

**THE UNIVERSITY OF NORTH CAROLINA**

**LICENSEE OF WUND-TV**

**EDENTON, NORTH CAROLINA**

**FAC ID# 69292**

**FCC FILE # BLEDT-20070307ABK**

**ANTENNA INSTALLATION  
VARIES FROM  
CURRENT STATION AUTHORIZATION  
PURSUANT to SECTION 73.1690(c)**

**ENGINEERING EXHIBIT 7**

**October 26, 2010**

**THE UNIVERSITY OF NORTH CAROLINA**  
**RESEARCH TRIANGLE PARK, NC**  
**APPLICATION FOR LICENSE**  
**FOR STATION WUND-TV**  
**EDENTON, NORTH CAROLINA**

**EXHIBIT 7 – CONSTRUCTED FACILITY**

**Antenna**

The model of antenna indicated on the current station authorization (BLEDT-20070307ABK) has been replaced with a different model antenna, pursuant to Section 73.1690(c). The newly installed antenna was manufactured by Electronics Research and is a model ATW25H3-ETO-20H.

**Antenna Height**

The difference in the antenna model has resulted in the radiation center being 1 meter lower than indicated on the current station authorization. The actual heights are:

Height of Radiation Center Above Ground:	488 Meters
Height of Radiation Center Above Mean Sea Level:	490 Meters
Height of Radiation Center Above Average Terrain:	488 Meters
Overall Tower Height Above Ground:	500 Meters

The change in the antenna model has resulted in a reduction of the overall height of the structure. The Federal Aviation Administration was notified and approved the reduction in height of the structure through aeronautical study number 2010-ASO-1610-OE. Antenna Structure Registration # 1063239 has also been modified to reflect the change in overall height.

**Antenna Radiation**

The antenna model installed maintains a non-directional azimuth pattern. However the antenna differs electrically from the original antenna by having elliptical polarization. The vertically polarized signal component is 0.20 referenced to the horizontally polarized signal component. The elevation patterns of both the horizontal and vertical polarizations are included in the application as Attachment 7.

## Environmental Considerations

The action being taken has minimal impact on the RF radiation levels at the site. The WUND-TV transmit antenna and one FM transmit antenna located at the station site are required to be considered by 47 CFR 1.1307(b). Other radiation sources at the site contributing less than 5% of the total have not been considered.

WUND-TV utilizes an ERP of 543 kilowatts (average DTV power) with horizontal polarization and 108.6 kilowatts (average DTV power) with vertical polarization. The WUND-TV transmit antenna is a high gain antenna with a power gain of about 25x in the horizontal polarization and a power gain of about 22x in the vertical polarization. The antenna is top mounted on the tower with the antenna approximately 480 meters above the ground. Because of the high gain, the ERP at angles greater than + / - 10 degrees from horizontal is attenuated by a minimum of 20dB. Utilizing Appendix 1 of OET 65, the maximum occupational / controlled exposure level for this frequency is  $1697\mu\text{W}/\text{cm}^2$ . Using equation 9, page 21, the distance to the  $1697\mu\text{W}/\text{cm}^2$  is 11.4 meters.

For general population / uncontrolled environment the maximum exposure level is  $339\mu\text{W}/\text{cm}^2$ . Again, using equation 9, page 21, the distance to the  $339\mu\text{W}/\text{cm}^2$  contour is about 25.4 meters. Since the base of the antenna is approximately 480 meters above ground, the height of the structure limits the possible excessive radiation values to at least 454 meters above the ground.

WUND-FM facility utilizes an ERP of 50 kilowatts horizontal polarization and 47 kilowatts vertical polarization. The WUND-FM antenna is side mounted on the tower at 418 meters above the ground. For occupational / controlled environment and utilizing table 5 of supplement A, the required physical separation is 46.6 meters. Since the radiation center is 418 meters above the ground, the height of the structure limits the possible excessive radiation values to at least 371.4 meters above the ground. For general population / uncontrolled environment, and utilizing table 6 of OET 65, the required physical separation is 101.8 meters. Since the radiation center is 418 meters above the ground, the height of the structure limits possible excessive radiation values to at least 316.2 meters above the ground.

Therefore the total levels of all RFR energy sources at all points on the ground are below that required for protection of both employees and the general public as required by ANSI 95.1-1992 or FCC OET 65, Edition 97-1. The radiofrequency levels do not exceed  $200\mu\text{W}/\text{cm}^2$  at FM frequencies and  $339\mu\text{W}/\text{cm}^2$  at UHF TV frequencies anywhere on the ground in the area of the tower. Neither workers nor the public will be exposed to electromagnetic fields exceeding the maximum permissible (MPE) levels set forth in 47 CFR 1.1310. The antenna support structure is enclosed by a chain-link fence to prevent unauthorized access.

An electromagnetic radiation abatement plan to educate employees and workers as to the potential hazards when working on the tower is in place. Also as a precaution, suitable

signs are posted alerting maintenance personnel to the presence of RFR energy so that appropriate action can be taken when accessing the tower structure.

Where RF fields in excess of FCC guidelines are predicted to be encountered (very near the antennas), signs and protective devices secure the area from the general public. With respect to direct employees of the licensee, OSHA RFR guidelines will be observed. Contractors and other outside workers allowed to access such areas subject to potential exposure shall be advised of the hazard by posted notices and other means. The station shall reduce power or cease operation, if necessary, in order to protect workers on the tower.

With these procedures in place, we believe the WUND-TV operation is in compliance with the RFR energy protection requirements of 47 CFR 1.1307(b).