

# **ENGINEERING EXHIBIT**

## **Application for an LPTV Station Construction Permit**

prepared for

**NYTV LLC**

WZPJ-LD Bennington, Vermont

Facility ID 46730

Ch. 23 15 kW 518.3 m AMSL

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**COMPREHENSIVE ENGINEERING STATEMENT**  
prepared for  
**NYTV LLC**  
WZPJ-LD Bennington, Vermont  
Facility ID 46730  
Ch. 23 15 kW 518.3 m AMSL

*NYTV LLC* (“*NYTV*”) is the licensee of digital television translator station WZPJ-LD, Channel 23, Bennington, Vermont, Facility ID 46730 (LMS File No. 0000122501). *NYTV* herein requests a minor modification of its authorization to move to a different location. Specifically, *NYTV* proposes to operate from the registered structure ASRN 1004679 with coordinates of 42° 38’ 13.0” N Latitude and 74° 00’ 03.0” W Longitude (NAD 83) at 15 kW Effective Radiated Power, using an omni-directional antenna centered at 518.3 meters AMSL.

### **Nature of the Proposal**

The proposed antenna system for the WZPJ-LD operation is a directional antenna which will be side-mounted on an existing tower structure with the Antenna Structure Registration Number 1004679. No change in structure overall height is necessary to carry out this proposal. Since no change to the structure’s overall height is proposed, no change to structure marking/lighting requirements set forth in the aeronautical study will result.

The proposed digital facility will operate on Channel 23 using a “Full Service” out of channel emission mask, a maximum effective radiated power of 15 kW, and an antenna height of 518.3 meters AMSL. **Figure 1** depicts the 51 dBμ F(50,90) contour of the licensed facility, the proposed 51 dBμ F(50,90) coverage contour, as well as the 48 km (30 mile) move limit for minor modifications from the licensed coordinates. As demonstrated on the provided map, the service area overlap shown demonstrates compliance with §74.787 of the Rules for minor modifications.

### **Allocation Considerations**

The instant proposal complies with the Commission’s interference protection requirements toward all DTV, television translator, LPTV, and Class A stations. A detailed interference study was conducted using the FCC’s TV Study program version 2.2.5<sup>1</sup>. The interference study results are provided as an attachment to this Engineering Statement and show that any new interference does not

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<sup>1</sup> The TV Study program was configured to perform its calculations using a cell size of 1.0 km and a terrain profile increment of 0.1 km. It is believed that this setting better reflects terrain variations than the default setting.

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exceed the Commission's interference limits (0.5 percent to full service and Class A stations or 2.0 percent to LPTV stations). Accordingly, the instant proposal complies with FCC Rules regarding interference protection to DTV, television translator, LPTV and Class A television facilities.

### **International Coordination**

The proposed transmitter site is located 246.5 km from the U.S.-Canadian border. However, the worst case 24.66 dBμ interfering contour does not cross the border. The proposal is also 2,786.6 km from the U.S.-Mexican border, which is greater than the required coordination distance specified for digital low power television stations. Thus, it is believed that international coordination will not be necessary for the instant proposal.

### **Other Allocation Considerations**

The nearest FCC monitoring station is at Canandaigua, NY, at a distance of 268.2 km from the proposed site. This exceeds by a great margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The proposed site is also located outside the areas specified in §73.1030(a)(1) and §73.1030(b). Thus, notification of the instant proposal to the National Radio Astronomy Observatory at Green Bank, West Virginia, or the Table Mountain Radio Receiving Zone in Boulder County, Colorado is not required. There are no AM broadcast stations located within 3.2 km (2 miles) of the proposed site, according to information extracted from the Commission's engineering database.

### **Environmental Considerations**

The instant proposal is not believed to have a significant environmental impact as defined under §1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required. *NYTV* herein proposes to construct the facility on an existing tower structure with the Antenna Structure Registration Number 1004679. The use of an existing tower structure has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. No change in structure height is proposed, thus no change in current structure marking and lighting requirements is anticipated. Therefore, it is believed that this

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application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

**Human Exposure to Radiofrequency Electromagnetic Field**

The proposed operation was evaluated for human exposure to radiofrequency electromagnetic field using the procedures outlined in the Commission's OET Bulletin 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The WZPJ-LD Channel 23 antenna center of radiation will be 55 meters above ground level. An effective radiated power of 15 kilowatts, elliptically polarized, will be employed utilizing an Alive model ATC-BCE6100-V3-23 omni-directional UHF low power antenna. Based on the manufacturer's data, a "worst-case" relative field value of 15 percent is assumed for purposes of the calculation. **Figure 2** provides a graphical representation of the manufacturer's elevation pattern for the antenna. For simplicity, circular polarization is assumed as a worst case. The "uncontrolled/general population" limit specified in §1.1310 for Channel 23 (center frequency 527 MHz) is  $351.3 \mu\text{W}/\text{cm}^2$ .

OET 65's formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For the DTV facility in the instant proposal, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the average power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (10) in OET 65.

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where:

- S = power density in microwatts/cm<sup>2</sup>
- ERP = total (average) ERP in Watts
- F = relative field factor
- D = distance in meters

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Using this formula and the above assumptions, the proposed facility would contribute a power density of  $8.0 \mu\text{W}/\text{cm}^2$  at two meters above ground level near the antenna support structure, or 2.28 percent of the general population/uncontrolled limit.

§1.1307(b)(3) states that facilities at locations with multiple transmitters (such as the case at hand) are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities using this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower site access will continue to be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will continue to be posted.

#### **Safety of Tower Workers and the General Public**

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level or near the base of the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, access will be restricted and controlled through the use of a locked gate. Additionally, appropriate RF exposure warning signs will be posted.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower or in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be

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expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines would otherwise be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

**Conclusion**

Based on the preceding, it is believed that the instant proposal complies with all Commission Rules and policies.

**FIGURE 1**  
**COVERAGE CONTOUR COMPARISON**

*prepared October 2020 for*

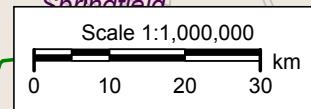
**NYTV LLC**  
**WZPJ-LD Bennington, VT**  
**Facility ID 46730**  
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**Cavell, Mertz & Associates, Inc.**  
Manassas, Virginia

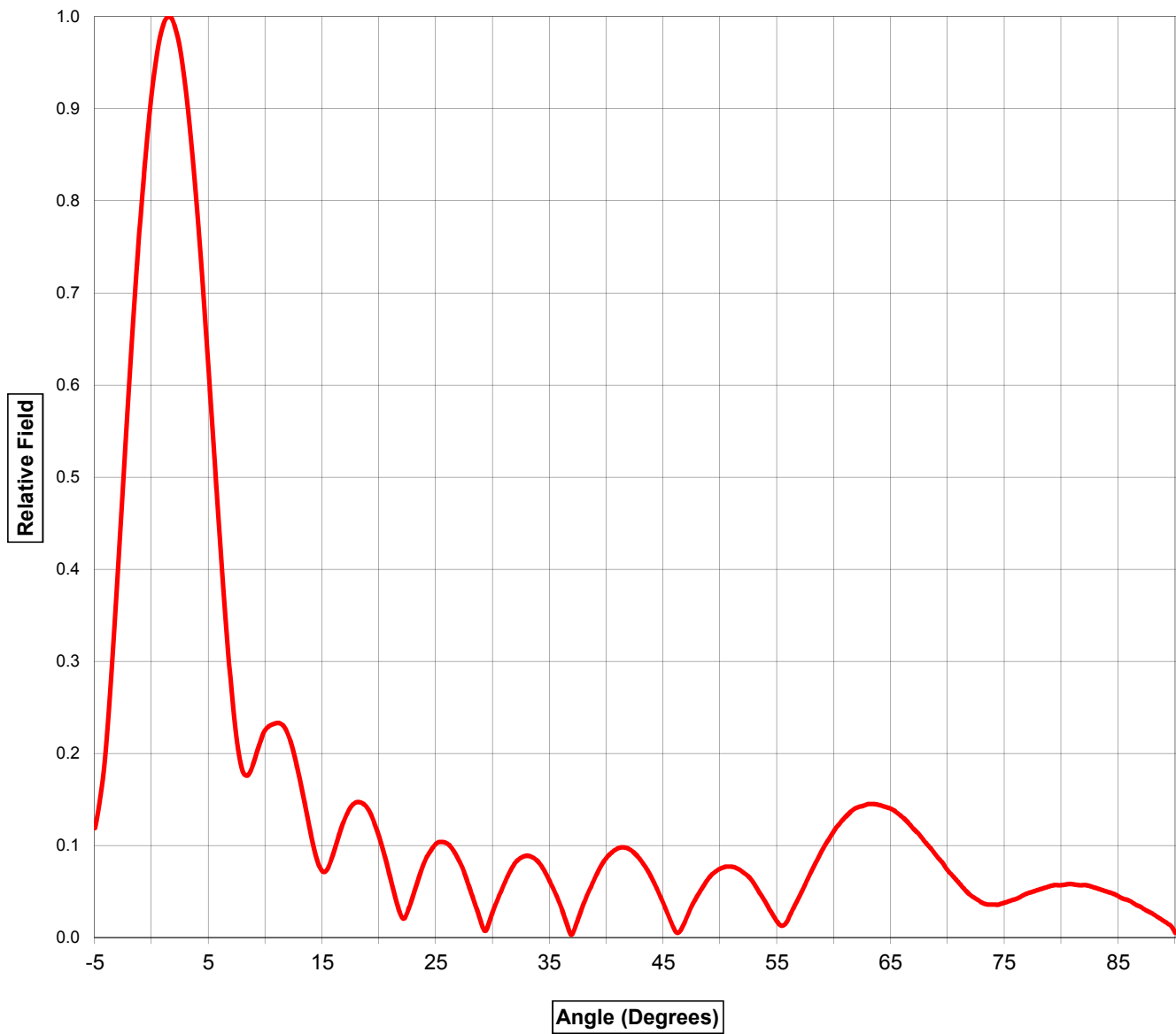
**48 km (30 Mile) Move Limit Radius**

**WZPJ-LD Proposed**  
Ch 23 15 kW  
51 dBμ F(50,90)  
TX Site

**WZPJ-LD License**  
Ch 23 8 kW  
51 dBμ F(50,90)



**Relative Field Pattern**



**FIGURE 2**  
**ANTENNA VERTICAL (ELEVATION)**  
**PLANE RADIATION PATTERN**

prepared October 2020 for

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Manassas, Virginia