

Northern Minnesota Public Television, Inc.
DTV Construction Permit Minor Modification
FCC Form 340 - Exhibit 36
Non-ionizing Radiation Compliance

The proposed facilities will fully comply with the current FCC Standard with regard to human exposure to non-ionizing radiation. The proposed KAWE-DT facilities will be added to an existing tower structure that is utilized for the KAWE Channel 9 NTSC antenna, which is a Harris TAB-12 omni-directional batwing antenna top mounted on the existing tower structure that has an overall height of 329.1 meters AGL.

Equation (2), found on Page 30 of Supplement A to OET Bulletin 65, details the calculation technique used to determine the power density at the base of a TV broadcast tower. In this case, however, it is necessary to substitute the proposed average DTV effective radiated power (80 kilowatts) for the expression $[0.4ERP + ERP]$ in this equation to compensate for the fact that DTV power levels are expressed in terms of average power, rather than peak power, as is the case for the visual portion of an analog TV signal.

To be conservative, these calculations are based on a relative field factor in the downward direction of 0.2 for both the KAWE-DT and the KAWE NTSC antennas. Please note that this value of 0.2 is much more conservative than the actual value of about 0.1 for both the DTV and NTSC antennas. (See Ch-18 DTV antenna details in Exhibit 33 for vertical pattern).

For KAWE-DT Channel 18, this equation yields a predicted maximum power density at two meters AGL of $0.0516 \mu\text{W}/\text{cm}$. Performing the calculations for KAWE's analog Channel 9 signal, the power density at 2 meters AGL is $0.0856 \mu\text{W}/\text{cm}$. Adding these two figures together, we get $0.1372 \mu\text{W}/\text{cm}$ combined power density at 2 meters AGL.

Since the maximum permitted power density for uncontrolled exposure on TV Channel 18 is $300 \mu\text{W}/\text{cm}$. and on Channel 9, it is $200 \mu\text{W}/\text{cm}$., as a worse case scenario, we will use the $200 \mu\text{W}/\text{cm}$ as the maximum figure for our investigation.

Based on this, the total combined power density of $0.1372 \mu\text{W}/\text{cm}$. at 2 meters AGL amounts to only 0.086 % of the maximum permitted level for uncontrolled exposure. Since this is considerably less than 5% of the permitted level, the proposed facilities are excluded from environmental processing and need not be considered in conjunction with other co-located and nearby facilities to establish compliance with this standard for uncontrolled exposure.

The proposed facility, in conjunction with other co-located and nearby facilities, will also take appropriate steps to insure that workers who must climb this tower will not be exposed to power densities exceeding the permitted levels for controlled exposure.

This will include a reduction in power or the cessation of operation, as appropriate, by this proposed DTV facility and/or other co-located or nearby facilities at any time that workers must be on this tower in any area where the total power density exceeds the permitted level for controlled exposure.

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