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Technical Statement for GB Roanoke Licensing LLC

DTV Maximization Construction Permit:

**WFXR-DT
Channel 17
Roanoke, VA**

License Application in File No. BLCDT-20060303AAE

Introduction

This Technical Statement provides the supplemental technical data and information required for an application on FCC Form 301 “Application for Construction Permit for Commercial Broadcast Station” by GB Roanoke Licensing LLC (“Roanoke”) for its digital television facilities at Roanoke, VA. Roanoke seeks a construction permit to maximize the facility of its digital television station, Station WFXR-DT, on Channel 17. WFXR-DT holds an authorized construction permit in File Number BMPCDT-20051208AAY, and its application for a license to cover is in File Number BLCDT-20060303AAE. The current application seeks only to increase the power of the existing WFXR-DT facility. The antenna radiation center will remain at the same height, and the azimuth and elevation patterns will be unchanged. This Technical Statement addresses the additional information required by Section III-D – DTV Engineering of the Form 301 application.

Facility

The only change proposed by the current application is an increase in power from 400 kW to 695 kW ERP. The facility will continue to include the currently authorized side-

mounted antenna on the existing tower. The proposed height above ground level to the center of radiation of the antenna will remain 34 meters. This level corresponds to a height above average terrain of 594 meters. Full specifications for the proposed facility are provided below in Figure 1. Since the location of the antenna on the tower and the location of the tower itself at the Poor Mountain site are unchanged, no tower layout drawing or map of the site is included in this document. Similarly, since the antenna is unchanged, the pattern plots and tabulated data also are not included herewith. Complete specifications of the antenna system and its mounting were provided within the Technical Statement that accompanied the application for the current facilities in File Number BMPCDT-20051208AAY, and they remain unchanged. The contour map required by §73.625(b) is provided in Figure 2.

The combination of height above average terrain (HAAT) and effective radiated power (ERP) proposed for WFXR-DT exceeds the maximum facilities permitted for UHF DTV operations under §73.622(f)(8)(i) of the Commission's rules. It is allowed, however, under §73.622(f)(5), which permits the combination of HAAT and ERP "up to that needed to provide the same geographic coverage area as the largest station within their market." In the case of WFXR-DT, there is in the Roanoke market Station WSLS-DT on Channel 30, with HAAT of 592 m and ERP of 950 kW. According to the Commission's TVFMFS software, which was used in the computations, these parameters on Channel 30 result in an average predicted noise-limited contour (PNLC) distance of 121.4 km, using the dipole-factor-adjusted reception threshold value of 40.32 dBu. On Channel 17, with an HAAT of 594 and using a dipole-factor-adjusted reception threshold value of 39.04 dBu, the same 121.4 km average PNLC contour distance is achieved with an ERP of 695 kW – the value requested in this application. Thus, the proposed facility matches the geographic coverage of the largest station within its market and is permissible under the rules.

Principal Community Coverage

As required by Section 73.625(a)(1), the DTV transmitter location must be chosen so as to put a minimum F(50,90) field strength of 48 dBu over the entire principal community to be served. Section 73.625(a)(2) further requires that "the location of the antenna must

be so chosen that there is not a major obstruction in the path over the principal community to be served.” As demonstrated by the 48-dBu contour on the coverage map of Figure 2, the transmitter location chosen, combined with the other characteristics of the transmission system, does deliver the minimum required field strength over the entire principal community to be served. Furthermore, a shadow study demonstrates that there is not a major obstruction in the path over Roanoke – the principal community.

Interference to Other Stations

Since the proposal is to increase the power of the station, new interference studies were conducted to determine that adequate protection will be provided to all stations within the distances prescribed by the FCC rules. A version of the Commission’s TV_Process program designed to evaluate post-transition interference was used to perform those studies. A summary of the studies is shown in Table 1. In the table, the channel, call sign, city of license, and application record number of each station studied are given in the left four columns. These are followed by the DTV baseline or Class A service contour population in the fifth column, the total population predicted to be impacted by interference with WFXR-DT assumed to be operating with the parameters included in the Table of Allotments (Appendix B) in the sixth column, and the number of scenarios studied for each station in the seventh column. In the two columns on the right, the populations predicted to be impacted by additional interference with use of the proposed facilities are shown alongside the percent changes in population impacted from the Table of Allotment values. The dashes shown on two rows indicate instances in which the TV_Process program reported that the “proposal causes no interference,” meaning that there were no cells in its initial culling study that indicated interference. Thus, in these cases, no further examination was required, and the number of scenarios studied was zero. When multiple scenarios existed and TV_Process studied them, the worst-case population impact was selected for presentation in the table.

Table 1 summarizes sixteen cases involving eight stations implicated in the power increase of WFXR-DT and therefore requiring analysis. Two cases show that analysis beyond the initial culling study was unnecessary. Of the remaining fourteen, two show no predicted change in interference. The other twelve cases all report new predicted

Table 1 – WFXR-DT Interference Studies to Neighboring Stations Using FCC TV_Process Program

Chnl	Station	City	ARN	DTV Baseline / Service Pop	Appendix B Interference Population	Scen- arios	CP Mod Interference Population	% Change
17	WNCN-DT	Goldsboro, NC	BPCDT-20080410AAU	2,315,707	110,186	12	116,493	0.2860
17	WNCN-DT	Goldsboro, NC	DTVPLN-DTVP0606	2,682,804	186,394	12	195,754	0.3749
17	WNCN-DT	Goldsboro, NC	BFRCCCT-20050815AAK	2,682,804	186,394	12	195,754	0.3749
17	WUNE-DT	Linville, NC	BPEDT-20080331AEO	1,145,447	59,134	24	61602	0.2272
17	WUNE-DT	Linville, NC	DTVPLN-DTVP0607	1,131,634	44,814	24	48,765	0.3635
17	WQCW-DT	Portsmouth, OH	BLCDT-20060630AFJ	496,048	3,411	4	3,750	0.0688
17	WQCW-DT	Portsmouth, OH	DTVPLN-DTVP0613	496,048	3,411	4	3,750	0.0688
17	WLTX-DT	Columbia, SC	BLCDT-20050701AAC	1,433,697	93,680	144	93,798	0.0088
17	WLTX-DT	Columbia, SC	DTVPLN-DTVP0619	1,433,697	93,680	144	93,798	0.0088
17	WKOP-DT	Knoxville, TN	BLEDT-20040405ACC	1,234,582	6,878	24	6,878	0.0000
17	WKOP-DT	Knoxville, TN	DTVPLN-DTVP0621	1,234,582	6,878	24	6,878	0.0000
17	WKTD-CA	Portsmouth, VA	BLTTA-20050316ACC	—	—	—	—	—
17	WXOB-LP	Richmond, VA	BPTTA-20030818AAO	722,933	1,295	2	1,306	0.0015
17	WXOB-LP	Richmond, VA	BLTTA-20030809AAN	—	—	—	—	—
18	WDBJ-DT	Roanoke, VA	BLCDT-20020502AAP	1,313,535	17,061	16	20,318	0.2512
18	WDBJ-DT	Roanoke, VA	DTVPLN-DTVP0659	1,313,695	17,104	16	20,243	0.2421

interference to populations smaller than the permitted 0.5 percent of the population not affected by terrain losses. Thus, there is no impermissible interference predicted for the proposed WFXR-DT facility with its effective radiated power increased to 695 kW.

Consideration of Class A Stations

The Commission's Rules specify protection to be afforded by full service stations to both analog and digital LPTV stations that have achieved Class A status.¹ For purposes of this application, the Commission's TV_Process program was used to locate any Class A stations that might be impacted by the power increase of WFXR-DT. The TV_Process program discovered in the CDBS database contour overlaps to two facilities of one Class A station located in Richmond, VA. It also identified one facility of a digital Class A station in Portsmouth, VA with no contour overlap. As shown in Table 1, further analysis of these facilities resulted in a report that the "proposal causes no interference" in two cases and a minuscule amount of new interference, well below the permissible amount, in the other. Thus, there is no impermissible interference to Class A stations predicted for the proposed WFXR-DT facility with its effective radiated power increased to 695 kW.

International Coordination

The WFXR-DT transmitter site is within neither the Canadian nor the Mexican coordination zone. Thus, no coordination with either country is required for this application.

Environmental Impact / Radio Frequency Radiation

The antenna already is installed on an existing tower at an existing transmitter site that is adjacent to a group of other existing transmitter sites. Therefore, none of the conditions of significant environmental effect specified in §1.1307(a) that would trigger the requirement for an Environmental Assessment (EA) exist.

¹ Section 73.623(c)(5), *Minimum technical criteria for modification of DTV allotments included in the initial DTV Table of Allotments and for applications filed pursuant to this section.*

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With respect to Radio Frequency Radiation (RFR), the Maximum Permissible Exposure (MPE) limits in §1.1310 for both General Population/Uncontrolled Exposure and Occupational/Controlled Exposure are computed not to be exceeded in the area surrounding the tower, as determined using methods of OET Bulletin Number 65 and Supplement A thereto (Edition 97-01). The maximum exposure in the area surrounding the tower is calculated to be 45.8 percent of the General Population/ Uncontrolled MPE and 9.2 percent of the Occupational/Controlled MPE.

Given the predicted levels of RFR, the proposed facility is not categorically excluded from the making of measurements to confirm the radiation levels in the region around the tower. Measurements of the radiation levels are made on an occasional basis. The station has established a fenced area to keep the general population away from the tower, and signs are posted to warn of the danger of radiation.

Since the site of the proposed facility is adjacent to the facilities of other stations, GB Roanoke Licensing LLC will undertake to work cooperatively with the other spectrum users in the area to assure protection to workers when they must enter into areas with high radiation levels, such as when necessary to work on antennas and towers, and will reduce power or cease operations as necessary to assure the safety of such workers.

Notifications

The site at Poor Mountain is not in proximity to any of the government radio astronomy installations named in Section 73.1030, nor is it proximate to any of the named radio receiving locations. The nearest FCC monitoring station, furthermore, is over 360 km distant. Thus, none of the notifications mandated or recommended by Section 73.1030 is required in this instance.

Summary

The increase in effective radiated power of the WFXR-DT facility to 695 kW has been shown not to exceed the service area of the largest facility in the market and also has been shown not to produce impermissible interference to any other station. Furthermore, the station is not in an international coordination zone. As a result, the WFXR-DT

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application for a construction permit to increase its power to 695 kW ERP post transition should be immediately grantable.

**Figure 1 — Technical Specifications — Proposed WFXR-DT Facility
Channel 17 — Roanoke, VA**

Frequency

Channel	17
Frequency Band	488 – 494 MHz
Center Frequency	491 MHz

Location

Site	20 km (1.09 miles) North of Roanoke, VA
Geographic Coordinates (NAD27)	37° 11' 47.3" N 80° 09' 15.5" W
Tower Registration (or FAA Study Number)	N/A

Elevation

Elevation of site above mean sea level	1138 m
Overall height of tower above site elevation	56 m
Overall height of tower above mean sea level	1194 m
Height of antenna radiation center above site elevation	34 m
Elevation of average terrain (45-degree spaced radials, 3.2-16.1 km)	578 m
Height of antenna radiation center above mean sea level	1172 m
Height of antenna radiation center above average terrain (HAAT)	594 m

Antenna

Manufacturer	Dielectric
Model	TFU-22JSC-R C180SP
Description	Side-Mounted UHF Center-Fed Slot
Orientation (rotation around vertical axis)	125 degrees true
Electrical beamtilt	1.25°
Mechanical beamtilt	None
Polarization	Horizontal
Gain (in horizontal plane – 0° depression)	15.4 (11.88 dB)
Gain (peak of beam – 1.25° depression)	36.0 (15.56 dB)

Power

Effective radiated power (ERP) (main beam – 1.25° depression)	695 kW
Effective radiated power (ERP) (toward avg. radio horizon – 0.675° dn.)	590.9 kW
Effective radiated power (ERP) (horizontal plane)	299.4 kW

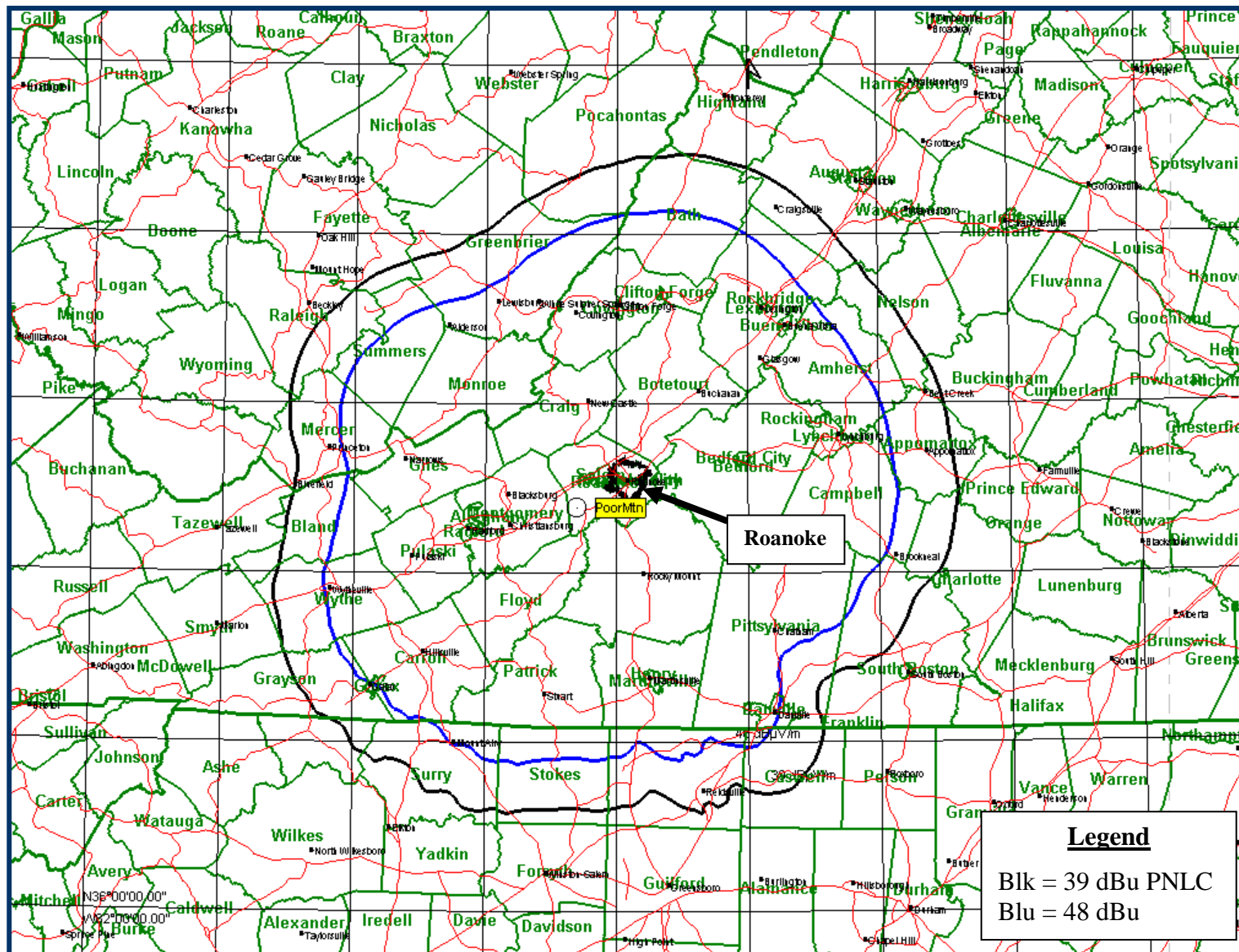


Figure 2 — 39 dBu Noise Limited and 48 dBu Principal Community Contours of Proposed WFXR-DT Facility