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 fieldstrength) at accessible locations.

As will be demonstrated below, the proposed operation of KYPT 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 the EPA report titled: *An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM, and TV Broadcast Services* (Gailey & Tell, April, 1985). All calculations contained herein are based on the measured element patterns for the antenna, and follow the procedure shown in the Gailey and Tell report. The patterns were identified by applying the procedure outlined in the report to the measurement data contained in the report titled: *Element Pattern Measurements on FM Antennas* (EPA-520/ 6-85-107, June 1985).

"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. Equation #1, contained in the Gailey & Tell report and shown below, was used to calculate the ground level power density figures from each FM antenna at incremental distances from the base of its supporting tower.

$$S(uW/cm^2) = \frac{(\text{Adjusted ERP in Watts}) \times 1.64 \times 2.56 \times 100}{4 \times Tt \times (\text{Distance})^2}$$

Where: Adjusted ERP in Watts is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

Distance = Distance in meters from the center of radiation to the calculation point.

Calculations of the power density produced by the KYPT antenna system assume a Type 9 element pattern, which is the appropriate element pattern for the 8-bay ERI type 1080 panel antenna to be used by KYPT. 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 KYPT occurs at a distance of 55 meters from the base of the antenna support structure. At this point the power density is calculated to be 3.2 uW/cm^2, 0.3% of 1000 uW/cm^2 (the FCC standard for controlled environments) and 1.6% of 200 uW/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 KYPT 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 transmitter site is remote, and public access is restricted by three locked gates on the rugged access road leading to the summit of Tiger Mountain. The antenna tower is posted with warning signs. Pursuant to OST Bulletin No.65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken.

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.

Power Density vs Distance
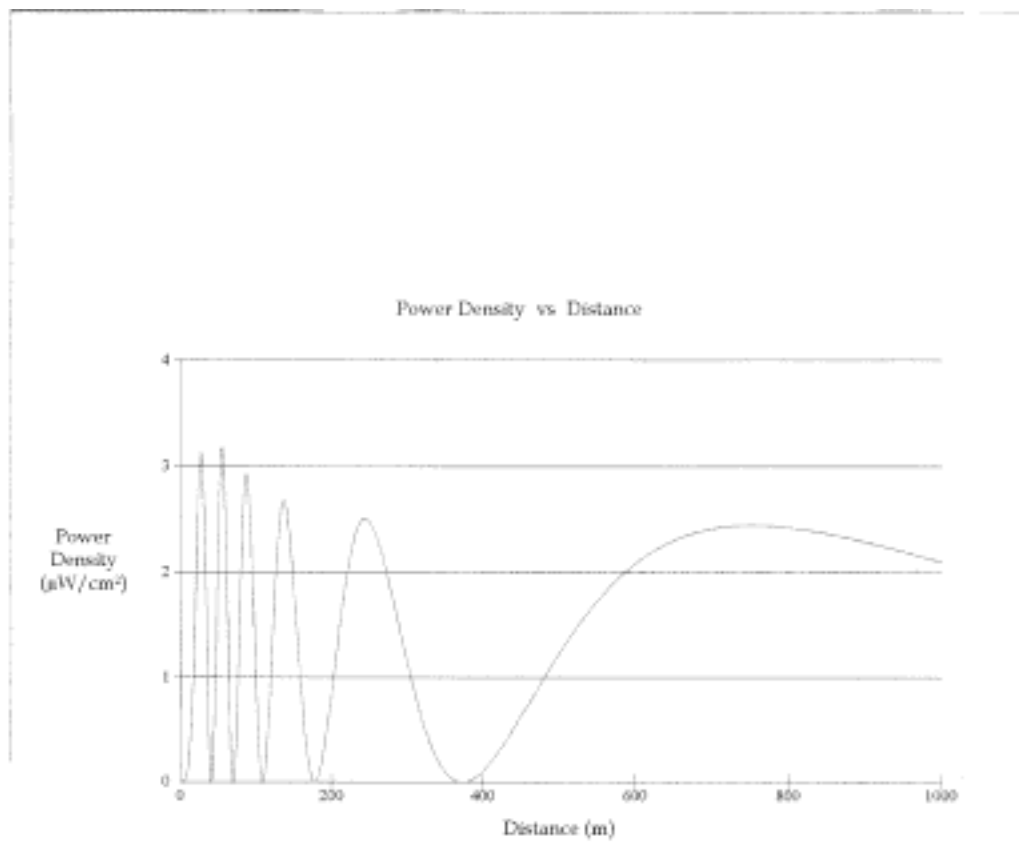
Ground-Level NIER Analysis   **OET FMModel**

KYPT(FM) Seattle
Antenna Type: ERI 1080 Panel
Number of Elements: 8
Element Spacing: 0.75 wavelength

Distance: 1000 meters
Horizontal ERP: 52 kW
Vertical ERP: 52 kW

Antenna Height: 65 meters AGL

Maximum Power Density is 3.2 μW/cm^2 at 55 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers