COMPREHENSIVE TECHNICAL EXHIBIT
APPLICATION FOR MODIFICATION OF LICENSE

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FM Translator Station K253BE
0.250 kW ERP / 98.5 MHz
Iowa City, Iowa

KZIA, Inc.

April, 2016

APPLICATION FOR MODIFICATION OF LICENSE

The following engineering statement has been prepared for **KZIA, Inc.** ("KZIA"), licensee of FM translator station K253BE at Iowa City, Iowa, and is in support of their application for modification of license.[1] This application is being filed to modify the transmitter power output specified in the original application for license. The original license application is under FCC File No. BLFT-20160307ABR.

K253BE is co-located with FM translator station K292FZ at Iowa City, Iowa.[2] K292FZ is also licensed to KZIA. Upon the completion of the construction of K253BE, and the commencement of operation, an abnormally high reflected power was observed on the transmitter. This high level of reflected power was only present when K292FZ was transmitting. Upon investigation of the high reflected power, it was determined that as a result of their proximal locations, a substantial amount of coupling between the K292FZ and K253BE antennas was occurring.

In addition to the abnormally high VSWR indications, spectrum analyzer measurements indicated that spurious emission products were being generated in each KZIA translator due to the coupling of the other through the antenna systems. The operation of K253BE was immediately suspended pending the receipt of bandpass filters from Shively Labs to alleviate the coupling between the transmitters, and by extension, the generation of spurious emission products.[3] The addition of the filter, and an additional jumper, has necessarily increased the insertion loss of the

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[1] The Facility ID for K253BE at Iowa City, Iowa is 152186.
[2] The Facility ID for K292FZ at Iowa City, Iowa is 153604.
[3] Measurements following the installation of the bandpass filters confirm K253BE and K292FZ comply with the applicable sections of the Commission's Rules.

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system ahead of the antenna. As a result, KZIA seeks to modify the current license by increasing the specified transmitter power output to return to the authorized effective radiated power. No changes other than the change to the specified transmitter power are proposed under this application.

The transmitter power output specified in this application achieves the authorized effective radiated power. The antenna utilized by the facility is an ERI 100A-2F. Data from the manufacturer indicates that the power gain of this antenna is -0.4576 dB, which corresponds to an efficiency of 90.00 percent. The input power to the antenna to achieve the authorized effective radiated power is 277.8 Watts.

Ahead of the antenna is the run of transmission line, which consists of 285 feet of Andrew LDF7-50A coaxial cable. This particular style of transmission line has a nominal diameter of 1 5/8 inches, and is a foam-dielectric coaxial cable. Data from the manufacturer indicates an efficiency of 86.90 percent. The input power to the main run of transmission line to achieve the authorized effective radiated power is 319.7 Watts.

Between the input to the main transmission line run, and the output of the bandpass filter, is a jumper six feet in length. This jumper is comprised of Andrew FSJ4-50B, which is "superflexible" foam dielectric coaxial cable with a nominal diameter of 1/2 inch. The specified efficiency of this jumper is 97.88 percent based on manufacturer data. The input power to the jumper to achieve the authorized effective radiated power is 326.6 Watts.

Ahead of this jumper is a Shively three-cavity bandpass filter. The measured insertion loss of this filter is 0.571 dB.[4] This value corresponds to an efficiency of 87.68 percent. The input power to the bandpass filter to achieve the authorized effective radiated power is 372.5 Watts.

Between the bandpass filter and the transmitter is a second six-foot jumper identical to the previously described jumper. This second jumper also has an efficiency of 97.88 percent based on data from the manufacturer. The input power to this second jumper to achieve the authorized effective radiated power is 380.5 Watts, which rounds to 381 Watts. The input to this second jumper is the output of the transmitter. Thus, the transmitter power specified under this application achieves the authorized effective radiated power.

The proposed modification to the facility would not result in a significant environmental impact, and is exempt from environmental processing. The proposed change would simply increase the transmitter power so that the facility operates at the authorized effective radiated power. The facility would continue to comply with the Commission's RF exposure standards, and KZIA will coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standard.

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[4] Filter insertion loss was measured by the undersigned engineer through the use of a Rohde & Schwarz ZVL network analyzer calibrated on site according to the manufacturer's instructions, and operated in S21 mode.

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The preceding statement has been prepared by me, or under my direction, and is true and accurate to the best of my belief and knowledge.
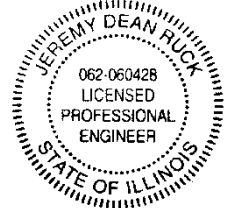
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License Expires November 30, 2017

Jeremy D. Ruck, PE
April 27, 2016

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