

ENGINEERING EXHIBIT

Modification of a Licensed Facility for LPTV Station Application

prepared for

Station X, Inc.
WEXZ-LD Bangor, Maine
Facility ID 183296
Ch. 5 (Digital) 3 kW

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FCC Form 2100, Schedule C – Engineering Data (Digital)

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Statement A
COMPREHENSIVE ENGINEERING STATEMENT
prepared for
Nelson TV, Inc.
WEXZ-LD Bangor, Maine
Facility ID 183296
Ch. 5 (Digital) 3 kW

Station X, Inc. (“*Station X*”) is the licensee of low power television station WEXZ-LD, Channel 5, Bangor, Maine, Facility ID 187839 (LMS File No. 0000018958). *Station X* has lost access to its tower site and needs to relocate its transmitter to a different site. Under the provisions of the FCC’s minor change rules for low power television stations, *Station X* herein proposes to operate from a different location.

Nature of the Proposal

The proposed antenna system for the WEXZ-LD operation is an omni-directional ERI Model CUSTOM CH5 which will be top-mounted on the roof of the station’s studio building. The overall height of the structure will be less than 200’ and does not require Antenna Structure Registration.

The proposed digital facility will operate on Channel 5 using a “simple” out of channel emission mask, a maximum effective radiated power of 3 kW, and an antenna height of 153.3 meters AMSL. **Figure 1** depicts the 43 dB μ F(50,90) coverage contours of the authorized and proposed facilities. As shown on the provided map, the proposed service area overlaps the licensed service area. In addition, the proposed site is located 42.1 km from the licensed site which is less than 30 miles (48.3 km), thus complying with 74.787(b)(2) for a displacement application.

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 in accordance with the terrain dependent Longley-Rice point-to-point propagation model, per the Commission’s Office of Engineering and Technology Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 (“OET-69”)¹. The

¹ The implementation of OET-69 for this study (*TV Study*) followed the guidelines of OET-69 as specified therein. **A cell size of 1 km was employed.** Comparisons of various results of this computer program (run on a Sun processor) to the Commission’s implementation of OET-69 show excellent correlation.

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interference study examined the change in interference as experienced by nearby pertinent stations that would result from the proposed facility.

The results of this study shows that any new interference does not exceed the Commission's interference limits (0.5 percent to full service and Class A stations, and 2.0 percent to secondary stations). Accordingly, the instant proposal complies with §74.793 regarding interference protection to analog and digital television, low power television, television translator, and Class A television facilities.

International Coordination

The proposed transmitter site is located 121 km from the closest point on the U.S.-Canadian border. According to informal conversations with FCC staff, coordination is necessary when the interfering contour crosses the Canadian border. For the case at hand, as well as the existing license, the interfering contour is the 13 dB μ F(50,10) which extends at least 195 km in all directions and both the eastern and western international borders of Maine. It is believed that there are no Canadian co-channel or first adjacent digital television stations that will be affected by the proposed operation.

Other Allocation Considerations

The nearest FCC monitoring station is at Belfast, ME, at a distance of 42 km from the proposed site. The signal strength from the proposed operation will be significantly less than the 10 mV/m (80 dB μ) maximum specified in §73.1030(c)(1). Also, the proposed operation is farther from the Belfast, ME facility than the licensed site. 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

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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. *Station X* herein proposes to construct the proposed facility atop an existing building which does not require Antenna Structure Registration.

The use of existing antenna support structures 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 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 WEXZ-LD Channel 5 antenna center of radiation will be 30.2 meters above ground level. An effective radiated power of 3 kilowatts, horizontally polarized, will be employed utilizing an ERI model CUSTOM CH5 omni-directional antenna. A "worst-case" relative field value of 50 percent (from 10° to 90° below the horizontal) is assumed for purposes of the calculation. The "uncontrolled/general population" limit specified in §1.1310 for Channel 5 (center frequency 79 MHz) is 200 $\mu\text{W}/\text{cm}^2$.

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

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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/cm²
- ERP = total (average) ERP in Watts
- F = relative field factor
- D = distance in meters

Using this formula and the above assumptions, the proposed facility would contribute a power density of 31.5 μ W/cm² at two meters above ground level near the antenna support structure, or 15.8 percent of the general population/uncontrolled limit.

There are no other broadcast facilities nearby the proposed location, therefore the contribution of the proposed WEXZ-LD is shown to be less than the MPE at ground level locations. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor as defined under §1.1307(b).

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, roof access will be restricted and controlled through the use of a locked door. 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 or at the base of the top mounted tower structure. 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

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in excess of the guidelines may be 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 September 2017 for
Station X, Inc.
WEXZ-LD Bangor, Maine
Ch. 5 (Digital) 6 kW

Cavell, Mertz & Associates, Inc.
Manassas, VA

43 dBu F(50,90)
Proposed WEXZ-LD
Service Contour

43 dBu F(50,90)
Licensed WEXZ-LD
Service Contour

