

ENGINEERING EXHIBIT

Modification of a Licensed Facility for LPTV Station Application

prepared for

Nelson TV, Inc.
WSPY-LD Earlville, Illinois
Facility ID 187840
Ch. 30 (Digital) 12 kW-Max DA

Table of Contents

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

Statement A	Comprehensive Engineering Statement
Attachment	TV_Study Interference Report

This material supplies a “hard copy” of the engineering portions of this application as entered April 20, 2018 for filing electronically. Since the FCC’s electronic filing system may be accessed by anyone with the applicant’s name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.

Statement A
COMPREHENSIVE ENGINEERING STATEMENT
prepared for
Nelson TV, Inc.
WSPY-LD Earlville, Illinois
Facility ID 187840
Ch. 30 (Digital) 12 kW-Max DA

Nelson TV, Inc. (“*Nelson*”) is the licensee of low power television station WSPY-LD, Channel 32, Earlville, Illinois, Facility ID 187840 (LMS File No. 0000013326). *Nelson* also holds an FCC Construction Permit to relocate WSPY-LD under LMS File No. 0000013459, with a pending License to Cover application (File No. 0000016586). WSPY-LD is displaced by greater than 2% incoming interference from full service and Class A Low Power television stations as a result of the TV Band Repack¹. Under the provisions of the FCC’s Special Displacement Filing Window for low power television stations and television translators, *Nelson* requests a displacement channel change to Channel 30.

Nature of the Proposal

The proposed antenna system for the proposed WSPY-LD operation is a directional antenna model ERI ALP-OC oriented at 20°T North which will be side-mounted on the tower bearing ASR number 1010527 at 106.7 meters AMSL. 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 30 using a “stringent” out of channel emission mask, a maximum effective radiated power of 12 kW, and an antenna height of 308.4 meters AMSL. **Schedule C - Figure 1** depicts the 51 dBμ F(50,90) coverage contours of the authorized and proposed facilities. As demonstrated on the provided map, the service area overlap shown demonstrates compliance with §74.787(b)(1)(ii). The proposed site is located 42.2 km from the licensed (File No. 0000013326) coordinates, and is located at the same site as the pending License application (File No. 0000016586) for WSPY-LD, thus complying with §74.787(b)(1)(iii) for a minor change application. The transmitter site location is 29.85 km

¹ Specifically, WSPY-LD (File No. 0000013326) is predicted to receive 6.5% interference from W31DT-D (File No. BDCCDTL-20110726AJF), 6.6% interference from a pending WLS DRT translator (File No. BDRTCDT-20090630AFT) and 8.3% interference from WLPD-CD’s Post Transition Channel 32 CP (File No. 0000034861).

Schedule C - Statement A
COMPREHENSIVE ENGINEERING STATEMENT
(Page 2 of 5)

(18.55 miles) from the Earlville, IL city coordinates, thus complying with §74.787(a)(4) of the Rules for a displaced translator.

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. The interference study results are provided as an attachment to this Engineering Statement and show 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 for both pre and post transition.

International Coordination

The proposed transmitter site is located 451 km from the U.S.-Canadian border, which is greater than the 100 km required coordination distance specified for digital low power television stations in the Letter of Understanding² and is greater than the 400 km distance required for full-service facilities. 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 Allegan, MI, at a distance of 240 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

² The Letter of Understanding Between the Federal Communications Commission of the United States of America and Industry Canada Related to the Use of the 54-72 MHz, 76-88 MHz, 174-216 MHz and 470-806 MHz Bands for the Digital Television Broadcasting Service Along the Common Border, September 29, 2000, paragraph 12.

Schedule C - Statement A
COMPREHENSIVE ENGINEERING STATEMENT
(Page 3 of 5)

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. *Nelson* herein proposes to construct the proposed facility on an existing tower with ASR Number 1010527.

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 WSPY-LD Channel 30 antenna center of radiation will be 106.7 meters above ground level. An effective radiated power of 12 kilowatts, horizontally polarized, will be employed utilizing a ERI Model ALP-OC directional antenna. A "worst-case" relative field value of 20 percent (from 15° to 90° below the horizontal) is assumed for purposes of the

Schedule C - Statement A
COMPREHENSIVE ENGINEERING STATEMENT
(Page 4 of 5)

calculation. The “uncontrolled/general population” limit specified in §1.1310 for Channel 30 (center frequency 569 MHz) is 379.3 $\mu\text{W}/\text{cm}^2$.

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/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 1.4 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 0.4 percent of the general population/uncontrolled limit.

§1.1307(b)(3) states that facilities are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent of the exposure limit. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities near 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).

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, site access will continue to be

Schedule C - Statement A
COMPREHENSIVE ENGINEERING STATEMENT
(Page 5 of 5)

restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will continue to 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 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.