

Asheville, North Carolina
Minor Modification Application for FM Translator W300CR
On Channel 300
by
Western North Carolina Public Radio, Inc.

Exhibit 17
Nonionizing Radio Frequency Radiation Analysis

August 2016

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Declaration

I declare, under penalty of perjury, that I am a technical consultant to broadcasting and other communications systems, that I have over twenty-five years of experience in the engineering of broadcast and other communications systems, that I am familiar with the Federal Communications Commission's Rules found in the Code of Federal Regulations Title 47, that I am a Professional Engineer registered in North Carolina, that I have prepared or supervised the preparation of the attached Exhibit 17, Nonionizing Radio Frequency Radiation Analysis, for Western North Carolina Public Radio, Inc., and that all of the facts therein, except for facts of which the Federal Communications Commission may take official notice, are true to the best of my knowledge and belief.



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22 August 2016

Narrative

This Exhibit supports a minor modification application for a new FM translator, W300CR, file number BNPFT-20130830AMF, Asheville, North Carolina. The application proposes fill-in service for co-owned FM station WCQS, Asheville, North Carolina. The modification involves an increase in height above the roof of 2 meters, horizontal location of no more than 10 meters, and a change of antenna make, model, and directional pattern.

This Exhibit shows that the proposed operation is in compliance with nonionizing radiation regulations.

Radio Frequency Radiation Evaluation

The proposed W300CR facilities are 7 meters above the roof of an existing building. There is an existing LPFM stations WRES-LP, Asheville, North Carolina, on the same building, but horizontally separated from the proposed translator antenna. There are also a number of cellular, PCS, and AWS services on the building. Access to the roof is locked. There are signs warning of RFR hazard on the roof, directing workers to remain at a distance from any antennas, and providing telephone contact numbers for the carriers.

The proposed W300CR facilities, when evaluated under worst case methods in OET-65¹, will create 0.67 mW/cm² two meters above roof level. The antenna, a SWR FMEC/1-TA, provides a reduction in downward radiation. In addition, the antenna mounting location is above the stair tower roof with the major lobe of the antenna oriented away from the main

¹Cleveland, Robert F., Jr., Sylvar, David M., and Ulcek, Jerry L., *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*, OET Bulletin 65, Edition 97-01.

portion of the roof. Most of the accessible area of the roof will receive a significantly reduced power density due to the horizontal plane pattern of the antenna.

The manufacturer's vertical elevation pattern is shown as Figure 1. The horizontal plane pattern is shown as Figure 3. The power density at 2 meters above roof level, using the formula in OET-65, is shown as Figure 3, assuming omnidirectional operation, plotted to a distance of 60 meters. Figure 4 is the power density as computed by the computer program FM Model² using the EPA Type 2: Opposed V Dipole antenna type, which matches the SWR FMEC antenna. Figures 3 and 4 use milliwatts per square centimeter and microwatts per square centimeter, respectively, resulting in a shifting of the decimal points. FM Model uses corrections at short distances from the bottom bay, which in this case is the only bay.

Figure 5 shows the layout of the main roof, with the broadcast facilities identified. Figure 6 is an elevation view, showing the relationships among the broadcast facilities.

There is a small area on the roof of the stair tower where the predicted power density exceeds the uncontrolled/public exposure limit. Roof access is already restricted, with signs explaining the nature of the hazard. Western North Carolina Public Radio, Inc. will install additional signage on the roof, marking below the antenna with additional signs.

² <https://www.fcc.gov/general/fm-model>, as developed by the FCC based on data published by the EPA in 1985.

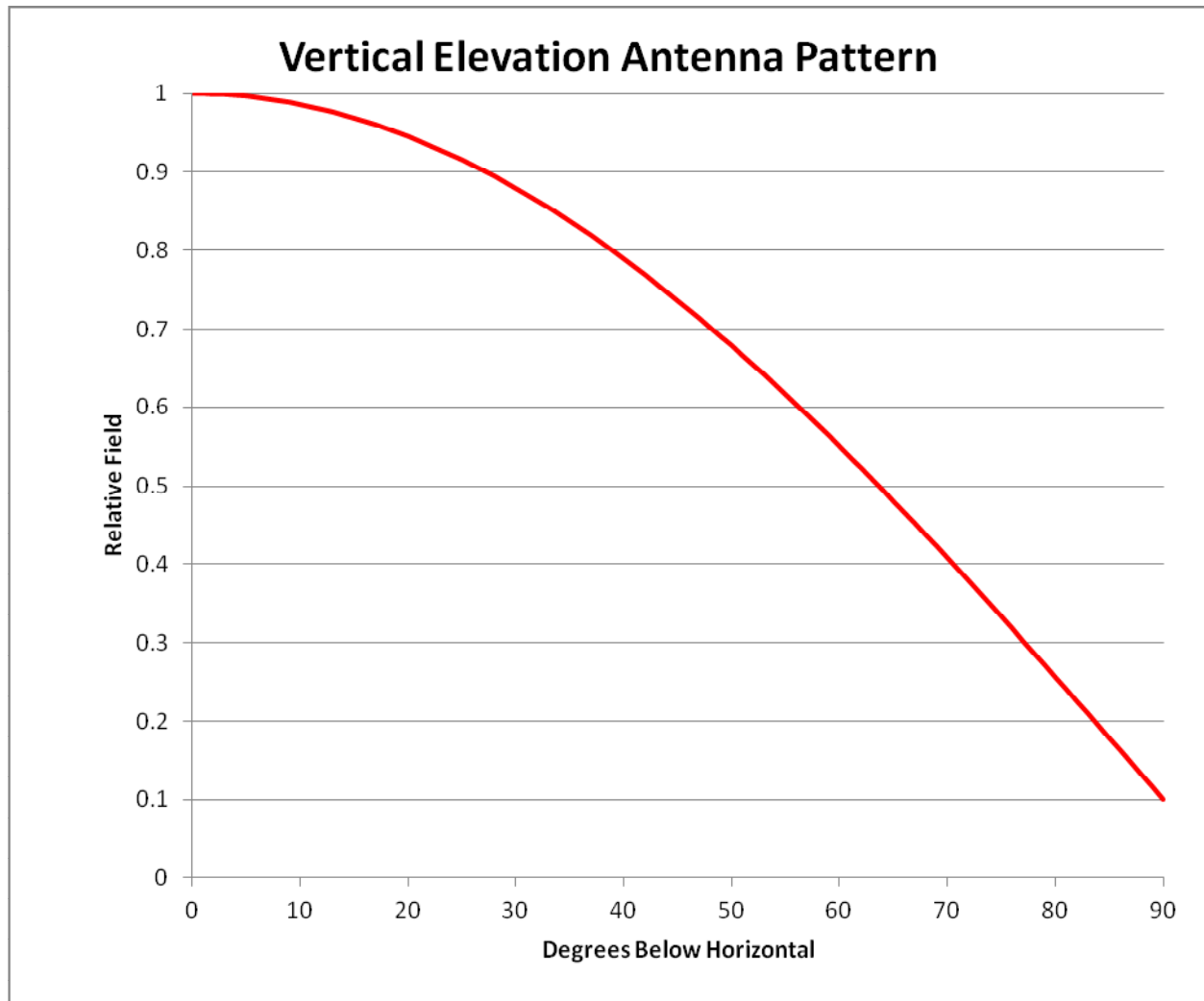
Figure 1: Antenna Vertical Pattern

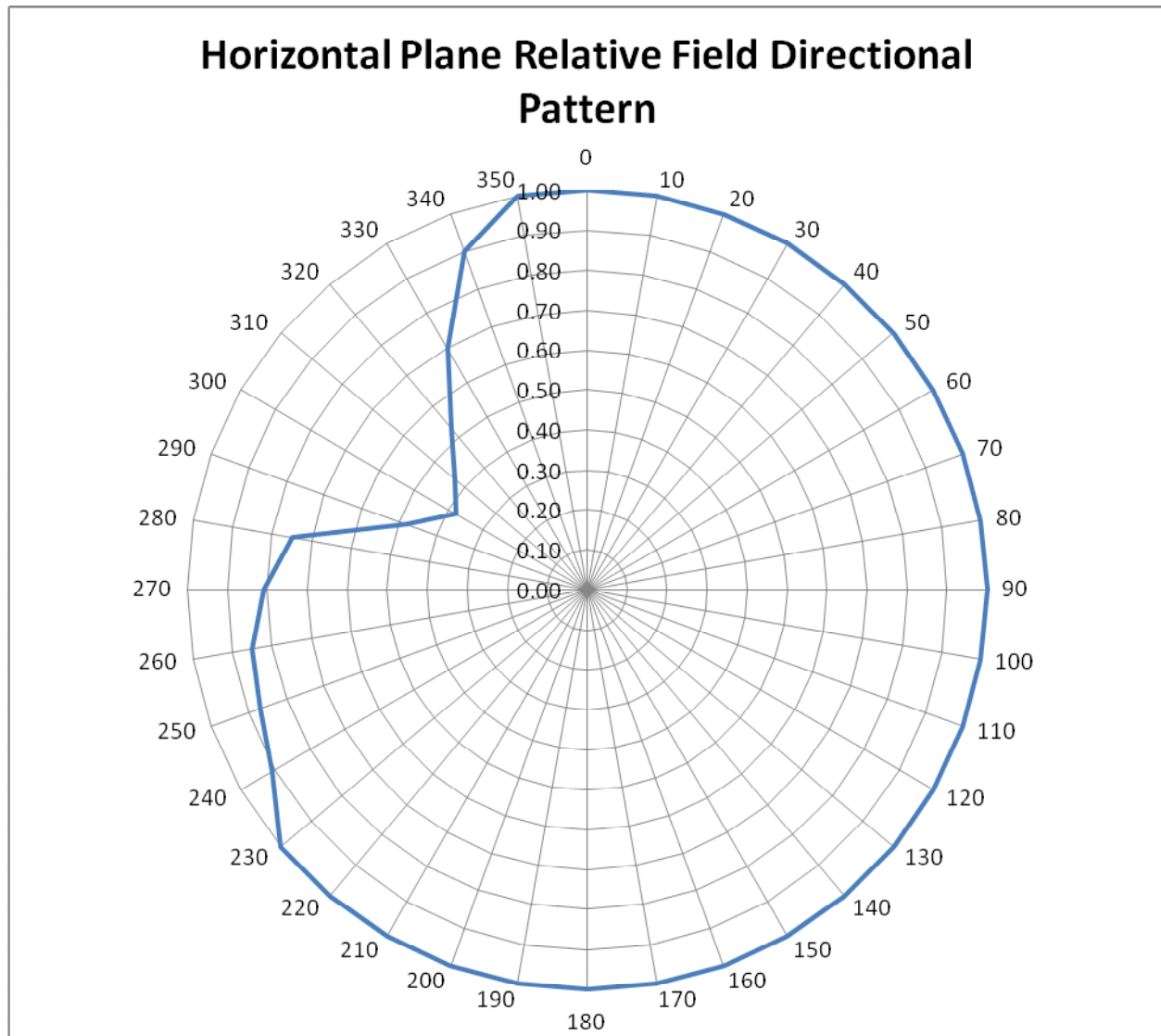
Figure 2: Horizontal Plane Antenna Pattern

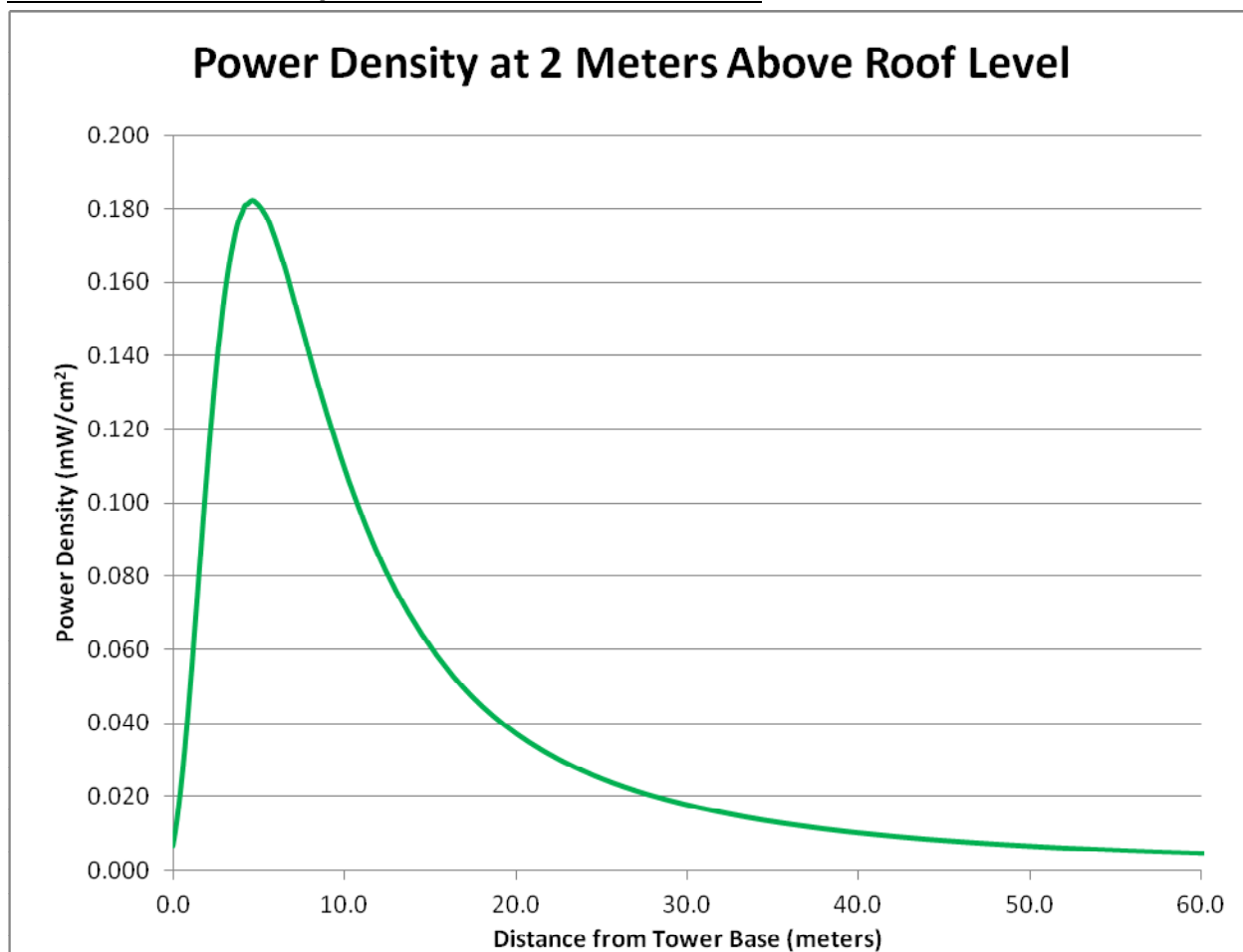
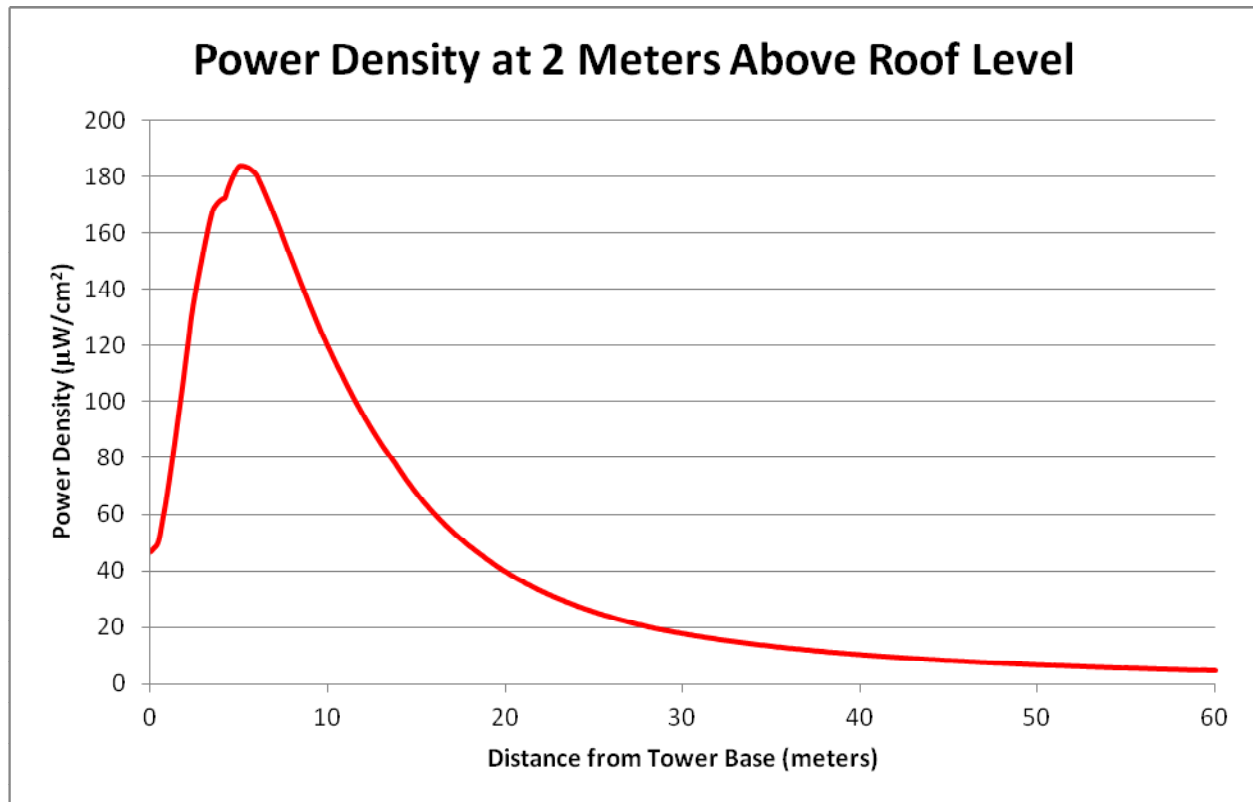
Figure 3: Power Density at 2 Meters Above Roof Level

Figure 4: FM Model Power Density at 2 Meters Above Roof Level

Western North Carolina Public Radio, Inc.

Roof Layout

8/22/2016

Figure 5

