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RADIOFREQUENCY RADIATION EXPOSURE ANALYSIS
AMENDMENT TO STATION E860019 MODIFICATION APPLICATION
WBAL HEARST TELEVISION INC.
BALTIMORE, MARYLAND

WBAL Hearst Television Inc. (hereafter, Hearst) is the licensee of Station E860019 in the Fixed Satellite Service (FSS). The station operates in the Ku band and is used in the temporary fixed mode for satellite news gathering purposes. Hearst has an application pending which seeks to modify the station's license by installing a replacement transmitter with a rated power output of 70 watts in place of the present 300 watt transmitter. No other change is proposed. The purpose of the instant amendment to the pending application is to provide responses to Form 312, Schedule B, Items E38 and E40 and to correct the emission designator response in Item E50.

The reduction in transmitter power results in a reduction in effective radiated power, and a reduction in all radiofrequency radiation (rfr) power density levels. It follows that if the existing operation complies with FCC radiation exposure criteria, so will the proposed operation. However, since the original rfr analysis study could not be located, and in the interest of providing updated information that addresses the specifics of the proposed operation, a new analysis is provided.

The analysis of prospective radiofrequency radiation exposure has been performed following the methodology set forth in OET Bulletin 65, Edition 97-01, for aperture antennas. The informational data employed in the analysis were supplied to the undersigned by Hearst and the analysis results that were obtained are set forth in the succeeding paragraphs. As explained, where regions of excessive rfr exposure are predicted, operational procedures are employed that are designed to avert overexposure.

The antenna is a Vertex, Model 2.4DMK. The antenna has a 2.4 meter diameter, D, and is roof-mounted on a truck such that the center of the antenna to the truck's rooftop is 2.13 meters. The center of the antenna above ground is 5.18 meters. The antenna satisfies FCC envelope radiation characteristic requirements for the Ku band

(14.0-14.5 GHz). The mid-band (14.25 GHz) power gain for the antenna is 49.5 dBi. The wavelength, λ, at 14.25 GHz is 0.0211 meter. The approximate antenna area, A, = $\pi(2.4 \text{ m}/2)^2 = 4.524 \text{ m}^2$.

The transmitter output power is 70 watts (18.5 dBW). After taking into account the waveguide loss of 1.97 dB, the maximum average antenna input power, P, is 45 watts (16.53 dBW). The calculated antenna aperture efficiency, η, is 0.7 based on equation 14 in the referenced OET Bulletin 65.

Per OET Bulletin 65, equation 11, the antenna surface maximum power density, $S_{surface} = 4P/A = 4 \times 45 \text{ W}/ 4.524 \text{ m}^2 = 39.8 \text{ W/m}^2$, or 3.98 mW/cm^2 .
The distance to the near field limit, R_{nf} , is $D^2/4\lambda = 68.2$ meters .The maximum near field power density, $S_{nf} = 16\eta P / \pi D^2 = 27.7 \text{ W/ m}^2$, or 2.77 mW/cm^2 .

For the transition region, the distance to the region limit (beginning of far-field) is given by equation 16. $R_{ff} = 0.6 D^2 / \lambda = 0.6 \times (2.4 \text{ meters})^2 / 0.0211 \text{ meters} = 163.8 \text{ meters}$. The on-axis power density, S_t , is given by $(S_{nf} \times R_{nf}) / R_{ff}$. The value turns out to be 11.5 W/m^2 , or, 1.15 mW/ cm^2 .

The FCC's adopted maximum permissible exposure (MPE) for uncontrolled locations is 1.0 mW/ cm^2 at 14.25 GHz. Then, using 1.0 mW/cm^2 for S_{ff} in equation 18, it is possible to determine the on-axis distance, R, for compliance with the MPE. For the proposed operation, the distance is 178.6 meters

The foregoing results indicate that excessive exposure levels could be encountered on-axis to a distance of 178.6 meters. Operating personnel and members of the public in the near field of the main reflector of the antenna could experience over

exposure, too. Hence, to avoid possible overexposures to workers, and the general public, excitation to the antenna never occurs when anyone is located atop the truck roof, and then, not until the antenna has a clear path toward the satellite with which it is communicating. Also, excitation to the antenna is terminated whenever maintenance, or other activities require someone to be on top of the truck's roof. Because the antenna is mounted atop the truck, and cannot be aimed less than 5° above the horizontal plane, there is no possibility that accidental exposure to persons at ground level can occur.

Since the antenna meets the radiation characteristics set forth in the Rules, the off-axis radiation level at a distance greater than one diameter below the antenna rim is no more than 1 % of the on-axis level. Because of the height of the antenna above ground, no person at ground level can be overexposed. Appropriate radiation hazard warning signs are posted on the truck. Based on the foregoing, the proposed operation is deemed to be in compliance with FCC's adopted guidelines regarding rfr exposure.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 8, 2010.

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