculated Power Density is 0.7 : W/cm² at 208 meters from the antenna structure.