

Comprehensive Engineering Statement

prepared for

Viper Broadcasting, LLC

KFNS-FM Troy, MO

Facility ID 29944

Ch. 264A 6 kW 99.3 m

Viper Broadcasting, LLC (“*Viper*”) is the licensee of KFNS-FM, Channel 264A, Troy, MO, (FCC Facility ID 29944, FCC File Number BLH-20151229AFN). *Viper* herein provides notification of its transmitting antenna replacement on the same registered tower (ASRN 1065466). The antenna replacement has been performed per §73.1690 (c)(1) of the Commission’s Rules. Per the same Rule Section and §73.1620(a)(1), KFNS-FM is operating at the authorized ERP.

Antenna Replacement Requirements

Viper has replaced the authorized KFNS-FM 3-bay antenna with an omni-directional 6-bay antenna on the same tower authorized in its License. The center of radiation of the replacement antenna is 108 meters above ground level, for an antenna height of 284.8 meters AMSL. The licensed antenna height is 288.8 m AMSL. The instant proposal is within the required +2/-4 meter requirement found in §73.1690 (c)(1) for omnidirectional antenna replacements.

Attachment I provides the Manufacturer’s gain specification for Channel 264 (100.7 MHz). **Attachment I** also provides the vertical (elevation) pattern for the 6-bay antenna. **Attachment II** is a PDF statement from a qualified engineer who oversaw the installation of the omnidirectional antenna, certifying the antenna center of radiation.

The replacement antenna is a new Shively model 6813-6R 6-Bay, full wavelength spaced antenna to be used by KFNS-FM.

Figure 1 depicts the 60 dB μ Service Contour and the 70 dB μ City Grade contour coverage using the authorized parameters. As demonstrated, the proposed antenna provides a City Grade contour that fully encompasses the community of license, Troy, MO.

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Green Bank, Monitoring Station, International Considerations

The facility is located outside the Green Bank coordinates identified in §73.1030(a)(1). The site is located 740.8 km from Canada and 1,405.6 km from the Mexican border, well beyond the 320 km coordination distance for both countries. The nearest FCC monitoring station is 579.93 km distant at Allegan, Michigan. With respect to AM stations, the nearest non-directional AM station is KYRO (1280 kHz, Troy, MO) which is co-located on the same tower as the proposal.

According to §1.30003(a) of the Rules, a construction on a tower utilized by a non-directional AM antenna requires additional attention:

§ 1.30003(a) Installations on a nondirectional AM tower

(a) Installations on a nondirectional AM tower. When antennas are installed on a nondirectional AM tower the AM station shall determine the operating power by the indirect method (see § 73.51 of this chapter). Upon completion of the installation, antenna impedance measurements on the AM antenna shall be made. If the resistance of the AM antenna changes by more than 2 percent (see § 73.45(c)(1) of this chapter), an application on FCC Form 302-AM (including a tower sketch of the installation) shall be filed with the Commission for the AM station to return to direct power measurement.

Per § 1.30003(a) of the Rules, coordination was performed with KYRO(AM) so that indirect measurements of power could be performed during construction. Tower impedance measurements were performed after construction, and no change in impedance was noted. The resistance of the tower remains at 196 ohms according to information provided by the Licensee, in compliance with the KYRO license. The same tower and configuration is used by KYRO for both day and night time operation. Therefore, no filing is required to cover changes to KYRO. There are no other AM facilities within 3.2 km of the proposed site.

Environmental Considerations

The facility utilizes a Shively 6813-6R-EF 6-bay (EPA Type 1 (Ring-and-Stub or “Other”)) antenna with a full wavelength bay spacing at the operating frequency of 100.7 MHz. It is an omni-directional, circularly-polarized antenna at 108 meters AGL on registered tower

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ASRN 1065466. 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

In keeping with §1.1307(b) of the Commission's Rules, the operation has been evaluated for human exposure to radiofrequency energy using the procedures outlined by the Federal Communications Commission in FCC OET Bulletin 65 ("OET-65"). OET-65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines specified in §1.1310 of the Commission's Rules. Under present Commission policy, a facility may be presumed to comply with the limits in §1.1310 of the Commission's Rules 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 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 near the base of the structure at locations two meters above ground. Using the FCC's FM Model program and an EPA Type 1 (Ring-and-Stub) antenna it was determined that the proposed facility would contribute a worst-case RF power density of $20.63 \mu\text{W}/\text{cm}^2$ at two meters above ground level and a distance of 18.8 meters from the antenna support structure, or 10.3 percent of the general population/uncontrolled limit.

KFNS(FM) and KYRO(AM) occupy the same existing registered tower (ASR 1065466). Calculations for KYRO(AM) are for the nearest publicly accessible location to the tower, which is outside the fenced area surrounding the KYRO transmitting tower. The daytime KYRO(AM) operation specifies 0.66 kW at 1,280 kHz. A rectangular fence surrounds the tower, with the closest fence distance of 1.54 meters, or 5 feet from the tower. The tower height is 180.8 degrees at the operating frequency. Using the AM OET 65 tables and formulas, the KYRO operation would have an E value of 216.51 V/m, or 12.43% of the Uncontrolled General Population limit,

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and an H value of 0.112, or 0.48% of the Uncontrolled General Population limit at 1.54 meters from the tower. Summing the worst case calculations for each station, the maximum calculated RF exposure level would be 23.73 percent of the General Population/Uncontrolled Limit. 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).

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

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 continue to 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 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 will 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 Section 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.

FIGURE 1
KFNS-FM COVERAGE CONTOURS

prepared March 2022 for

Viper Broadcasting, LLC
KFNS-FM Troy, MO
Facility ID 29944
Ch. 264A 6 kW 99.3 m HAAT

Cavell, Mertz & Associates, Inc.
Manassas, Virginia

KFNS-FM License
6 kW 99.3 m HAAT
60 dBμ F(50,50)
70 dBμ F(50,50)

