

**December 2014**  
**KNHK-FM Channel 283C1**  
**Newport, Washington**  
**Replacement of Directional Antenna**

**Background**

This Form 302-FM application is being filed pursuant to §73.1690(c)(2) of the Commission's Rules, to modify the license of KNHK-FM to reflect the replacement of the station's directional antenna, where the measured composite directional antenna pattern does not exceed the licensed composite directional pattern at any azimuth, where no change in ERP has resulted, and where compliance with the principal community coverage requirements of §73.315(a) are maintained by the measured directional pattern.

The prior Shively 6600-6R-DA antenna has been replaced with a PSIFM3HY-4-DA antenna with 0.84 wavelength spacing between the antenna bays.

Attached as exhibits to this application are:

- a) The manufacturer's directional antenna pattern measurement report
- b) A statement from the surveyor
- c) A statement for the engineer who supervised the antenna installation
- d) A contour map demonstrating compliance with the principal community coverage requirements of §73.315(a)

It should be noted that this facility is not authorized under §73.215 of the Commission's Rules, and therefore the 85% RMS requirement does not pertain.

**RF Exposure Calculations**

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.

Hatfield & Dawson Consulting Engineers

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

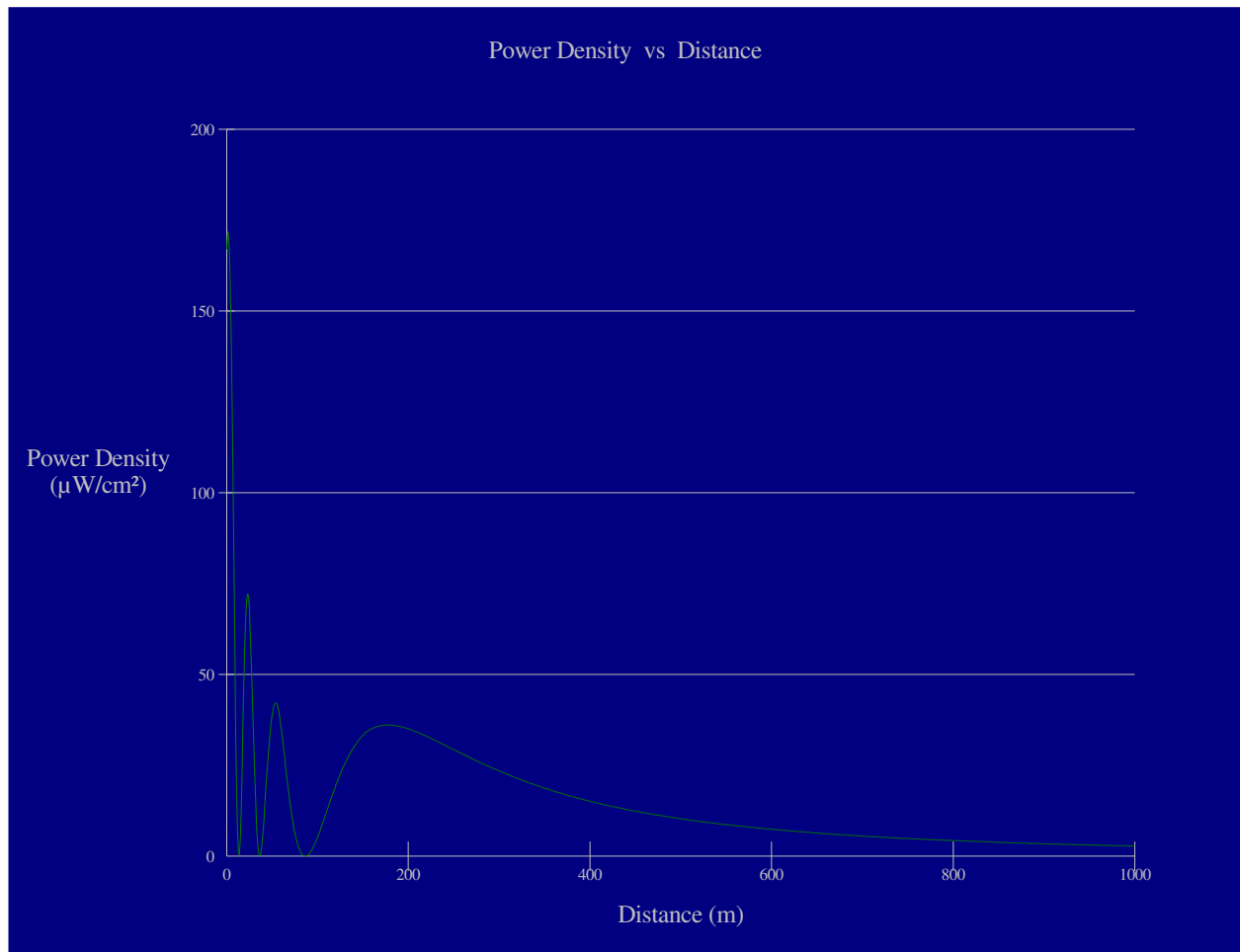
Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

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

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.

Calculations of the power density produced by the proposed antenna system assume a Type 1 element pattern, which is the “worst case” element pattern. Under this worst-case assumption, the highest calculated ground level power density occurs at a distance of 1 meter from the base of the antenna support structure. At this point the power density is calculated to be 171.8  $\mu W/cm^2$ , which is 86% of 200  $\mu W/cm^2$  (the FCC standard for uncontrolled environments).

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 exposure in excess of FCC guidelines.



### Ground-Level RF Exposure

OET FMModel

#### KNHK-FM 283C1 Newport

Antenna Type: PSI PSIFM3HY-4-DA (ring-stub element model used)

No. of Elements: 4

Element Spacing: 0.84 wavelength

Distance: 1000 meters

Horizontal ERP: 87 kW

Vertical ERP: zero kW

Antenna Height: 29 meters AGL

Maximum Calculated Power Density is  $171.8 \mu\text{W}/\text{cm}^2$  at 1 meter from the antenna structure.

Hatfield & Dawson Consulting Engineers