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**ENGINEERING EXHIBIT EE:**

**RADIO STATION KXRQ(FM)  
UINTA BROADCASTING, L.C.  
ROOSEVELT, UTAH**

**Ch. 234C2 50 KW 93 M HAAT**

**MARCH 30, 2004**

ENGINEERING STATEMENT IN SUPPORT OF  
AN APPLICATION FOR A  
ONE-STEP MODIFICATION  
CHANNEL 232C1 TO 234C2

File No. BLH-19990111KB - Facility ID: 83548

ATTACHED TO EXHIBIT 24 OF FCC FORM 301

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**RADIO STATION KXRQ(FM)  
UINTA BROADCASTING, L.C.  
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**TABLE OF CONTENTS:**

1. F.C.C. Form 301.
2. Declaration of Engineer
3. Narrative Statement
4. Figure 1, Topographic Map Showing Proposed Site.
5. Figure 2, Proposed Coverage Map.
6. Figure 3, Vertical Tower Sketch.
7. Figure 4, Channel Allocation.

## Declaration

I, John J. Mullaney, declare and state that I am a graduate electrical engineer with a B.E.E. and my qualifications are known to the Federal Communications Commission, and that I am an principal engineer in the firm of Mullaney Engineering, Inc., and that I have provided engineering services in the area of telecommunications since 1977. My qualifications as an expert in radio engineering are a matter of record with the Federal Communications Commission.

The firm of Mullaney Engineering, Inc., has been requested by Uinta Broadcasting, L.C., to prepare the instant engineering exhibit in support of an application for Construction Permit for a one-step modification of FM radio station KXRQ licensed to Roosevelt, Utah (FCC Facility ID Number: 83548).

All facts contained herein are true of my own knowledge except where stated to be on information or belief, and as to those facts, I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

/s/ John J. Mullaney  
John J. Mullaney, Consulting Engineer

Executed on the 30th day of March 2004.

**ENGINEERING EXHIBIT EE:**

**RADIO STATION KXRQ(FM)  
UINTA BROADCASTING, L.C.  
ROOSEVELT, UTAH**

**Ch. 234C2 50 KW 93 M HAAT**

**NARRATIVE STATEMENT:**

**I. General:**

This engineering statement has been prepared on behalf of Uinta Broadcasting, L.C., licensee of KXRQ(FM) on Ch. 232C1 at Roosevelt, Utah. The purpose of this statement is to request a Construction Permit authorizing a **one-step channel change** from 232C1 to 234C2. KXRQ proposes to operate from a new site on Channel 234C2 at Roosevelt, Utah, which will operate with an ERP of 50 KW and an HAAT of 93 Meters. Since the proposed site is properly spaced it will also be used as the one-step reference coordinates.

The application is not a major environmental action, as defined by Section 1.1307 of the Commission's Rules. The proposed facility is in full compliance with both the "controlled" & "un-controlled" FCC Radiation Guidelines.

Answers to questions contained in F.C.C. Form 301, are incorporated in the following paragraphs and figures.

## **II. Engineering Discussion:**

### **A. Proposed Location:**

KXRQ proposes to erect a new tower approximately 23 kilometers east of Roosevelt, UT. Figure 1 is a topographic map showing the proposed site. The NAD-27 geographic coordinates are:

Latitude: 40° 19' 55"

Longitude: 109° 42' 28"

The Regional Office of the FAA was **not** notified of this proposal since the "Towair" program indicates notification was **not** required. The tower is 200' AGL. As a result tower registration is **not** required.

### **B. Antenna System and Tower:**

A dual polarized 6-bay FM antenna will be side mounted near the top of a new tower. Figure 3 is a sketch of the proposed tower. The antenna has a non-directional power gain of 3.3 H/V.

### **C. Effective Radiated Power:**

Giving consideration for the maximum antenna gain, transmitter power and line loss, the maximum Effective Radiated Power is 50 KW for the Horizontal and 50 KW for the Vertical Component.

**D. Channel Allocation:**

Figure 4 is a channel allocation study from the proposed site. This application is in full compliance with Section 73.207(a). Since the proposed site is properly spaced it will also be used as the one-step reference coordinates and the entire city of Roosevelt is within the 33 km allotment arc used for Class C2 facilities..

**E. Terrain Profile Data & Coverage:**

Terrain profile data was extracted from the NGDC 30 Second Digitized Terrain Data Base provided out of Boulder, Colorado. At least twenty-four bearings (every 15 degrees) were used to obtain the proposed coverage data. The standard eight bearings (every 45 degrees) were used to obtain the proposed HAAT.

The predicted service contours, as shown in the attached report, were computed using a mathematical model adapted for computer use of data shown in Figure 1 of Section 73.333. This is the Commission's computer program TV FM FS REPORT RS-76-01, dated January 1976.

**F. Terrain Profile to City of License:**

The N-262-E radial is the direct path to the City of License. From the proposed site the 3.16 mV/M or 70 dBu City Grade Contour will completely encompass the City of License without major terrain obstruction.

**G. Coverage Area and Population:**

The area contained within the 60 dBu (1.0 mV/M) contour has been computed mathematically. The population within this contour was obtained through a computerized analysis of the census designated places population data contained in the 2000 census.

**H. FM Blanketing Contour:**

KXRQ recognizes its obligation to resolve related interference complaints for a one year period within its 115 dBu “FM Blanketing Contour” as required by Section 73.318 of the FCC Rules.

The radius around the base of the tower in which Blanketing interference is possible is fairly small (2 km) and is in a sparsely populated area. Given the height of the proposed antenna, no problems are anticipated.

**I. Other Services in Area:**

There are no known AM Broadcast Stations within 3.2 kilometers of the proposed site.

There are no known transmission facilities within 60 meters (197 feet) of the proposed antenna.

There are no other known FM or TV transmitters within 10 kilometers (6.2 miles) of the proposed site, however, based upon the type of transmitter proposed, and the frequency & power involved no intermodulation interference problems with existing transmitting facilities is expected. In the unlikely event some problems would occur, KXRQ will investigate and correct such cases in accordance with the Commission’s Rules.

**J. Environmental Assessment Statement:**

KXRQ believes its proposal will not significantly affect the environment since it does not meet any of the criteria specified in Section 1.1307 of the rules. Specifically the proposed facility:

- 1) Will NOT be located in an officially designated wilderness area.
- 2) Will NOT be located in an officially designated wildlife preserve.
- 3) Will NOT affect districts, sites, buildings, structures or objects, significant in American history, architecture, archeology or culture, that are listed in the National Register of Historic places or are eligible for such listing.
- 4) Will NOT be located in a floodplain.
- 5) Will NOT result in construction that will involve a significant change in the surface features (eg. wetland fill, deforestation or water diversion).
- 6) Will NOT involve the use of high intensity white lights on a structure located in a residential neighborhood, as defined by the applicable zoning laws.
- 7) Will NOT involve the exposure of workers or the general public to levels of Radio Frequency radiation in excess of the guidelines recommended by the FCC - OET Bulletin 65 (August 25, 1997).

The following is a more detailed discussion of this protection standard:

**A. National Environmental Policy Act of 1969:**

In 1969, Congress enacted the National Environmental Policy Act (NEPA), which requires the FCC to evaluate the potential environmental significance of the

facilities it regulates and authorizes. Human exposure to Radio Frequency (RF) radiation had been identified as an issue that the FCC must consider.

Beginning with the filing of applications after January 1, 1986, broadcast stations were required to “certify compliance” with FCC prescribed guidelines on human exposure to RF radiation. The FCC standard was based upon the American National Standards Institute’s (ANSI) RF radiation protection guides (ANSI C95.1-1982). These exposure limits are expressed in terms of milli-watts per square centimeter.

In October 1997, the FCC implemented a two tier evaluation criteria utilizing recommendations of the National Council on Radiation Protection and Measurement (NCRP). The “controlled” tier involves areas which have restricted access while the “un-controlled” tier involves areas which have unrestricted access. The Maximum Permissible Exposure (MPE) limits for “controlled” areas are the same as adopted in 1985, while the “un-controlled” limits for FM and TV frequencies are one-fifth or 20% of the limits for “controlled” areas.

These exposure limits are time-averaged over any six minute period and vary depending upon the frequency involved. The following are the Maximum Permissible Exposure (MPE) limits for “controlled” areas:

Frequency Range (MHz)	Power Density (mW/sq.cm)
*****	*****
0.3 to 3	100 AM
3 to 30	900/(Freq <sup>2</sup> )
30 to 300	1.0 VHF TV & FM
300 to 1,500	Freq/300 UHF TV
1500 to 100,000	5.0

KXRQ recognizes that compliance with the above criteria at sites involving multiple AM, FM and/or TV facilities is based upon the contributions of all such facilities. At the site discussed in this application, **the only significant facility** that will exist is the proposed FM facility.

### FM Broadcast Stations

For FM Broadcast Stations the following formula is used:

$$D = \frac{\text{SQRT}( F^2 * [HERP + VERP])}{1.667 * \text{SQRT}(PD) * 3.2808}$$

Where:

- D = the closest distance in meters that a human should come to an operating antenna (To obtain feet multiply by 3.2808)
- F = typical relative field factor in downward direction (F=1 is worst case main lobe)
- HERP = Horizontal ERP in watts (above a dipole)
- VERP = Vertical ERP in watts (above a dipole)
- PD = highest Power Density in milli-watts/cm<sup>2</sup>
- SQRT = Square Root
- Freq = Frequency in mega-cycles/sec. (MHz)

The vertical radiation pattern of the FM antenna specified in this application is narrow and, therefore, the power density as seen by an observer on the ground near the base of the tower will be less than 20 percent of the total ERP.

The application of the above equation (assuming maximum ERP), in our case, for a frequency of 94.7 MHz and an “un-controlled” Power Density of 0.2 milliwatts results in a minimum distance of 130 meters (425 feet) from the antenna. Inasmuch as the lowest element on the proposed antenna will be approximately 40.8 meters (134 feet) above the ground level **additional analysis is needed**. Using a form factor of  $F=0.30$  the contribution at ground level is 0.14 mW/sq.cm. We also ran the **FMMODEL** program using an ERI 6 bay (SHP-6AC) rototiller antenna and it indicated that the exposure at ground level never exceeds 0.100 mW/sq.cm. For FM, the “un-controlled” standard is 20% and, therefore, this proposal is in **full compliance** with both the controlled & un-controlled standards.

The tower will be surrounded by a **locked** fence to limit access.

Workers employed to climb the tower or work in a potential overexposure location will not be permitted to enter the work area until cleared by the station manager or other responsible person. Appropriate warning signs will be posted to ensure safety. In addition, KXRQ will establish and enforce work rules and safety procedures applicable in a potential over-exposure area. The rules will establish how close a worker can get to the antenna when it is operating at normal power and specify the power reduction required in order to make other locations safe. It is recognized that maintenance or installation work on or near the antenna may require the station to completely shutdown or switch temporarily to an auxiliary antenna or an auxiliary transmitter site. All employees, contract and other persons having access to areas of potential exposure will be required to sign a site management guide indicating they are aware of and will comply with all safety rules.

RADIO STATION KXRQ(FM)  
Ch. 234C2 - UINTA BROADCASTING, L.C.  
ONE-STEP 301 APP - MARCH 2004

**MULLANEY ENGINEERING, INC.**

**III. SUMMARY:**

Uinta Broadcasting, L.C., licensee of KXRQ at Roosevelt, UT, requests a Construction Permit authorizing a **one-step channel change** from 232C1 to 234C2. KXRQ proposes to operate from a new site on Channel 234C2 at Roosevelt, Utah, which will operate with an ERP of 50 KW and an HAAT of 93 Meters. Since the proposed site is properly spaced it will also be used as the one-step reference coordinates. This engineering proposal is in full compliance with the Commission's Rules.

/s/ John J. Mullaney

John J. Mullaney, Consulting Engineer

March 30, 2004.