

## **Comprehensive Engineering Statement**

prepared for

### **Lutheran Church-Missouri Synod**

K224FT St. Louis, MO

Facility ID 202990

Channel 224D 0.025 kW 221 m AMSL

Lutheran Church-Missouri Synod (“*Lutheran*”), seeks to modify K224FT to specify a different transmitter location. The instant application is a modification of Construction Permit file number BNPFT-20181011ABN. K224FT is currently associated with Broadcast Station KFUE(AM), Clayton, Missouri. In particular, *Lutheran* proposes to move to the registered tower with ASRN 1271750, use the same antenna at a height of 48.8 meters above ground, and specify an ERP of 0.025 kW (25 Watts).

### **Allocation Considerations**

The location of the 60 dB $\mu$  coverage contour of the licensed and proposed translator lies within the 2 mV coverage contour of KFUE(AM), as shown in the map provided as **Figure 1**. As demonstrated, the existing and the proposed translator coverage contours remain completely within the contour of KFUE(AM), thus complying with §74.1201(j).

A study of nearby FM facilities on co-channel, adjacent-channel, and intermediate frequencies was conducted to identify which stations require further study to demonstrate compliance under §74.1204. Contour protection for pertinent co-channel and first adjacent stations is demonstrated in **Figure 2**. The nearest co-channel channel full service station is WUSW(FM) (Ch. 224B1, Taylorville, IL) and the nearest co-channel LPFM is KFTN-LP, (Ch. 224L1, Fenton, MO) at 29.93 km. The nearest first adjacent channel stations are KWRH-LP (Ch 225L1, Webster Groves, MO) at 25.93 km, and full service KGRC(FM) (Ch. 225C1, Hannibal, MO) at 130.25 km. As shown, no prohibited contour overlap from the proposed facility will exist to co-channel or first adjacent facilities.

Of the nearest 2<sup>nd</sup> or 3<sup>rd</sup> adjacent channel stations, WIL-FM (Ch. 222C0, St. Louis, MO) is the only facility requiring attention. The proposed K224FT facility will be located inside the WIL-FM 60 dB $\mu$  contour. Protection of WIL-FM is achieved pursuant to §74.1204(d) by demonstrating that the proposed translator’s interfering contour does not reach populated areas. The proposed facility’s transmitter site is located at the 77.6 dB $\mu$  contour of WIL-FM. Thus, based on the -40 dB desired-to-undesired ratio specified in §74.1204(a)(3), the appropriate second-adjacent

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interfering signal level at this location is 117.6 dBμ. The calculated radius distance to the proposed translator's 117.6 dBμ contour is 46 meters. The proposed facility's antenna will be mounted at 48.8 meters above ground level. Thus, the proposed translator's interfering signal does not exceed the level of 117.6 dBμ that would be considered interference to surrounding population at ground level or nearby buildings. There are no IF relationship (53 or 54 channels removed) facilities near to the proposal.

The proposed site is located more than 700 km from the Canadian or Mexican borders, well beyond the 320 km coordination distance required for translators specified in §74.1235(d). The nearest FCC monitoring station is 572.6 km distant at Allegan, MI. This distance exceeds the threshold minimum distance specified in §73.1030 that would suggest consideration of the monitoring station.

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect regarding allocation matters.

### **Environmental Considerations**

The proposed facility will operate with a vertically-polarized ERP of 25 Watts with a single bay, directional antenna, at 48.8 meters AGL on registered tower, ASRN 1271750, which also provides support for a number of other broadcast facilities. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. Because no change in structure height is proposed, 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 Radiation**

The proposed operation was evaluated for human exposure to radiofrequency energy using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility meets 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

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that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The general population/uncontrolled maximum permitted exposure (“MPE”) limit specified in §1.1310 for the entire FM broadcast band is  $200 \mu\text{W}/\text{cm}^2$ . For the purpose of this study, “public access” will be considered at the base of the tower at a location two-meters above ground.

Using the FCC’s FM Model program and a worst-case EPA Type 1 antenna it was determined that the proposed facility would contribute a worst-case RF power density of  $0.115 \mu\text{W}/\text{cm}^2$  at two meters above ground level near the antenna support structure, or 0.0575 percent of the general population/uncontrolled limit.

§1.1307(b)(3) states that facilities at locations with multiple emitters are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent of the pertinent MPE 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 ground level as defined under §1.1307(b).

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

As demonstrated herein, excessive levels of RF energy will not be caused by the proposal 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 access will continue to be restricted and controlled through the use of a locked fence. According to information provided by the applicant, appropriate RF exposure warning signs are posted. In the event that maintenance or other workers gain access to the tower, power output of the translator will be decreased or shut off to protect workers.

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 in areas where high RF levels may be present. Such protective measures may include, but

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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. Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under §1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

### **Conclusion**

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect.



**EXHIBIT 12 - FIGURE 2  
CONTOUR PROTECTION**

*prepared March 2019 for*

**Lutheran Church-Missouri Synod  
K224FT St. Louis, MO  
Facility ID 202990  
Ch. 224D 0.025 kW 48.8 m AGL**

**Cavell, Mertz & Associates, Inc.  
Manassas, Virginia**

**WUSW(FM) License**  
Co-Channel 224B1  
60 dBμ F(50,50)

**KGRC(FM) License**  
1st Adjacent 225C1  
57 dBμ F(50,50)

**K224FT Proposed**  
Ch 224D 0.025 kW  
60 dBμ F(50,50)

51 dBμ F(50,10)

40 dBμ F(50,10)

37 dBμ F(50,10)

**KFTN-LP License**  
Co-Channel 224L1  
60 dBμ F(50,50)

**KWRH-LP License**  
1st Adjacent 225L1  
60 dBμ F(50,50)

