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November 30, 2017

Mr. George Baskos
Longmont Community Radio
457 Fourth Avenue
Longmont, CO 80501

Re: KGUD (FM), Longmont, CO
Longmont Community Radio
Facility Identification Number: 62178
License application BLED-20171114AAU

Dear Mr Baskos:

This is in reference to the license application and request for program test authority you filed on November 14, 2017 for FM station KGUD, Longmont, CO. For the reasons set forth below, program test authority is DENIED: KGUD may not operate from the constructed facility specified in the license application.¹ We request an amendment to the license application to provide suitable documentation about the directional antenna installation and performance.

Construction permit BPED-20141216AAD contained several conditions relating to documenting proper performance of the directional antenna proposed therein. These conditions are as follows:

2. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit the results of a complete proof-of-performance to establish the horizontal plane radiation patterns for both the horizontally and vertically polarized radiation components. This proof-of-performance may be accomplished using the complete full size antenna, or individual bays therefrom, mounted on a supporting structure of identical dimensions and configuration as the proposed structure, including all braces, ladders, conduits, coaxial lines, and other appurtenances; or using a carefully manufactured scale model of the entire antenna, or individual bays therefrom, mounted on an equally scaled model of the proposed supporting structure, including all appurtenances. Engineering exhibits should include a description of the antenna testing facilities and equipment employed, including appropriate photographs or sketches and a description of the testing procedures, including scale factor, measurements frequency, and equipment calibration.
3. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee must submit a certification executed by a licensed surveyor showing that the FM directional antenna system has been oriented at the azimuth(s) specified in the directional antenna proof of performance. This certification must include a description of the method used by the surveyor to determine the azimuth(s) of the installed directional antenna system and the accuracy of that determination.
4. BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee/licensee shall submit an affidavit that the installation of the directional antenna system was overseen by a qualified engineer. This affidavit shall include a certification by the engineer that the antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.

¹ However, KGUD may continue to operate with the earlier licensed facility, under license BLED-19821018AU.

5. BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit an exhibit demonstrating that the measured directional antenna pattern complies with the appropriate community coverage provisions of 47 C.F.R. Sections 73.315 or 73.515 (See 47 C.F.R. Section 73.316(c)(2)(ix)(B)).

6. The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit.

A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power:

1.0 kilowatts.

Principal minima and their associated field strength limits:

352 - 42 degrees True: 0.032 kilowatts

As can be seen by the last condition (No. 6), the directional antenna must be designed to limit radiation to no more than 32 watts from 0° to 42°, and from 352° to 360°, as referenced to True North.²

The license application specifies use of a Micronetixx Antenna, model no. "FML CP FM" antenna. The documentation provided refers to this antenna as a circularly polarized low power FM and FM translator antenna,³ and describes it as having "outstanding circularity" (implying omnidirectional operation). The power gain of the standard antenna is listed as 0.49 for a single antenna bay.

The mechanical sketch of the antenna installation shows a 10 foot tall "outrigged" pole standing off the tapered tower at an unspecified distance, at a bearing of 197° degrees from the tower face, oriented at 155°.⁴ The actual antenna is mounted to this outrigged pole. The license application includes a surveyor's statement⁵ and an engineer's certification⁶ that the antenna is installed in the manner prescribed. With this mounting, according to Micronetixx, this should "launch the best C/P [circularly polarized] signal" and "the installed pattern should be close to what we test."⁷

² This pattern suppression is necessary to prevent prohibited contour overlap (under Section 73.509 of the Commission's rules) with first-adjacent channel station KCSU-FM, Fort Collins, CO to the north, as well as cochannel station KENC-FM, Estes Park, CO to the northwest.

³ See the "Ant descr.pdf" exhibit in the license application.

⁴ Exhibit "Mount Dwg.pdf".

⁵ Exhibit "Scan ant inst info into a.pdf".

⁶ Exhibit "MEMOFORM windriver.pub.pdf".

⁷ Exhibit "Mfr mount inst.pdf"

Micronetixx supplied a directional relative field pattern plot and a tabulation to show that the “measured” blue pattern stays completely inside the red “calculated” pattern.⁸ The tabulation indicates that the measurements were “taken with [the] antenna bay mounted on [a] 10 foot long 3 inch nominal diameter pole” with “no other structures present”, to “replicate[] monopole mounting”.

However, we are not persuaded that the antenna, when mounted in the manner described by Micronetixx, will produce anything like the sharply directional pattern required by KGUD’s construction permit. Generally, mounting in the offset manner described is intended to minimize the effects of the tower structure on the antenna pattern. Given that the licensee is employing a standard nondirectional antenna bay without parasitics or reflectors, it would appear that the resulting pattern should be essentially omnidirectional. Micronetixx’s “measured” patterns do nothing to alter this perception. Not only does Micronetixx fail to accurately describe the test setup (as required by Condition #2 above), it does not provide separate measurements or tabulations for the horizontally and vertically polarized components.⁹

Nor does Micronetixx provide the modified antenna gain for the directional antenna. By changing the antenna pattern from omnidirectional, the power gain of the antenna changes also (usually increasing). This affects the transmitter output power required to achieve the authorized effective radiated power.

Consequently, our analysis concludes that KGUD has not established compliance with the directional antenna pattern and conditions specified in its construction permit. Until we can verify compliance, KGUD will not be permitted to operate with the installation specified in the license application. We will afford the licensee 45 days from the date of this letter, to provide an amendment to license application BLED-20171114AAU:

- 1) A description of measurement procedure and equipment, and of the antenna / tower installation under test, as required by Condition #2 above;
- 2) Measured pattern results must include separate horizontally and vertically polarized components, plotted to the same scale (relative field), along with the composite directional pattern authorized by construction permit BPED-20141216AAD. A tabulation of the relative field values for the H and V components, and the authorized composite pattern, must be included;
- 3) A determination of the new directional antenna gain by the manufacturer;
- 4) A calculation showing the transmitter output power needed to achieve the authorized 1 kW ERP (H&V);
- 5) A showing that the measured pattern will provide coverage to the community of license (Condition No. 5 above); and

⁸ Exhibits “Pat dwg 2.pdf” and “Azimuth tabul.pdf”.

⁹ We do not know whether Micronetixx’s “measured” patterns are the horizontally polarized component, the vertically polarized component, or a composite of the two patterns. For a directional antenna, the horizontally polarized and vertically polarized components may be completely different in size and shape.

6) If changes are made to the present antenna installation, new statements in accordance with Conditions Nos. 3 and 4 above.

Further action on the license application and the request for program test authority will be withheld until after we receive and review the requested information. Failure to respond by January 16, 2018 will result in dismissal of the license application and the cancellation of the underlying construction permit.

Sincerely,



Dale Bickel
Senior Engineer
Audio Division
Media Bureau

cc: George Baskos (via e-mail)